Terminal Evaluations

Evaluation of GEF-Funded UNEP and UNDP Projects that Phased Out Ozone-Depleting Substances in Countries with Economies in Transition

March 2010

TouchDown Consulting sprl

Blank page for double-side printing

TITLE	Evaluation of GEF-Funded UNEP and UNDP Projects that Phased Out Ozone-Depleting Substances in Countries with Economies in Transition
SUB-TITLE	Terminal Evaluations
VERSION	Draft Final Report, Version 1.0
DATE	March 2010

CITATION FORMAT

Batchelor, T.A. and V. Smirnov. 2010. *Evaluation of GEF-Funded UNEP and UNDP Projects that Phased Out Ozone-Depleting Substances in Countries with Economies in Transition*. Terminal Evaluation. Report to the UNEP Evaluation and Oversight Unit, Nairobi. 31 March 2010. 749 pp.

SCOPE

This report is provided in response to requests to undertake:

- **Terminal Evaluations** of the *GEF Ozone Portfolio* for projects implemented by the United Nations Environment Programme (UNEP) and the United Nations Development Programme (UNDP) in Azerbaijan, Estonia, Kazakhstan, Latvia, Lithuania, Tajikistan, Turkmenistan and Uzbekistan;
- **Mid-Term Evaluation** of projects implemented in Armenia;
- **Terminal Evaluation** of the Regional Project "*Total Sector Methyl Bromide Phase Out in Countries with Economies in Transition*" for projects implemented by UNEP and UNDP in Bulgaria, Hungary, Latvia, Lithuania and Poland.

The sub-project reference numbers are shown in the Terms of Reference for the *GEF Ozone Portfolio* and the *Regional Project* in Annex 1 on page *687*.

ACKNOWLEDGEMENTS

The authors are very grateful for the useful information provided on these projects during meetings with many representatives in governments, international and national organisations, national ozone units, enterprises and consultants.

The opinions expressed in this report are those of the authors and are not necessarily those of any sponsoring or supporting organisation. Companies, associations or products are mentioned in this document for information purposes only. Mentioning them does not constitute a recommendation of any such company, association or product either expressly or implied.

COMMENTS

Dr Tom Batchelor
Director Touchdown Consulting
Brussels, Belgium

Email: tom.batchelor@skynet.be

For all aspects of the report including the country reports for Bulgaria, Estonia, Hungary, Kazakhstan, Latvia, Lithuania, Poland and Uzbekistan

Mr Valery Smirnov
Consultant
Montreal, Canada

Email: valery@smirnov.ca

For all aspects of the report including the country reports for Armenia, Azerbaijan, Tajikistan and Turkmenistan

Blank page for double-sided printing

Table of Contents

1 EXECUTIVE SUMMARY 11

2 CONCLUSIONS 13

3 RECOMMENDATIONS 19

4 LESSONS LEARNT 23

4.1 Government 23

4.2 Implementing Agencies 23

4.3 Projects 25

5 INTRODUCTION AND BACKGROUND 27

5.1 The Montreal Protocol 27

5.2 The Global Environment Facility 27

5.3 Controls on ozone-depleting substances 27

5.4 National implementation of projects 28

6 SCOPE, OBJECTIVES AND METHODS 31

6.1 Scope and objectives 31

6.2 Methods used in the evaluation 31

7 PROJECT PERFORMANCE AND IMPACT 33

7.1 Ozone-depleting substances phased out 33

7.2 Institutional strengthening 36

7.3 Recovery and recycling of ozone-depleting substances 39

7.4 Control of illegal trade in ozone-depleting substances 47

7.5 Investment in technology that eliminated ozone-depleting substances 55

8 PROJECT PERFORMANCE, IMPACT EVALUATIONS AND RATINGS 67

8.1 ARMENIA 69

8.2 AZERBAIJAN 133

8.3 BULGARIA 208

8.4 ESTONIA 235

8.5 HUNGARY 283

8.6 KAZAKHSTAN 306

8.7 LATVIA 380

8.8 LITHUANIA 443

8.9 POLAND 519

8.10 TAJIKISTAN 543

8.11 TURKMENISTAN 595

8.12 UZBEKISTAN 637

ANNEX 1: TERMS OF REFERENCE 687

ANNEX 2: EVALUATOR EXPERTISE 725

ANNEX 3: ASSIGNMENT OF RESPONSIBILITIES AND MISSION SCHEDULE 727

ANNEX 4: DOCUMENTS REVIEWED 729

ANNEX 5: INTERVIEWEES 741

TABLES

TABLE 1: INSTITUTIONAL STRENGTHENING OF THE NOU AS MEASURED BY ACTIVITIES ON LEGISLATIVE MEASURES, RATIFICATIONS, AND COOPERATION WITH CUSTOMS INCLUDING TRAINING 36

TABLE 2: OZONE-DEPLETING SUBSTANCES RECOVERED IN ARMENIA, ESTONIA, LATVIA, LITHUANIA, TAJIKISTAN AND UZBEKISTAN IN 2007 (KG) 43

TABLE 3: RECOVERY AND RECYCLING OF OZONE-DEPLETING SUBSTANCES SHOWN ACCORDING TO LEGISLATION, TRAINING IN BEST-PRACTICE MANAGEMENT OF THE PHASE OUT OF OZONE-DEPLETING SUBSTANCES, QUALIFICATIONS, EQUIPMENT, HALON RECOVERY, ORGANISATIONS THAT ASSISTED IN ODS, AND REPORTING 45

TABLE 4: EXAMPLES OF ILLEGAL OZONE-DEPLETING SUBSTANCE TRADE REPORTED IN CEITs SINCE 2002 49

TABLE 5: RISK OF ILLEGAL TRADE IN OZONE-DEPLETING SUBSTANCE AFTER 2010 51

TABLE 6: PROSPECTS OF ILLEGAL TRADE IN OZONE-DEPLETING SUBSTANCES BASED ON AN ANALYSIS OF THE NUMBER OF CUSTOMS OFFICERS TRAINED, ILLEGAL IMPORTS AND ESTABLISHED PENALTIES 53

TABLE 7: UNDP PROJECTS THAT SUPPLIED TECHNOLOGY THAT AIMED TO ELIMINATE THE USE OF OZONE-DEPLETING SUBSTANCES 65

TABLE 8: SUB-PROJECTS THAT CONTRIBUTED TO THE PHASE-OUT OF OZONE-DEPLETING SUBSTANCES IN ARMENIA THAT ARE ONGOING (O) OR COMPLETED (C) 70

TABLE 9: OBJECTIVES/ INTENDED RESULTS - OUTPUTS/ACTIVITIES/DELIVERABLES - OUTCOMES/PERFORMANCE INDICATORS 72

TABLE 10: RATINGS FOR THE INSTITUTIONAL STRENGTHENING PROJECT IN ARMENIA 92

TABLE 11: ODS RECOVERY AND RECYCLING PROJECT IN ARMENIA: OBJECTIVES/ INTENDED RESULTS - OUTPUTS/DELIVERABLES - OUTCOMES/PERFORMANCE INDICATORS 95

TABLE 12: QUANTITIES OF RECOVERED AND RECYCLED REFRIGERANTS IN ARMENIA FROM 2006 TO 2008 (KG) 97

TABLE 13: AVERAGE PRICES OF REFRIGERANTS IN ARMENIA FROM 2006 TO 2008 98

TABLE 14: RATINGS FOR THE PROJECT ON ODS RECOVERY AND RECYCLING IN ARMENIA 104

TABLE 15: AWARENESS, FINANCIAL INCENTIVE AND RETROFIT PROJECT IN ARMENIA: OBJECTIVES/ INTENDED RESULTS - OUTPUTS/DELIVERABLES - OUTCOMES/PERFORMANCE INDICATORS 107

TABLE 16: RATINGS FOR FINANCIAL INCENTIVE AND RETROFIT PROJECT IN ARMENIA 114

TABLE 17: PHASE OUT OF CFCs IN MANUFACTURING OF DOMESTIC REFRIGERATORS AT SAGA: OBJECTIVES/ INTENDED RESULTS - OUTPUTS/DELIVERABLES - OUTCOMES/PERFORMANCE INDICATORS 117

TABLE 18: RATINGS FOR THE DOMESTIC REFRIGERATOR PRODUCTION PROJECT AT SAGA IN ARMENIA 122

TABLE 19: PHASE OUT OF CFCs OUT OF CFCs IN THE PRODUCTION OF AEROSOLS AT YEREVAN HOUSEHOLD CHEMISTRY PLANT: OBJECTIVES/ INTENDED RESULTS - OUTPUTS/DELIVERABLES - OUTCOMES/PERFORMANCE INDICATORS 125

TABLE 20: RATINGS FOR THE YEREVAN AEROSOL PROJECT IN ARMENIA 130

TABLE 21: SUB-PROJECTS THAT CONTRIBUTED TO THE PHASE-OUT OF OZONE-DEPLETING SUBSTANCES IN AZERBAIJAN 134

TABLE 22: AZERBAIJAN INSTITUTIONAL STRENGTHENING PROJECT - OBJECTIVES/ INTENDED RESULTS - OUTPUTS/DELIVERABLES – OUTCOMES AND PERFORMANCE INDICATORS 136

TABLE 23: PROJECT RATINGS FOR THE INSTITUTIONAL STRENGTHENING PROJECT IN AZERBAIJAN 153

TABLE 24: AZERBAIJAN TRAINING PROJECT - OBJECTIVES/ INTENDED RESULTS - OUTPUTS/DELIVERABLES - OUTCOMES/PERFORMANCE INDICATORS 156

TABLE 25: PROJECT RATINGS FOR THE TRAINING PROJECT IN AZERBAIJAN 163

TABLE 26: AZERBAIJAN ODS RECOVERY AND RECYCLING PROJECT - OBJECTIVES/ INTENDED RESULTS - OUTPUTS/DELIVERABLES - OUTCOMES/PERFORMANCE INDICATORS 166
TABLE 27: AZERBAIJAN RECOVERY AND RECYCLING PROJECT RATINGS 174
TABLE 28: PHASE OUT OF CFCs IN MANUFACTURING OF DOMESTIC REFRIGERATORS AT CHINAR: OBJECTIVES/ INTENDED RESULTS - OUTPUTS/DELIVERABLES - OUTCOMES/PERFORMANCE INDICATORS 178
TABLE 29: PROJECT RATINGS FOR AZERBAIJAN DOMESTIC REFRIGERATOR PRODUCTION 184
TABLE 30: CONVERSION OF COMPRESSOR MANUFACTURING FACILITY IN SUMGAYIT: OBJECTIVES/ INTENDED RESULTS - OUTPUTS/DELIVERABLES - OUTCOMES/PERFORMANCE INDICATORS 188
TABLE 31: PROJECT RATINGS FOR COMPRESSOR PRODUCTION IN AZERBAIJAN 194
TABLE 32: HALON MANAGEMENT AND BANKING NATIONAL RECOVERY/RECYCLING CENTRE: OBJECTIVES/ INTENDED RESULTS - OUTPUTS/DELIVERABLES - OUTCOMES/PERFORMANCE INDICATORS 198
TABLE 33: PROJECT RATINGS FOR THE HALON PROJECT IN AZERBAIJAN 205
TABLE 34: LEGISLATION ON OZONE-DEPLETING SUBSTANCES IN BULGARIA 219
TABLE 35: UNEP-DESIGNED “OUTPUTS” AND “INDICATORS” THAT WERE USED TO MONITOR PROGRESS AND EVALUATE SUCCESS IN THE METHYL BROMIDE PHASE OUT PROJECT IMPLEMENTED IN BULGARIA 224
TABLE 36: LEGISLATION ON OZONE-DEPLETING SUBSTANCES (INCLUDING METHYL BROMIDE) IN BULGARIA THAT WAS IN FORCE PRIOR TO THE START OF THE PROJECT 228
TABLE 37: GENERALISED OBJECTIVES, OUTPUTS AND OUTCOMES THAT WERE USED AS A GUIDE IN THE ASSESSMENT OF EACH SUB-PROJECT 236
TABLE 38: OZONE DEPLETING SUBSTANCES RECOVERED AND RECYCLED IN ESTONIA FROM 2003 UNTIL 2006 (KG) 266
TABLE 39: HALON RECOVERED AND RECYCLED IN ESTONIA FROM 2002 UNTIL 2008 273
TABLE 40: UNEP-DESIGNED “OUTPUTS” AND “INDICATORS” THAT WERE USED TO MONITOR PROGRESS AND EVALUATE SUCCESS IN THE METHYL BROMIDE PHASE OUT PROJECT IMPLEMENTED IN BULGARIA 297
TABLE 41: GENERALISED OBJECTIVES, OUTPUTS AND OUTCOMES THAT WERE USED AS A GUIDE IN THE ASSESSMENT OF EACH SUB-PROJECT 308
TABLE 42: SUMMARY OF ALLOCATION OF FUNDS TO EACH OF THE SUB-PROJECTS THAT PHASED OUT OZONE-DEPLETING SUBSTANCES IN KAZAKHASTAN 311
TABLE 43: LEGISLATION IN KAZAKHSTAN REGULATING THE PRODUCTION, CONSUMPTION, EXPORT AND IMPORT OF OZONE-DEPLETING SUBSTANCES 318
TABLE 44: ESTIMATED RECOVERY OF ODS FROM VARIOUS SECTORS OVER A 3 YEAR PERIOD IN KAZAKHSTAN 335
TABLE 45: GENERALISED OBJECTIVES, OUTPUTS AND OUTCOMES THAT WERE USED AS A GUIDE IN THE ASSESSMENT OF EACH SUB-PROJECT 382
TABLE 46: SUMMARY OF BUDGET AND EXPENDITURE IN LATVIA PROGRAMME 384
TABLE 47: UNEP-DESIGNED “OUTPUTS” AND “INDICATORS” THAT WERE USED TO MONITOR PROGRESS AND EVALUATE SUCCESS IN THE METHYL BROMIDE PHASE OUT PROJECT IMPLEMENTED IN BULGARIA 435
TABLE 48: GENERALISED OBJECTIVES, OUTPUTS AND OUTCOMES THAT WERE USED AS A GUIDE IN THE ASSESSMENT OF EACH SUB-PROJECT 444
TABLE 49: SUMMARY OF GEF PROGRAMME DURATION, ODP TONNE TARGET AND BUDGET IN LITHUANIA 447
TABLE 50: QUANTITIES OF ODS RECOVERED AND RECYCLED IN LITHUANIA IN 2000, 2005, 2006 AND 2007 (KG) 464
TABLE 51: UNEP-DESIGNED “OUTPUTS” AND “INDICATORS” THAT WERE USED TO MONITOR PROGRESS AND EVALUATE SUCCESS IN THE METHYL BROMIDE PHASE OUT PROJECT IMPLEMENTED IN BULGARIA 509

TABLE 52: UNEP-DESIGNED "OUTPUTS" AND "INDICATORS" THAT WERE USED TO MONITOR PROGRESS AND EVALUATE SUCCESS IN THE METHYL BROMIDE PHASE OUT PROJECT IMPLEMENTED IN BULGARIA 533
TABLE 53: SUB-PROJECTS AND ASSOCIATED COSTS 544
TABLE 54: TAJIKISTAN OBJECTIVES/ INTENDED RESULTS - OUTPUTS/DELIVERABLES - OUTCOMES/PERFORMANCE INDICATORS 545
TABLE 55: THE MARKET PRICE OF CFC-12 AND HFC-134A IN TAJIKISTAN (US$) 550
TABLE 56: PROJECT RATINGS FOR THE INSTITUTIONAL STRENGTHENING PROJECT IN TAJIKISTAN 561
TABLE 57: OBJECTIVES/ INTENDED RESULTS - OUTPUTS/DELIVERABLES - OUTCOMES/PERFORMANCE INDICATORS 564
TABLE 58: RATINGS FOR THE TRAINING PROJECT IN TAJIKISTAN 572
TABLE 59: TAJIKISTAN ODS RECOVERY AND RECYCLING PROJECT - OBJECTIVES/ INTENDED RESULTS - OUTPUTS/DELIVERABLES - OUTCOMES/PERFORMANCE INDICATORS 575
TABLE 60: RECOVERED AND RECYCLED REFRIGERANTS IN TAJIKISTAN FROM 2001 TO 2008 (KG) 577
TABLE 61: RATINGS FOR THE ODS RECOVERY AND RECYCLING PROJECT IN TAJIKISTAN 583
TABLE 62: PHASE OUT OF CFCs IN MANUFACTURING OF DOMESTIC REFRIGERATORS AT PAMIR: OBJECTIVES/ INTENDED RESULTS - OUTPUTS/DELIVERABLES - OUTCOMES/PERFORMANCE INDICATORS 586
TABLE 63: RATINGS FOR THE DOMESTIC REFRIGERATOR PROJECT IN TAJIKISTAN 592
TABLE 64: SUB-PROJECTS THAT CONTRIBUTED TO THE ODS PHASE-OUT IN TURKMENISTAN THAT HAVE BEEN COMPLETED 596
TABLE 65: TURKMENISTAN OBJECTIVES/ INTENDED RESULTS - OUTPUTS/ACTIVITIES/DELIVERABLES - OUTCOMES/PERFORMANCE INDICATORS 597
TABLE 66: RATINGS FOR THE INSTITUTIONAL STRENGTHENING PROJECT IN TURKMENISTAN 612
TABLE 67: TURKMENISTAN TRAINING OBJECTIVES/INTENDED RESULTS - OUTPUTS/DELIVERABLES - OUTCOMES/PERFORMANCE INDICATORS 615
TABLE 68: RATINGS FOR THE TRAINING PROJECT IN TURKMENISTAN 622
TABLE 69: ODS RECOVERY AND RECYCLING PROGRAMME: OBJECTIVES/ INTENDED RESULTS - OUTPUTS/DELIVERABLES - OUTCOMES/PERFORMANCE INDICATORS 626
TABLE 70: QUANTITY OF RECOVERED AND RECYCLED CFC-12 (APRIL 2000 –NOVEMBER 2002) IN TURKMENISTAN 628
TABLE 71: RATINGS FOR THE ODS RECOVERY AND RECYCLING PROJECT IN TURKMENISTAN 633
TABLE 72: GENERALISED OBJECTIVES, OUTPUTS AND OUTCOMES THAT WERE USED AS A GUIDE IN THE ASSESSMENT OF EACH SUB-PROJECT 638
TABLE 73: GEF-FUNDED PROJECTS IN UZBEKISTAN THAT TARGETED THE REDUCTION AND PHASE OUT OF OZONE-DEPLETING SUBSTANCES 641
TABLE 74: LEGISLATION ADOPTED IN UZBEKISTAN ON OZONE-DEPLETING SUBSTANCES 647
TABLE 75: THE NUMBER OF REFRIGERATORS AND MODELS PRODUCED FROM 2003 TO 2008 BY SINO 681
TABLE 76: COMPARISON OF PLANNED VERSUS ACTUAL FOR THE PHASES OF IMPLEMENTATION OF CFC-FREE TECHNOLOGY AT THE SINO DOMESTIC REFRIGERATOR PRODUCTION FACILITY IN UZBEKISTAN 683

FIGURES

FIGURE 1: IMPACT OF PROJECTS TO PHASE OUT THE CONSUMPTION OF OZONE-DEPLETING SUBSTANCES (CFCs AND HALON) IN NINE CEITs 34

FIGURE 2: REDUCTION IN METHYL BROMIDE CONSUMPTION IN BULGARIA, HUNGARY, LATVIA, LITHUANIA AND POLAND DURING THE PERIOD OF THE PROJECT (A) AND ITS EXTENSION (B) 35

FIGURE 3: NUMBER OF TECHNICIANS TRAINED IN BEST-PRACTICE MANAGEMENT OF OZONE-DEPLETING SUBSTANCES DURING THE PROJECT 41

FIGURE 4: NUMBER OF PUMPS, RECOVERY MACHINES, RECOVERY AND RECYCLING MACHINES AND RECLAMATION MACHINES PROVIDED DURING THE PROJECT 42

FIGURE 5: NUMBER OF CUSTOMS OFFICERS TRAINED IN NON-EU-CEITs (RED) COMPARED TO EU-CEITs 48

FIGURE 6: THE NOU IN RELATION TO OTHER GOVERNMENT DEPARTMENTS IN ARMENIA 78

FIGURE 7: MONTREAL PROTOCOL BENCHMARKS AND ACTUAL CFC CONSUMPTION IN ARMENIA 83

FIGURE 8: NEW COPELAND R-22 CONDENSING UNIT AT DAROINK 109

FIGURE 9: NEW DANFOSS R-404 COMPRESSOR AT LINDA LTD 109

FIGURE 10: CANNON 80 FOAM DISPENSER AT SAGA LTD 118

FIGURE 11: COSTER GASSING AND CRIMPING UNIT AT YHCP 126

FIGURE 12: HOUSEHOLD CHEMICAL PRODUCTS MADE AT YHCP 128

FIGURE 13: COUNTRY PROGRAMME BENCHMARKS AND ACTUAL CFC CONSUMPTION IN AZERBAIJAN 147

FIGURE 14: CANNON CABINET FOAMING JIGS 179

FIGURE 15: CANNON DRUM FOAMING UNIT 179

FIGURE 16: CYCLOPENTANE TANK 180

FIGURE 17: ROTARY SPADERS FOR INJECTING NEMATOCIDE IN SOIL YANDI COMPANY, BULGARIA 220

FIGURE 18: FOGGING MACHINE THAT RELEASES PESTICIDE IN FLOUR MILLS YANDI COMPANY, BULGARIA 221

FIGURE 19: SPEEDBOX FOR RAPIDLY RELEASING PHOSPHINE PESTICIDE INTO FLOUR MILLS YANDI COMPANY, BULGARIA 221

FIGURE 20: OVERALL IMPLEMENTATION AND COORDINATION ARRANGEMENTS FOR THE UNEP/UNDP/GEF PROJECT 224

FIGURE 21: ESTONIAN ENVIRONMENT RESEARCH CENTRE IN TALLINN 242

FIGURE 22: HALON DECOMMISSIONED FROM SHIPS USING TRUCK AND SMALL CRANE, WITH STORAGE TANKS IN BACKGROUND HALON BANK, ESTONIA 274

FIGURE 23: ROTARY SPADER ADAPTED FOR USE IN GLASSHOUSES WITH NEMATOCIDE AS LIQUID (FRONT TANKS) OR GRANULES (RED REAR TANKS) ZEPHYR , HUNGARY 293

FIGURE 24: SWEET PEPPERS AND TOMATOES GROWN IN ROCKWOOL SOILLESS MEDIA WITHOUT METHYL BROMIDE ARPAD, HUNGARY 294

FIGURE 25: INSECT PREDATORS REPLACE PESTICIDES (LEFT) IN LARGE GLASSHOUSES (RIGHT) ARPAD, HUNGARY 294

FIGURE 26: SMALLER CYLINDERS AND EQUIPMENT (BLUE) USED FOR ODS RECOVERY AND STORAGE (LEFT) WITH UNUSED LARGE TANK (RIGHT) POLAIR, KAZAKHSTAN 323

FIGURE 27: ODS RECOVERY EQUIPMENT FROM MOBILE AIR CONDITIONING AUTO KLIMAT, KAZAKHSTAN 324

FIGURE 28: CYLINDERS OF HALON AT THE POLYGON RESEARCH CENTRE, KAZAKHSTAN 371

FIGURE 29: LITTLE-USED HALON RECOVERY AND RECLAMATION EQUIPMENT POLYGON RESEARCH CENTRE, KAZAKHSTAN 371

FIGURE 30: RTI RECOVERY AND RECYCLE EQUIPMENT (LEFT) AND STORED ODS (RIGHT) REVERS REFRIGERATION, LATVIA 402

FIGURE 31: ACTUAL COST-EFFECTIVENESS OF MLF-FINANCED AEROSOL PROJECTS IN DEVELOPING COUNTRIES THAT WERE COMPLETED OR APPROVED BEFORE JULY 2002 410

FIGURE 32: AEROSOL MANUFACTURING FACILITY (TOP) AND PROPANE-BUTANE TANKS (BELOW) KVADRO AEROSOLS, LATVIA 410
FIGURE 33: REPLACEMENT OF CFCs WITH HYDROCARBON TECHNOLOGY FOR THE PRODUCTION OF HOUSEHOLD AEROSOLS, AND IMPACT ON PRODUCTION 412
FIGURE 34: NUMBER OF AEROSOL CANS MANUFACTURED WITH CFCs (1993 TO 1996, BY VILNIUS BUITINE CHEMIJA) AND WITH HYDROCARBON PROPELLANT (2005 TO 2006, BY AEROSOL BALTIJA) 474
FIGURE 35: NUMBER OF REFRIGERATORS PRODUCED BY SNAIGĖ USING CFC-11, CFC-12, HCFC-141B, CYCLOPENTANE, HFC-134A AND R600A (IN TONNES) IN EACH YEAR FROM 1993 UNTIL 2008 483
FIGURE 36: SPADER SHOWING NEMATOCIDE BINS (RED), AND DETAILS OF SPADES THAT ARE DAMAGED BY ROCKS IN SOIL SOLFUM, POLAND 530
FIGURE 37: COCOON FOR CREATING LOW OXYGEN ENVIRONMENT TO KILL PESTS ON SEEDS PNOS SEED COMPANY, POLAND 531
FIGURE 38: COCOON FOR CREATING LOW OXYGEN ENVIRONMENT TO KILL PESTS ON SEEDS, WITH DAMAGED ZIPPER PNOS SEED COMPANY, POLAND 531
FIGURE 39: GOVERNMENT STRUCTURE IN TAJIKISTAN FOR THE IMPLEMENTATION OF THE MONTREAL PROTOCOL 559
FIGURE 40: RECYCLING CENTRE IN DUSHANBE 576
FIGURE 41: QUANTITIES IN TAJIKISTAN OF IMPORTED AND RECOVERED CFC-12 AND HCFC-22 578
FIGURE 42: PRODUCTION OF DOMESTIC REFRIGERATORS AT PAMIR, WITH THE REPLACEMENT OF CFC-12 BY HFC-134A REFRIGERANT 588
FIGURE 43: ASSEMBLY WORKSHOP AT PAMIR IN MARCH 2009 588
FIGURE 44: DISMANTLED GALILEO CHARGING EQUIPMENT AT THE PAMIR FACILITY 589
FIGURE 45: PLANNED REDUCTION OF ODS ACCORDING TO TURKMENISTAN'S COUNTRY PROGRAMME (RED) AND ODS CONSUMPTION REPORTED TO THE OZONE SECRETARIAT (GREEN) 605
FIGURE 46: RECOVERY AND RECYCLING CENTRE IN TURKMENISTAN 627
FIGURE 47: TRAINING ROOM (TOP), DEMONSTRATION AIR CONDITIONING CHILLER (MIDDLE) AND GAS CHROMATOGRAPH (BOTTOM) TASHKENT STATE TECHNICAL UNIVERSITY, UZBEKISTAN 658
FIGURE 48: REFRIGERATION UNIT FROM A REFRIGERATED RAILWAY WAGON *YO'L REFTRANS, UZBEKISTAN* 670
FIGURE 49: REFRIGERATED RAILWAY WAGON *YO'L REFTRANS, UZBEKISTAN* 671
FIGURE 50: ODS RECLAMATION EQUIPMENT AND STORAGE CYLINDERS (ABOVE), AND RECOVERY EQUIPMENT (BELOW) SHARK SHABODA, UZBEKISTAN 671
FIGURE 51: CFC-12 COMPRESSOR FROM CHINA *SAVODO TEKNIKA, UZBEKISTAN* 672
FIGURE 52: TOTAL QUANTITIES OF CFC-12, HCFC-22, M1LE AND HFC-134A RECOVERED IN UZBEKISTAN 673
FIGURE 53: TEMPLATE UNIT FOR CUTTING OUT DOOR LINING (LEFT), WELDING COMPRESSOR CIRCUIT TO COMPRESSOR (RIGHT), AND FINISHED REFRIGERATORS (BELOW) SINO, UZBEKISTAN 680

ACRONYMS

3R	Refrigerant recovery and recycling programme
A2	Article 2 Party of the Montreal Protocol, Non-Article 5 Party, industrialised country
A5	Article 5 Party of the Montreal Protocol, developing country
CEIT	Country with Economy in Transition; plural CEITs
CFCs	Chlorofluorocarbons (ODS controlled by the Montreal Protocol)
CIS	Commonwealth of Independent States, a regional organization whose participating countries are former Soviet Republics.
Consumption	As defined under the Montreal Protocol, ODS consumption = production + imports – exports
CTC	Carbon tetrachloride (ODS controlled by the Montreal Protocol)
GDP	Gross Domestic Product (as a measure of the economy)
EUEs	Essential use exemptions, mainly relating to CFCs
F-gases	Fluorinated gases: HFCs, PFCs, SF_6 (greenhouse gases controlled by the Kyoto Protocol)
GEF	Global Environment Facility
GHG	Greenhouse gas
GWP	Global Warming Potential
HFCs	Hydrofluorocarbons (F-gases, greenhouse gases controlled by the Kyoto Protocol)
HCFCs	Hydrochlorofluorocarbons (ODS controlled by the Montreal Protocol)
IPCC	Intergovernmental Panel on Climate Change of WMO and UNEP (UNFCCC)
IPM	Integrated Pest Management, which is the minimal to no use of pesticides in food production
MB	Methyl bromide, a pesticide used for killing soil pests and pests in food facilities
MCF	Methyl chloroform, also known as 1,1,1-trichloroethane or TCE (ODS controlled by the Montreal Protocol)
MLF	Multilateral Fund of the Montreal Protocol
Mt CO_2eq	Million tonnes carbon dioxide equivalent
NOU	National Ozone Unit
ODP	Ozone Depletion Potential, an index of a molecule's impact on ozone in the ozone layer
ODP-tonnes	Tonnes weighted by a chemical's ozone depletion potential
ODS	Ozone-depleting substance
QPS	Quarantine and pre-shipment uses of methyl bromide
$	United States dollar used throughout the report
t	Tonnes
tCO_2eq	Tonnes carbon dioxide equivalent
TEAP	Technology and Economic Assessment Panel of the Montreal Protocol
UNDP	United Nations Development Programme
UNEP	United Nations Environment Programme
UNFCCC	United Nations Framework Convention on Climate Change
WMO	World Meteorological Organization

Blank page for double-sided printing

1 Executive Summary

1. Ozone-depleting substances from man-made sources are highly stable compounds that were once used widely throughout modern society, especially for refrigeration and air-conditioning uses. When inadvertently emitted to the atmosphere they deplete the ozone layer and increase highly damaging UV radiation reaching the Earth, which causes health and environmental problems. The impact on human health and crop production as a result of a damaged ozone layer led to the adoption of the Vienna Convention and subsequently the Montreal Protocol. In 2009 the Montreal Protocol became the first treaty to achieve universal ratification.
2. Countries with Economies in Transition (CEITs) are categorised as developed countries in the Montreal Protocol, which makes them ineligible for from the Multilateral Fund (MLF) which provides financial assistance to developing countries. The Global Environment Facility (GEF) is another financial mechanism which was launched in 1991 to assist developing countries and CEITs to meet their international commitments to environmental treaties including the Montreal Protocol.
3. The most destructive ozone depleting substances are chlorofluorocarbons (CFCs) and halons. CFCs were widely used as refrigerants in refrigeration and air-conditioning equipment, as blowing agents in foams, as propellants in aerosols, and also as solvents and cleaning agents. Halons are used in fire-extinguishers and in fire fighting systems. In the early 1990s, methyl bromide was also added to the Montreal Protocol as an ozone-depleting substance. It was used mainly as an agricultural fumigant to kill mainly nematode pests in soil before planting high-value crops, and to kill mainly insect pests in food facilities and flour mills.
4. The Montreal Protocol sets a timetable for phasing-out ozone-depleting substances listed in its Annexes and requires Parties to annually report on the production and consumption of them. Each year the Parties meet to agree on further national actions that should be taken to protect the ozone layer. On average every 5 years, the Parties have agreed amendments to the phase out schedules that have accelerated the reduction and phase out of whole classes of ozone-depleting substances that are controlled by the Montreal Protocol. Once a new amendment has been agreed, a developing or CEIT normally prepares or updates their Country Programme as this sets out the commitment by the government to take appropriate actions to ensure compliance with the Protocol.
5. The Country Programme provides the basis for the Protocol's implementation agencies to design a Project Document. This specifies activities and estimated costs that are required to address any deficiencies in the Country Programme that cannot be met financially or technically by the national government. UNEP and UNDP were partner agencies in both the *Ozone-Depleting Substances Portfolio* and the *Methyl Bromide Regional Project* in this evaluation report. UNEP as an Implementing Agency specialises in strengthening the institutional capacity of the country (e.g., awareness raising, training, development of policies and measures). UNDP as an Implementing Agency focuses on '*investment*' activities that substitute ODS-dependent with ODS-free technology.
6. Within each country, the National Ozone Unit (NOU) was responsible for the implementation of the project in accordance with the objectives and activities outlined in the Project Document. Most activities in the sub-projects that involved UNEP were to be completed within 3 years. These involved *Institutional Strengthening* which aimed to improve the expertise and operational competency of staff in the NOU and other relevant organisations, *training of refrigeration technicians* in best-practice management of ozone-depleting substances, and

training of Customs officials in the identification of ozone-depleting substances and illegal imports. UNDP was responsible for the investment sub-projects in the CEITs, which include aerosol, foam, solvent, refrigeration manufacturing and refrigerant and halon recovery/recycling and agricultural projects. UNDP was responsible for procuring equipment, installing it, on-the-job training, testing and trials, and commissioning the equipment.

7. The *Ozone-Depleting Substances Portfolio* aimed to phase-out of ozone-depleting substances in nine CEITs. It comprised 42 sub-projects in the refrigeration and air-conditioning, foam blowing, solvent, aerosol and fire-fighting sectors. The nine CEITs involved in this project were Armenia, Azerbaijan, Estonia, Kazakhstan, Latvia, Lithuania, Tajikistan, Turkmenistan and Uzbekistan. Seven of these countries are classified as developed in the Montreal Protocol and required to phase out ozone-depleting substances earlier than Turkmenistan[1] and Armenia[2] which are classified as developing countries.

8. The *Methyl Bromide Regional Project* aimed to phase-out of all uses of methyl bromide except that used for quarantine and pre-shipment (QPS) in five CEITs: Bulgaria, Hungary, Latvia, Lithuania, Poland. All of these CEITS were members of the EU at the time the project commenced in September 2004, except for Bulgaria that acceded to the EU on 1 January 2007.

9. The projects in all countries were subject to a Terminal Evaluation, except for Armenia which was a Mid-Term Evaluation. These evaluations determined the extent to which the sub-project's objectives had been achieved, or are expected to be achieved, and assessed any other positive or negative impact of the projects. Where possible the extent and magnitude of the impact of the sub-project was documented and the likelihood of future impacts determined. The Mid-Term and Terminal Evaluations assessed the performance of each sub-project and the implementation of the project activities and planned outputs against actual results achieved.

10. The Evaluation used a combination of approaches to assess the impact of the sub-project from several perspectives, using a mix of quantitative and qualitative methods of data collection and analysis: Desk reviews, face-to-face meetings, and follow-up with key stakeholders as necessary. The desk review included a review of the project documents, outputs, monitoring reports, Steering Group meetings and other documents relevant to the projects. Sources of information were listed in a separate annex and also used as footnotes to the relevant part of the text. Face-to-face meetings were held with the NOUs in each country except Lithuania where the NOU had a preference for supplying the information for the report by email. Interviews and telephone interviews were held with stakeholders involved in the sub-projects. Additional information and opinions were obtained from representatives of the GEF, UNEP, UNDP and the MLF that had experience in these or similar projects. A questionnaire survey was sent to the NOUs for responses to validate and confirm key issues arising out of the qualitative data collection.

11. The project performance and impact *for each project* (*vertical assessment*) was transcribed into a template provided by UNEP and shown in Section 8: PROJECT PERFORMANCE, IMPACT EVALUATIONS AND RATINGS. Based on the information in Section 8, the project performance and impact was assessed across the *ODS Portfolio* and the *Methyl Bromide Regional Project* in several key areas (*horizontal assessment)* in the following areas that are important for the phase out of ozone-depleting substances:

- The extent of the phase out of ozone-depleting substances;
- Institutional strengthening;
- Recovery and recycling of ODS;
- Control of illegal trade;
- Investments in technology that eliminated ozone-depleting substances.

The PROJECT PERFORMANCE AND IMPACT is summarised in Section 7.

12. In this report Bulgaria, Estonia, Hungary, Latvia, Lithuania, Poland were called *EU-CEITs* as they had many features in common when implementing projects. The other countries mentioned above that were not in this list were called *Non-EU-CEITs* as they were also characterised by common features.

---

[1] Turkmenistan began the project as a developed CEIT. In 2004, Turkmenistan changed its status to a developing CEIT (Dec XVI/39).

[2] Armenia began the project as a developed CEIT. In 2002, Armenia changed its status to a developing CEIT (Dec XIV/2).

2 Conclusions

Conclusion 1: ***GEF support for the phase out of consumption and production of ozone-depleting substances in countries with economies in transition has contributed to global environmental benefits***

13. The CEITs in the *Ozone-Depleting Substances Portfolio* had a consumption of almost 18,000 ODP-tonnes of ozone-depleting substances in 1986, which was about one percent of the global consumption at that time. Much of this consumption was reduced significantly in the early 1990s because of the poor economic conditions following independence from the Soviet Union and the introduction of free market economies. GEF funding was provided at the time CEIT economies were recovering in the mid-1990s and aimed to prevent a return to '*business as usual*' with regard to use of ODS.

14. The GEF financing of the non-investment activities was important for the development and implementation of policy and legislation to phase out consumption and promote ODS-free alternatives; government institutional capacity to manage the ODS phase-out; government customs and border security measures to curtail illegal trade in ODS; and the implementation of ODS recovery, recycle and reclamation programmes that allowed servicing of existing equipment without imported ODS.

15. The government commitment to the ODS phase out was in general better in EU-CEITs than Non-EU-CEITs. The commitment by EU-CEITs was largely driven by EU accession which required them to harmonise national legislation on ODS with more stringent EU legislation. It also contributed to regular updates of legislation and policy on ODS reduction and phase out, compelled reporting on many aspects of the ODS phase out, and vigilance on illegal trade in ODS. By contrast, the government commitment in Non-EU-CEITs was much weaker as shown by the lack of ratification of key amendments to the Montreal Protocol, lack of centralised budget funding for NOUs, and insufficient legislation and policies to restrict ODS and to promote alternatives. In these countries, illegal trade in ODS undermined their ODS reductions and is a significant challenge to phase-out.

16. The GEF financing of investment activities resulted in a commitment from the industry to the phase out of ozone-depleting substances. The GEF budgeted about $2.5 million to fund the transition to ODS-free technology in 19 investment projects in diverse sectors: refrigeration production, foam, aerosol, solvent, refrigeration & air conditioning servicing, and agriculture. This funding provided for important technological and production changes which enabled enterprises to comply with the Montreal Protocol and to maintain and / or gain market share and thus make profits. Of the 19 enterprises visited, 13 were fully operational in 2009 and one was partially operational as it produced ODS-free aerosols by campaign production according to customer demand.

17. The non-investment and investment projects were implemented over a period of 5-7 years from 1997 to 2008 in the *Ozone-Depleting Substances Portfolio.* The *Portfolio* projects focused on the phase out of CFCs and halon as these were the most ozone-depleting substances. The consumption of halons and CFCs in the CEITs decreased from 2,654 ODP-tonnes in 1998 to just 30.60 ODP-tonnes in 2007 (see Figure 1 on page 34). ODS consumption would have been zero in 2007 if it were not for the consumption in two developing CEITs (Armenia and Turkmenistan) which were permitted CFC consumption in that year in the Montreal Protocol. Therefore the *Portfolio* projects contributed to the elimination of about 2,654 ODP-tonnes over this period of time. The ODS consumed by the CEITs in 1998 also produced approximately 14.6 million tonnes

CO_2-eq per year, which was a significant global warming impact on the climate and equivalent to about 10% of the total CO_2 phase out commitments under the present Kyoto Protocol. By eliminating the consumption of ozone-depleting substances, the GEF projects provided significant global environmental benefit to both the ozone layer and to the climate.

18. The non-investment and investment projects were implemented for 4 years from 2004 to 2008 in the *Methyl Bromide Regional Project.* The *Regional* projects focused on the phase out of all uses of methyl bromide except for quarantine and pre-shipment. The consumption methyl bromide in the CEITs decreased from about 80 tonnes in 2004 to zero from 1 January 2009 (see Figure 2 on page 35). By eliminating the consumption of methyl bromide, the GEF projects provided global environmental benefit by avoiding pesticides that deplete the ozone layer, and provided a valuable contribution to the development of pest control methods that produce food with minimal chemical input.

Conclusion 2: Legislative and policy changes supporting ODS phase-out provided a foundation for success and ensured sustainability

19. The evaluation found that legislative and policy changes to initially restrict and later ban the import and export of ODS; mandate the recovery and recycling of ODS; and that promoted the training of technicians in the refrigeration sector all played a critical role in providing relevant signals to the private sector and individual consumers to adopt more environmentally-friendly alternative chemicals and technologies.

20. Legislative and policy changes were observed to be most successful in the EU-CEITs in both the *Ozone-Depleting Substances Portfolio* and *Methyl Bromide Regional Project*. These countries tended to have legislation in place before or soon after the beginning of the GEF project intervention and all of them continued to update their legislation after joining the EU, which has led to further reductions in ODS and more restrictive measures than those required by the Montreal Protocol. In the case of the *Regional Project*, the legislation to restrict the use of methyl bromide had been in place for several years largely as a result of an earlier GEF project that raised awareness of alternatives to methyl bromide, and because of the need to conform to EU legislation that was more strict than the Montreal Protocol on methyl bromide.

21. In contrast, in the non-EU CEITs many of the projects were slow to develop and the countries were slow to implement legislative and policy changes because the institutional infrastructure necessary to carry out such changes was not in place. The lack of legislation and policy led to problems in controlling ozone-depleting substances, particularly in relation to trade and customs controls. This resulted in consumption of ozone-depleting substances exceeding Montreal Protocol limits for many years. Since projects have been completed in the non-EU-CEITs institutional capacities have been reduced, with insufficient focus on updating of legislation to address emerging issues such as the HCFC phase-out which was recently accelerated in 2007 by the Parties to the Montreal Protocol.

Conclusion 3: The private sector commitment to ODS phase-out was a critical driver for the success of the GEF investments in countries with economies in transition

22. The *Ozone-Depleting Substances Portfolio* had a strong private sector involvement from the early stages of project design through implementation. The umbrella structure of the projects developed by the Implementing Agencies, based on ODS-targeted sub-project investments with the private sector, were efficiently executed. They contributed to the rapid phase-out of ozone-depleting substances and the implementation of ODS-free technologies and chemicals. Key highlights of the results achieved by the industrial sector are reported in Section 7: PROJECT PERFORMANCE AND IMPACT (beginning on page 33) and were as follows:

- Domestic refrigerator and compressor producers: The evaluation assessed seven companies in five CEITs that received funding from the GEF. Four of these companies were still '*going concerns'* in 2009. The companies reported GEF finance was relevant and assisted in providing new technologies that enabled conversion to non-ODS production and achievement of phase-out targets. The GEF financing had been provided at a time (in the late 1990s and early 2000s) when the market was changing quickly and it contributed to companies remaining competitive and profitable, as well as phasing out CFC use. Hence, the investment was good for profit and good for the

environment. One company from Lithuania expanded their operations through internal and acquisitive based growth after the GEF investment. They believed the initial GEF investments allowed them to capture market share which enabled growth. On the other hand, some companies did not survive or have not done well, mainly because they have not been able to produce a product that competes well in an open-market economy;

- Aerosol producers: The evaluation assessed three companies in three CEITs that received funding from the GEF. Four of these companies were still '*going concerns'* in 2009. Two of the companies were fully operational and one partly as it made aerosol products according to demand. All of the companies had met their phase out target of 265 ODP-tonnes phased out.
- Foam producers: The evaluation assessed two companies in two CEITs that received funding from the GEF. One company was still operational in 2009, but many of the companies that depended on products from a one system house had either bankrupt or were partially operational. The spray foam company in Latvia was operational and, as a result of the GEF funding, they had maintained their business and become a participant in an EU initiative to develop eco-friendly formulations. Most of the other companies in the rigid and flexible foam sectors were unable to manufacture foam products without CFCs that were competitive on the local market, and as a result they went bankrupt. The foam area is one of the most competitive worldwide and the transition in many of these companies was not always successful.
- Solvent sector: The evaluation assessed the implementation of ODS-free solvent in one factory. The new equipment was not able to be used because it had not been certified by the local authorities. The cost of certification was estimated to be twice the cost of the equipment supplied, and the costs of certification were not included when the project was formulated.
- Refrigeration and air conditioning servicing industry: The evaluation assessed one project on the recovery and recycling of ozone-depleting substances in each of the nine CEITs. These companies received recycling and recovery equipment for ozone-depleting substances through the project and the majority of this equipment was still being used nearly 10 years after it was first deployed. The companies reported that quantity of ODS recycled and re-used was falling as old ODS based equipment had been replaced with non-ODS alternatives, indicating changes in the market away from ODS. However, one outstanding threat observed was the stock of unwanted and decommissioned ODS (mainly CFCs) held by private companies in drums or other containers, which were at risk of leaking. Over time, this would diminish the global environmental benefit that had accrued as a result of work to phase out ozone-depleting substances.

23. The *Methyl Bromide Regional Project* also had a strong private sector involvement from the early stages of project design through implementation. The private sector contributed to the rapid phase-out of methyl bromide as a soil pesticide (pre-harvest) and in flour mills (post-harvest) through the implementation of MB-free technologies and chemicals. There were many companies involved in the phase out of methyl bromide, and therefore a review by country rather than sector is more appropriate. Key highlights of the results achieved in the *Regional Project* in each country are reported in Section 8 (beginning on page 67) and were as follows:

- Poland: Methyl bromide was replaced with metam sodium for the treatment of soil for strawberry runner plant production. Phosphine and other treatments were used to control pests in flour mills. The metam sodium system resulted in an expansion of the area for strawberry runner production;
- Bulgaria: Methyl bromide was replaced with metam sodium for the treatment of soil. Phosphine and other treatments were used to control pests in flour mills;
- Latvia: Phosphine and other treatments were used to control pests in flour mills. Latvia shared heaters with companies in Lithuania when heat treatments become necessary for pest control in mills;

- Lithuania: Phosphine and other treatments were used to control pests in flour mills. A treatment allowing the quick release of phosphine was approved for use in Lithuania;
- Hungary: Metam sodium was used to replace methyl bromide for soil treatments in open field production. In glasshouses, a progressive company developed mainly bio-control methods to control pests on tomatoes and sweet peppers.

24. Apart from the requirements of the Montreal Protocol to phase out the consumption of methyl bromide, its elimination was also required by legislation in the EU and by supermarket policies and standards that had been established for fruit and vegetable production. These standards were developed in response to consumer concerns about pesticide residues in food and environmental pollution from agriculture. Research and extension services provided an essential role in raising the awareness of the need to adopt alternatives, and in working with farmers to implement integrated pest management or low pesticide procedures to achieve the phase out and to meet the supermarket standards. The fumigation companies that had to be licensed to use methyl bromide in the EU became the main focus of the transition to MB-free procedures, as there were relatively few companies compared to the many thousands of farmers that authorised the soil treatments.

Conclusion 4: Illegal trade threatens to undermine gains in ODS reduction in the non-European Union countries with economies in transition

25. Efforts to combat illegal trade are not yet fully effective and many of the non-EU-CEITs exhibited a lack of technical and legal capacity to curtail such trade, particularly in Kazakhstan, Tajikistan, and Turkmenistan.

26. Illegal trade threatens to undermine the gains in ODS phased out. The existence of old CFC-based equipment has created an ongoing demand for illegal imports of CFCs for refrigeration and air conditioning. Interceptions of illegal trade in ODS, most of which is reported to originate in China, have become frequent in countries such as Kazakhstan and Uzbekistan. Illegal trade in ODS was frequently reported by representatives of companies and government customs officials interviewed, which supported similar findings by specialist bodies such as the World Customs Organization.

27. ODS-containing products such as refrigerators and air-conditioning equipment can be imported unknowingly which increases the demand for ODS that has already been restricted or banned in the importing country. The specifications usually do not provide information on the use of ODS during the manufacture of the entire product.

28. The Parties to the Montreal Protocol have agreed three times as many Decisions in the last eight years on ways to combat illegal trade as they had in the previous twelve years of the Protocol's existence, which is a measure of the growing concern that countries have for illegal trade. ODS trade that is transhipped through one country to another is particularly problematical as procedures and responsibility for monitoring such shipments are less well-defined than for single country destinations.

Conclusion 5: Halon recovery and banking has been neglected in the non-European Union countries with economies in transition

29. Halon is an ODS used in fire fighting agents. Its production has ceased globally because of its severe ozone-depleting properties which destroys about six-times more ozone than CFCs. Globally, halon has been decommissioned from many installations where a suitable alternative exists, and the 'used' halon has been stored for fire fighting applications where an alternative has yet to be developed. Halon is therefore a global resource that has been managed and conserved in well-sealed storage facilities or banks in many countries.

30. The EU-CEITs had management plans in place for halon for many years, and have been actively decommissioning halon and replacing it with alternatives, according to legislative requirements. Quantities decommissioned and banked were reported annually. In the non-EU-CEITs, however, there was little evidence of any active management of halon, or policies and measures that required action to replace halon with alternatives. Funding had been provided by the GEF for equipment, training of technicians and management plans in most Non-EU-CEITs. In many

countries the equipment provided was not being used. Halon use was generally not monitored in most of the non-EU CEITs and existing databases were reported to be out of date. Failure to invest in halon management and banking is an oversight in the GEF ODS programme.

Conclusion 6: In some countries the National Ozone Units ceased to function after GEF support ended and this may prevent measures being put in place to address the remaining threats to the ozone layer

31. The EU-CEITs in the early and mid-1990s depended on international aid to finance ODS reduction and phase out programmes. This is not the case today with the improvement of their economies and links to financial programmes in the EU, that provide sustainable support to address the remaining challenges of ODS phase-out, such as HCFCs, banking and safe destruction of ODS. Many of the National Ozone Units in the EU-CEITs have added the control of fluorinated greenhouse gases (F-gases) to their ODS work, since in many cases F-gases have been used to replace ODS, the legislative requirements for F-gases and ODS are similar, and the same technicians service both air-conditioning and refrigeration equipment containing ODS and F-gases.

32. The non-EU-CEITs, however, are not in this position. Many of them have continually faced funding shortages that threaten the existence of the National Ozone Units that were established to participate in projects that managed, reduced and phased out ODS. Kazakhstan has an NOU that is funded from external contracts rather than the central government budget. Turkmenistan is also dependent on external funding. The GEF approved additional finance for some of these CEITs in 2007, but administrative barriers to disbursement have resulted so far in only one being funded. As a result, the NOUs in the non-EU-CEITs reported difficulties in completing the tasks assigned by the Implementing Agencies.

33. Delays in funding, communication difficulties and administrative burdens have hampered the development and implementation of new programmes. This is leading to increased threats or risks to the successful phase out of the remaining ODS and in particular HCFCs, and to actions to address destruction of banks of unwanted ODS stockpiles.

34. Unwanted CFC stockpiles were reported as a serious problem by many enterprises in the Non-EU-CEITs, as there were no facilities available to destroy these stockpiles. Prolonged storage in decentralised facilities increased the risk of '*disappearing benefits*' as ODS leaks out of storage containers or is dumped by private sector stakeholders. Over time, this will undermine the work that has been undertaken by servicing companies.

Blank for double sided printing

3 Recommendations

Recommendation 1: Countries should improve the implementation of legislation, policies and standards on all aspects of ozone layer protection

35. The implementing agencies failed to identify in a timely manner inadequate reporting of consumption data and insufficient adoption of legislation on ozone-depleting substances in some countries. Implementation of legislation that restricts imports and use of ODS, and accurate/timely reporting of consumption, are crucial steps that help to maintain the compliance of a country with the ODS phase out requirements in the Montreal Protocol. Legislation and policy implementation are essential for the phase out of ODS consumption and for providing the basis for market transformation through the introduction of alternative technologies and chemicals. This is particularly important in non-EU-CEITs which face greater challenges than the EU-CEITs in phasing out HCFCs and reducing illegal trade in ODS.

36. Countries could consider drafting new or updating existing legislation and policies on the following aspects of ODS phase out:

- Recovery, recycling and reporting on ODS;
- Establishing private enterprise standards and requirements, particularly in sectors such as refrigeration and air conditioning servicing sector;
- Import bans for ODS and ODS-containing equipment;
- Dissuasive and proportionate penalties for illegal trade;
- Establishing and promoting the activities of professional refrigeration associations.

37. A critical ingredient for effective implementation of legislation and policy is baseline government funding for NOUs. Experience from the EU-CEITs indicates that post-completion government funding is resulting in continued phase-out of ODS and lowered threats and risks to the ozone layer. The agencies should undertake training for new NOUs and new staff that join the NOUs. Effort directed at ODS elimination also benefits climate, and therefore the funding can be justified on the basis that there are multiple environmental gains.

Recommendation 2: Countries' existing efforts to prevent illegal trade need to be further strengthened

38. Many approaches could be implemented to combat illegal trade. The most important is to reduce the national demand for ODS by encouraging the installation of equipment that is ODS-free, which removes the servicing demand for ODS by using economic and financial instruments and promoting voluntary commitments in the end-user sector. Many countries encouraged enterprises to substitute their CFC-based equipment for non-ODS alternatives, thereby reducing the demand for CFCs.

39. Other approaches to reduce illegal supply of ODS and ODS-containing equipment could include:

- Training and workshops for customs officers and inspectorates on a regular basis to maintain and improve detection capacities;
- Implementation of customs codes for all of the common ODS and blends to enable customs to differentiate legal from illegal trade;
- Establishment of '*send-and-receive*' communications between countries to monitor all shipments of ODS, including details of any ODS contained in the equipment;
- Use of specialised equipment to differentiate legal from illegal ODS;

- Certified laboratory methods for confirming the nature of the ODS intercepted;
- Participation in regional meetings and networks to collate, evaluate and share intelligence on illegal trade as a basis for agreement on further action;
- Awareness-raising of illegal trade in ODS among private enterprises and the general public.

40. These activities need to be supported by legislation that empowers customs officers to take appropriate actions against smugglers and suppliers of illegal ozone-depleting substances.

Recommendation 3: Countries need to take further action to manage and bank halon

41. Experiences from countries that have successfully banked and managed halon indicated that the following approaches could be adopted:

- Development of a Halon Management Plan that includes identification of the quantities of halon installed for different purposes by location, the quantities that can be replaced by alternatives, and a timetable for decommissioning the installed halon;
- Equipment and facilities for recovery and reclamation of halon, with appropriate training for technicians to ensure safe management;
- Accounting and reporting procedures showing quantities decommissioned, reclaimed, stored and recycled;
- Promoting market mechanisms that enable responsible management of the available stock of halon.

42. Non-EU-CEIT countries could also considering making more use of UNEP's halon trader website and to use the funds derived from any sales of halon to support national halon recovery and banking operations.

43. Further emphasis on the development of appropriate legislation and policies is important to provide a stable foundation for the development of a Halon Management Plan and its implementation.

Recommendation 4: UNEP/UNDP should consider further investment and capacity development to assist countries with economies in transition to address the remaining threats to the ozone layer

44. Three threats remain to be mitigated: illegal trade in ODS; phase-out of HCFCs and halon; and lack of destruction facilities for banks of unused CFCs and other ODS. The following actions, particularly are relevant, especially in the non-EU CEITs:

- Investment projects to assist the government and private sector to increase the market penetration of non-ODS, low or zero Global Warming Potential (GWP) alternatives to HCFCs in the refrigeration and foam sectors;
- Investment in destruction facilities to provide government and the private sector with appropriate options for safe and cost-effective disposal of unwanted / unusable ozone-depleting substances ;
- Capacity development for NOUs and customs authorities to function more effectively. This may include *inter alia* further support to update legislation and policy, ODS and non-ODS refrigerant detection equipment, training and technical assistance to improve enforcement to reduce illegal trade in ODS, and networking opportunities for intelligence gathering and analysis.

45. These actions would present opportunities to attain double global environmental benefits - not only for the ozone layer, but also for the climate. This is because ODS is both ozone depleting and global warming. Furthermore, destruction of ODS would create synergies with the ongoing efforts to safely destroy stockpiles of persistent organic pollutants (POPs) in many of the CEITs. There may be opportunities to finance development of joint ODS – POPs destruction facilities.

Recommendation 5: UNEP/UNDP should learn from the positive private sector engagement in the reduction of Ozone Layer Depletion focal area and incorporate similar approaches into its efforts to engage the private sector in other focal areas

46. The portfolio of projects assessed as part of the impact evaluation exhibited strong engagement with the private sector, which contributed to the attainment of global environmental benefits and financial benefits to the enterprises involved. Private sector and government partnerships were important for the elimination of ozone-depleting substances in these projects, and for creating a catalytic affect in some circumstances. Funding of an enterprise requires:

- Undertaking a viability test directed at measuring organizational, economic and financial sustainability, which provides the foundation for targeted and informed green business investments;
- Focusing on a wide range of firms – small, medium and large enterprises from start-ups to established firms with a track-record for product innovation and profitability;
- Targeting a few specific sectors for green business investments which best align environmental goals of the project and financial (profit) growth possibilities;
- Keeping bureaucratic procedures to a minimum, bearing in mind that firms often require quick decisions on investment;
- Identifying champions who have innovative product ideas, technical and political skills, as the work in the ODS portfolio demonstrated that private enterprise 'champions' were critical for producing good business and environmental results; and
- Investing in countries that have government policies and procedures which actively support green business and the '*ease of doing business*' in these countries.

Blank page for double-sided printing

4 Lessons Learnt

47. The lessons learnt in these projects were relevant to specific bodies and project, according to responsibilities within the projects: government, implementing agencies and projects.

4.1 Government

48. Amongst the Non-EU-CEITs in particular, continuing commitment in staff and financial support for projects on ODS phase out *after* the end of the project was completed was a major issue. In some countries, the NOU was downsized to the point where it became impossible for them to be effective in tackling a range of ODS issues. A lesson learnt from this project is that the funding bodies should be much clearer on their expectations of governments to continue funding and staffing of work on ODS after the project finished. Governments should use the funds to enhance institutional capacity and to put in place justification for continued funding while the project is underway and the environmental benefits are becoming evident.

49. Some governments had decided to not fund the NOU from the central budget. For example, Kazakhstan established the Climate Change Coordination Centre which depended on external contracts (UNEP, others) for its existence. The situation was similar in Poland where the NOU had to compete with other private contractors to become the preferred contractor to undertake tasks on ODS for the Ministry of the Environment. The success of the NOUs in both circumstances depended on the qualifications and ability of the staff to undertake the work, and in having sufficient funds available for the work. Out-sourcing activities by the government is a modern approach which has been shown to operate so far in these projects, and might open up opportunities for other governments to consider the same as centralised budgets come under more pressure for reductions.

50. It is important that the NOUs are staffed by some well qualified and senior people that can gain access to key government officials in order to ensure that programmes and legislation on the phase out of ODS are progressed in a timely and effective manner. This works best in many countries where the some staff in the NOU are partially paid by the government and partially from international programmes. In this way, the staff have the ability to rub shoulders with those in the government on a regular basis, which improves government knowledge and confidence in the programmes being carried out by the NOU.

51. Governments could consider establishing a centralised unit staffed by specialists that are knowledgeable in engaging with international funding organisations in environmental projects. In many countries, staff are contracted for the short term that is required to operationalise the projects. At the end of the project, their contract may be terminated and they may not be available for work in a later project. Since there are some common and ongoing features to many of these programmes, a core team of specialised staff could be very efficient and effective in getting many diverse environmental projects operational.

4.2 Implementing Agencies

52. These projects highlighted a number of features that were both positive and negative, and form the basis for these comments on lessons learnt.

53. The *Methyl Bromide Regional Project* involved five core countries and three observer countries that attended workshops. The observer countries were not consumers of methyl bromide but attended the meetings to enhance their knowledge of alternatives and thereby potentially avoid the need for methyl bromide in the future. In these workshops, UNEP and UNDP had more of a participatory role which was helpful for gaining a deeper understanding of the immediate

problems facing the implementation of the project and in contributing potential solutions. UNEP has an extensive knowledge base and stable of experts that can be used when required. One of the lessons learnt in this project was that the participatory approach by UNEP was more effective in managing the projects than the completion of the Monitoring and Evaluation (M&E) forms which too often looked like a copy-and-paste of the same or similar information from one year to the next.

54. The regional workshops that were organised by UNEP in collaboration with UNDP also had the secondary benefit of participating countries and their experts sharing success stories and problems. While on the one hand this might have created an element of competition to see who could get end their use of methyl bromide first, it had a more important effect of showing the diversity of alternatives to methyl bromide that were potentially available and sharing experiences. Countries facing problems were then able to take potential solutions back to their countries for further discussion with their national experts. The workshops were of most benefit when small contact groups were established to discuss specific issues in more depth, and then the conclusions shared with the full meeting in plenary. The lesson learnt from this is that direct UNEP-UNDP participation in regional projects and workshops is useful for the effective implementation of the projects; and that these workshops should allow sufficient time for discussions (plenary and break out groups), which benefit not only the participating countries but also the Implementing Agencies involved in the projects.

55. The financial administration of the projects was not always timely. Section 8 provides details of where poor delivery of finance severely impeded progress in specific countries involved in the *ODS Portfolio*. Lost time on the project meant more emissions of ODS to the atmosphere and environmental damage. Financial delays occurred mainly in the Institutional Strengthening projects and the training projects. Therefore administrative delays are not only demoralising and destabilising for the NOU but they also incur an environmental cost. The lesson learnt is that UNEP must improve delivery of finance to ensure that there are no gaps in time between projects.

56. Communications between UNEP and the NOU are important for ensuring the timeliness of activities such as progress reports of the phase out of ozone-depleting substances and financial updates that promote adherence to agreed budgets. In some Russian-speaking countries, other languages are not spoken. The NOU in these countries was required to translate as many communications as possible into Russian before deciding on the best way to respond to each request. Interpretation was not always available in the workshops which left Russian speakers at a disadvantage. The lesson learnt is that communications should be between UNEP and the NOU in the local language, which means that UNEP will need to employ staff with sufficient language skills to be able communicate effectively with project staff many countries, depending on the project.

57. The project design rarely contained sufficiently well-defined baseline and performance indicators. Without these indicators, it is impossible to measure progress in the project and to effectively engage with the project managers to suggest ways of improving the management of the project. So-called SMART indicators were not present in the majority of the projects, which eliminated the possibility of results-based management. The lesson learnt from this is that the project and task managers must pay more attention to the M&E elements that are developed in the Project Document to ensure that appropriate baseline and performance indicators are carefully checked and are present from the beginning for the project.

58. The performance indicators in the projects must also be realistic. For example, many of the recovery and recycling projects contained ODS recovery targets that were rarely attained in practice. It was also evident that there was very little review of previous projects to incorporate the lessons learnt from them, and on too many occasions the wheel was reinvented and the same mistakes were being made. The lesson learnt is to review the work that was undertaken in the past and design new projects that avoid the pitfalls of past projects.

59. In all of the investment projects in both the *ODS Portfolio* and the *Methyl bromide Regional Project*, there was no financial appraisal of the enterprise prior to providing a grant to the enterprise. The financial appraisal should include an analysis of recent revenues, marketing analysis, operating and investment costs and future marketing opportunities. Companies with a

track record of compliance with green initiatives (legislation, marketing) should be given preference over those that have no such record. A financial appraisal can help to avoid those companies that are unlikely to be sustainable, as the investment in technology needs to be present for many years in order to protect the environment in the future. The lesson learnt is that financial appraisals should be part of the risk assessment for deciding on which enterprises to fund within a sector.

60. Investment projects should also closely match the MLF Guidelines for determining incremental costs. Details of where this was not in the case in specific country projects in the *ODS Portfolio* are provided in Section 8. In some cases, the funding provided was well in excess of the Guidelines because it was based on over optimistic production figures. This occurred, for example, in the SINO refrigerator production facility in Uzbekistan. Over-funding of a project eliminates the participation of other enterprises that can contribute toward the reduction and phase out of ozone-depleting substances. The lesson learnt from this is that investment projects should be based on a realistic assessment of the baseline data as a basis for determining the extent of the funding that is required to promote the transition to ODS-free technology.

4.3 Projects

61. Detailed comments were provided in assessment of progress in specific projects involved in the *ODS Portfolio* and the Methyl bromide Regional Project (see Section 8). However, two sectors are worthy of mention as the lessons learnt can be applied to a larger number of sectors.

62. The projects that were established to collect and store halon had the potential for avoiding significant levels of ozone depletion, since halon is one of the highest ozone depleters. Unfortunately, the halon projects were amongst the most poorly implemented. Many of them lacked leadership and direction, a Halon Management Plan was not evident, there was no government commitment to legislation that would promote halon decommissioning and banking, awareness activities were unfocused, and there was no business plan for financing the halon operations. Since these projects started, halon has acquired a significant value on the global market which, given the quantities of halon that remain installed in many countries, could be used as the basis for financing halon decommissioning and banking operations. The lesson learnt from this is the Implementing Agencies must engage international experts in these projects at an early stage to establish the basic conditions for halon decommissioning and banking operations; and Governments should be more active in establishing legislation supportive of the Halon Management Plan and the involvement of private enterprise. This was regarded by the evaluation team as a missed opportunity in many countries.

63. In general there was a reasonably effective ODS Recovery and Recycling (R&R) project operating in each country. This was essential for avoiding imports of ODS and for using the recovered ODS to service the existing equipment. In many countries, the R&R operations were established too late as the peak of CFCs had already occurred several years earlier. The training periods were sometimes 5 days long which is a long time for an enterprise to have a worker not making income from servicing activities. The curriculum for training in some countries had generally too much emphasis on the theory and not enough on the alternatives and the practical aspects of servicing. Many countries especially the Non-EU-CEITs did not have a Refrigeration Association or similar organisation that could undertake training and certification, and therefore these governments were missing a major delivery organisation that could assist with providing sustainable, self-funding training programmes that improved the capacity of the country to undertake R&R activities. UNEP and UNDP were often not well synchronised as on some occasions the R&R equipment was not available at a time when the training was being carried out. The training experts were often not involved in the selection of the tools used in R&R servicing operations, which resulted in poor quality tools being selected for the project. Last but by no means least, the government needs to have in place legislation that mandates R&R and reporting of the amounts recovered. The main lessons learnt from these experiences is that the training programmes need to be short (two days maximum, preferably one day); focused mainly on the practical aspects and alternatives and less on the theory; be delivered by or in collaboration with a Refrigeration Association so the training becomes self-funding; UNEP/UNDP need to ensure equipment is available before the training starts; and the government needs to have enabling legislation in place that ensures R&R activities are undertaken and enforced.

Blank for double-sided printing

5 Introduction & Background

5.1 The Montreal Protocol

64. Ozone-depleting substances from man-made sources are highly stable compounds that were once used widely throughout modern society, especially for refrigeration and air-conditioning uses. When inadvertently emitted to the atmosphere, they are broken apart by ultraviolet light into chlorine and bromine radicals which deplete the ozone layer. A single chlorine atom can destroy up to 100,000 ozone molecules. A depleted ozone layer fails to protect the earth against highly damaging UV radiation. Enhanced levels of UV-B in particular cause health and environmental problems such as skin cancers[3]; immune system suppression and eye damage; damage to plants, including reduced crop production; and a reduction in diversity of important marine species such as plankton and phytoplankton.

65. It was primarily the impact on human health and crop production of a damaged ozone layer which led to inter-governmental agreement for the adoption of the Vienna Convention for the Protection of the Ozone Layer in 1985 and subsequently the Montreal Protocol on "*Substances that Deplete the Ozone Layer*". In 2009 the Montreal Protocol became the first treaty to achieve universal ratification[4], about twenty years after it came into force in January 1989.

66. The Protocol sets a timetable for phasing-out ozone-depleting substances listed in its Annexes and requires Parties to annually report on the production and consumption of them. Developing countries that consume less ozone-depleting substances than developed countries are allowed more time to phase them out and have access to funds under the Multilateral Environment Facility (MLF) to assist them to meet their phase out commitments.

5.2 The Global Environment Facility

67. Within the developed countries, the Parties recognise a subset called those with *Countries with Economies in Transition* (CEITs). As developed countries, they are not eligible for funding by the MLF. The Global Environment Facility (GEF) is another financial mechanism which was launched in 1991 to assist countries to meet their commitments to environmental treaties including the Montreal Protocol.

68. Although the GEF is not linked formally to the Montreal Protocol, its *Ozone Layer Depletion Focal Area* is an operational response to the Montreal Protocol and its Adjustment and Amendments. The strategic objective of this Focal Area is to protect human health and the environment by assisting countries to phase out their consumption and production of ozone-depleting substances. This is achieved mainly by financing the implementation of alternative technologies and practices. The expected long-term impact of the GEF interventions is to contribute to the return of the ozone layer to pre-1980 ozone levels, which is expected by 2065.

5.3 Controls on ozone-depleting substances

69. In the mid-1980s, the most destructive ozone depleting substances were found to be chlorofluorocarbons (CFCs) and halons. CFCs were widely used as refrigerants in refrigeration and air-conditioning equipment, as blowing agents in foams, as propellants in aerosols, and also as solvents and cleaning agents. Halons are used in fire-extinguishers and in fire fighting

---

[3] A study of people living in Punta Arenas at the southern tip of Chile showed a 56% increase in malignant melanoma and 46% increase in non-melanoma skin cancers over a period of seven years, along with decreased ozone and increased UV-B levels. See Abarca, J.F., Casiccia, C. (2002) Skin cancer and ultraviolet-B radiation under the Antarctic ozone hole: Southern Chile, 1987 – 2000. Photodermatology & Photomedicine. 18, 294 – 302.

[4] Ozone Secretariat. As of 25 November 2009, all 196 Parties had ratified the Montreal Protocol. Status of Ratification.

systems. In the early 1990s, methyl bromide was also added to the Montreal Protocol as an ozone-depleting substance. It was used mainly as an agricultural fumigant to kill pests (mainly nematodes) in soil before planting high-value crops, and to kill pests (mainly insects) in food facilities and flour mills. It is used currently as a postharvest treatment on fresh and durable commodities to kill insects and thereby stop them from becoming highly damaging plant pests, if they are accidentally exported to areas where they are not normally found.

70. Each year the Parties meet to agree on further national actions that should be taken to protect the ozone layer. For each meeting, the Protocol's Technical and Economic Assessment Panel (TEAP), with the assistance of several specialised technical committees, undertakes specific analyses requested by the Parties and provides technical reports to the Parties each year. TEAP provides policy-relevant technical information to the Parties and does not evaluate or recommend policies. Every four years, the Environmental Assessment Panel and the Scientific Assessment Panel provide the most recent information to the Parties on the environmental impact of ozone-depleting substances, and the scientific knowledge of the impact of ozone-depleting substances on the stratosphere, respectively.

71. On the basis of this information provided to the Parties by these Panels of scientific experts, the Parties have agreed Amendments to the phase out schedules to accelerate the reduction and phase out of whole classes of ozone-depleting substances that are controlled by the Montreal Protocol. The first Amendment in 1990 (the London Amendment) added methyl chloroform and carbon tetrachloride as substances controlled by the Protocol; the second in 1992 (the Copenhagen Amendment) added hydrochlorofluorocarbons (HCFCs) and methyl bromide as controlled substances and further accelerated their phase-out schedules; the third in 1997 (the Montreal Amendment) revised the phase out schedule for methyl bromide and added controls on trade with Parties and required Parties to implement a licensing system for ozone-depleting substances; and the fourth in 1999 (the Beijing Amendment) revised the phase out schedule for HCFCs in developed countries. Although not an Amendment, the Adjustment in 2007 to the HCFC schedule was significant because it accelerated the global phase-out schedule for HCFCs.

72. Once a new Amendment or Adjustment has been adopted by the Parties, a developing country or CEIT normally updates their Country Programme as this sets out the commitment by the government to take appropriate actions to ensure compliance with the latest requirements in the Montreal Protocol. The Country Programme describes the production and consumption of ozone-depleting substances in different industrial sectors, together with a strategy statement and Plan of Action to be taken to phase out the ozone-depleting substances.

5.4 National implementation of projects

73. A Country Programme provides the basis for developing financial assistance and is a requirement by the GEF for funding. The Country Programme also enables the Protocol's project implementation agencies to design a Project Document, with activities and a budget, for addressing any deficiencies in the Programme that cannot be met financially or technically by the national government. There are four Implementing Agencies of which UNEP and UNDP are relevant for this *Ozone-Depleting Substances Portfolio* and *Methyl Bromide Regional Project* which are the subjects of this evaluation report. Both organisations have worked extensively together in the past. UNEP specialises in strengthening the institutional capacity of the country to put in place effective actions to help with the phase out of ozone-depleting substances. These actions include awareness raising, training, development of policies and measures, and demonstration on the use of more benign alternatives to ozone depleting substances. UNDP focuses on so-called '*investment*' activities that substitute ODS-dependent with ODS-free technology.

74. The *Ozone-Depleting Substances Portfolio* aimed to phase-out of ozone-depleting substances in nine CEITs. It comprised 42 sub-projects in the refrigeration and air-conditioning, foam blowing, solvent, aerosol and fire-fighting sectors. The nine CEITs involved in this project were Armenia, Azerbaijan, Estonia, Kazakhstan, Latvia, Lithuania, Tajikistan, Turkmenistan and Uzbekistan. Seven of these countries are classified as developed in the Montreal Protocol and required to phase out ozone-depleting substances earlier than Turkmenistan and Armenia which are classified as developing countries.

5.4.1 UNEP sub-project implementation

75. The sub-projects designated for UNEP were implemented by UNEP-DTIE in Paris, which has the mandate for information clearing-house activities, as well as training and policy setting under the Multilateral Fund of the Montreal Protocol. UNDP's sub-projects were executed by UNDP's Montreal Protocol Unit in close coordination with UNDP's GEF unit, and in conjunction with the United Nations Office for Project Services (UNOPS) with the help of their respective UNDP Country Offices, as is the case for most of its Multilateral Fund activities. UNEP, as the GEF Implementing Agency, was responsible for overall project supervision to ensure consistency with GEF and UNEP policies and procedures. UNEP also provided guidance on linkages with related UNEP and GEF-funded activities.

76. Within each country, the NOU was responsible for the implementation of the project in accordance with the objectives and activities outlined in the Project Document. The NOU was most often housed within the Environment Ministry, but occasionally it was independent and under contract to the Ministry. Prior to 2003, the NOU was also responsible for monitoring progress in the sub-project and for reporting back to the UNEP/DGEF and DTIE. In this role, the NOU was often supported by national steering committees. After 2003, UNEP/DGEF and UNEP/DTIE also monitored sub-project progress through direct participation in the national steering committee. UNEP/DGEF was also responsible for reporting back financial and progress reports to the GEF, and for the review and approval of the substantive and technical reports produced in accordance with the schedule of work.

77. To assist the NOU with the implementation of the project, UNEP/DGEF would review, provide guidance and give NOU substantive clearance on the technical content of any contracts, sub-contracts and letters of agreement being entered into by the NOU.

78. Most activities in the sub-projects that involved UNEP were to be completed within 3 years. These involved *Institutional Strengthening* which aimed to improve the expertise and operational competency of staff in the NOU and other relevant organisations, *training of refrigeration technicians* in best-practice management of ozone-depleting substances, and *training of Customs officials* in the identification of ozone-depleting substances and detection of illegal imports.

5.4.1.1 Institutional Strengthening

79. The NOU was usually assisted by a deputy, several national experts engaged on a short term basis for various activities such as ODS data collection, ODS legislation drafting, delivery of training workshops, and officials in other relevant ministries and organisations. UNEP provided policy support for development of sustainable ODS phase-out structures and mechanisms.

80. The NOU was involved in a range of activities. A Work Plan was developed that addressed the national ODS phase-out plan. The NOU was involved in the drafting of the ODS licensing legislation for ODS import/export control and in the establishment of quota system for ODS imports. Other activities included:

- Establishing requirements for labelling ozone-depleting substances and ODS-dependent equipment and products;
- Elaborating the procedures for ODS emission regulation, including changes/revisions;
- Public awareness campaigns, including preparing and distributing leaflets and posters aimed at the public awareness on ozone issues; media articles and interviews on ozone related issues; public seminars on ozone issues; and organising the commemoration of the ozone-day activities;
- Collecting and analysing data on ODS import/export, recovered and recycled ODS and submitting consumption data to the Ozone Secretariat annually;
- Developing the national ODS phase-out schedule, including sector specific restrictions; and
- Submitting progress and financial reports to UNEP/DTIE on the Institutional Strengthening sub-project.

5.4.1.2 Training for Refrigeration Technicians

81. The NOU was responsible for:

- Preparing and organising workshops for refrigeration technicians;
- Obtaining equipment for the training workshops and training centres, consistent with the procurement rules;
- Preparing and publishing the workshop report.

82. UNDP procured the recovery-recycling equipment. This was typically followed by training in its use. The NOU was usually responsible for distributing the equipment to the service technicians and servicing facilities, but sometimes the distribution of equipment was managed by the local refrigeration association or similar body.

5.4.1.3 Training for Customs Officials

83. The NOU was responsible for:

- Coordinating the second[5] phase workshop(s);
- Obtaining equipment for the training workshops and training centres, consistent with the procurement rules;
- Preparing and publishing the workshop report.

5.4.2 UNDP role in sub-project activities

84. UNDP implemented investment sub-projects in these CEITs, which include aerosol, foam, solvent, refrigeration manufacturing and refrigerant and halon recovery/recycling and agricultural projects (see the list of projects and sub-projects in Annex 1). UNDP was responsible for procuring equipment, installing it, on-the-job training, testing and trials, and commissioning the equipment.

[5] UNEP DTIE was directly responsible for the delivery of the Phase 1 Train-the-trainers workshop

6 Scope, Objectives and Methods

6.1 Scope and objectives

85. The *Ozone-Depleting Substances Portfolio* consisted of a Mid-Term Evaluation of the sub-projects implemented in Armenia, and Terminal Evaluations of the sub-projects implemented in Azerbaijan, Estonia, Kazakhstan, Latvia, Lithuania, Tajikistan, Turkmenistan and Uzbekistan.

86. The *Methyl Bromide Regional Project* consisted of Terminal Evaluations of the sub-projects implemented in Bulgaria, Hungary, Latvia, Lithuania, and Poland.

87. These evaluations determined the extent to which the sub-project's objectives had been achieved, or are expected to be achieved, and assessed any other positive or negative impact of the projects. Where possible, the extent and magnitude of the impact of the sub-project was documented and the likelihood of future impacts determined.

88. The Mid-Term and Terminal Evaluations assessed the performance of each sub-project and the implementation of planned project activities and planned outputs against actual results achieved.

89. The Scope and Objectives are contained within the Terms of Reference provided to the consultants for the *Ozone-Depleting Substances Portfolio* and the *Methyl Bromide Regional Project* (see Annex 1 on page 687).

6.2 Methods used in the evaluation

90. The Evaluation used a combination of approaches to assess the impact of the sub-project from several perspectives, using a mix of quantitative and qualitative methods of data collection and analysis: Desk reviews, face-to-face meetings, and follow up with key stakeholders as necessary.

91. The consultants selected for the evaluation by UNEP were experienced in issues relating to the phase out of ozone-depleting substances and the implementation of alternatives through their work over the past twenty years for various organisations and committees at both national and international levels (Annex 2: "Evaluator Expertise" on page 725). The Assignment of Responsibilities between the consultants for this Evaluation, and the Mission Schedule for each consultant, is shown on page 727 in Annex 3 "Assignment of Responsibilities and Mission Schedule".

92. The desk review included a review of the project documents, outputs, monitoring reports (such as progress and financial reports to UNEP, UNDP and GEF annual Project Implementation Review reports) and relevant correspondence; interviews with international consultants involved in the implementation of projects and sub-projects; notes from the Steering Group meetings; other materials produced by the project staff, international consultants or partners; and material and project information uploaded onto an ftp site by Task Manager. The Ozone Secretariat database was used for verifying consumption data as these data had been officially supplied by the country in accordance with Article 7 of the Montreal Protocol.

93. Sources of information necessary to support a comment in the text were footnoted to that comment in the relevant section of the report. Where possible and to facilitate reference retrieval, the relevant wording in the text was hyperlinked to relevant information either directly to the text or in the footnote. Documents reviewed were also listed on page 729 in Annex 4: "Documents Reviewed".

94. Face-to-face meetings were held with the NOUs in each country except Lithuania where the NOU had a preference for supplying the information for the report by email. The Senior Evaluation

Officer UNEP/EOU wrote a letter to each of the NOUs informing them of the pending Evaluation and introducing the contractors that were undertaking the Evaluation. The letter identified the need for the NOU to facilitate meetings of the consultants with stakeholders and beneficiaries that had been involved in the sub-projects in order to obtain information on the results, its sustainability, strengths and weaknesses.

95. The meetings with the NOUs were undertaken at the same time as an Impact Evaluation was being undertaken for the GEF in Kazakhstan and Uzbekistan, in order to share the costs of the Evaluations for both UNEP and the GEF. The letter from UNEP/EOU was followed by a request from the consultant to the NOU for a three day meeting at a mutually agreeable time in which the relevant information could be obtained and analysed. The consultant requested the NOU to arrange meetings with beneficiaries of the equipment so that the impact of the project could be determined from firsthand accounts.

96. Interviews and telephone interviews were held with stakeholders involved in the sub-projects, Additional information and opinions were obtained from representatives of the GEF, UNEP, UNDP and the MLF that had experience in these or similar projects. The interviews were combined with a questionnaire that was sent by the NOU to commercial stakeholders. When necessary there was follow up with the stakeholders in order to obtain new information or to clarify draft information. The consultants engaged the services of a local interpreter when interpretation became necessary for communication. The information obtained from the sources described above was transcribed for each project into the UNEP template using the format provided in the Terms of Reference (Annex 1 on page 687).

97. The consultants conducted in-depth interviews using standardized, semi-structured guides and questionnaire surveys with government, research institutes and private sector enterprises. The questionnaire survey was devised about half way through the completion of the missions in order to validate and confirm key issues arising out of the qualitative data collection. In these ways, the approach adopted conformed to current practices in impact evaluation which is to use a combination of qualitative and quantitative methods.

98. The UNEP/EOU was kept informed of progress on the GEF Evaluation Report and this evaluation report. A list of interviewees is shown in page 741 in Annex 5: "Interviewees".

99. In the format for the report, the UNEP Terms of Reference required no more than 50 pages for the executive summary, conclusions, recommendations and lessons learned. The main substantive part of the report in Section 8 followed these 50 pages and described the "*Project Performance, Impact Evaluations and Ratings*" for each project implemented in each country. In these project assessments, Mr Valery Smirnov was assigned the four Russian-speaking countries of Armenia, Azerbaijan, Tajikistan and Turkmenistan; and Dr Tom Batchelor was assigned responsibility for the remaining countries that were in Europe (Bulgaria, Estonia, Hungary, Latvia, Lithuania, Poland) and Central Asia (Kazakhstan and Uzbekistan).

100. There were some limitations that constrained the evaluation. Firstly, annual data relating to the consumption of ozone-depleting substances by CEITs was not always submitted by these countries for every year and for each class of ozone-depleting substances. Data gaps resulted in a focus on this evaluation only on CFC and halon across CEITs, as the consumption of these classes of substances were reported more consistently than others. This limitation was not serious because CFC and halon are amongst the most important of the ODS in terms of being among the most ozone depleting, and they were required to be the main focus of the evaluation as required by the Terms of Reference. Secondly, financial information always included a budget but a report on expenditure was not available in many cases. Data on GEF funding across CEITs and co-financing available in the GEF database were not always consistent with data obtained from implementation completion reports. These financial limitations were not serious as the evaluation required more emphasis on the outcomes and impact of the project rather than on the financial aspects.

7 Project Performance & Impact

101. Based on the information in Section 8, the project performance and impact was assessed across the *ODS Portfolio* and the *Methyl Bromide Regional Project* in several key areas (*horizontal assessment)*:

- The phase out of ozone-depleting substances;
- Institutional strengthening;
- Recovery and recycling of ODS;
- Control of illegal trade;
- Investments in technology that eliminated ozone-depleting substances.

102. The PROJECT PERFORMANCE AND IMPACT was also summarised in Section 7 above.

7.1 Ozone-depleting substances phased out

7.1.1 Ozone-depleting substances portfolio

103. The impact of the projects to phase out ozone-depleting substances was determined by examination of the consumption[6] data officially submitted to the Ozone Secretariat in the mandatory[7] annual reports provided to the Montreal Protocol by governments that had ratified this treaty. For this impact evaluation, the reductions in CFCs and halon were the most important since these were required to be phased out in seven of the nine countries that were categorised as developed in the Montreal Protocol and that were evaluated in this project.

104. The time period for the impact assessment was determined by examination of the start and end date of the projects. There were 42 projects in nine CEITs in this evaluation. The projects commenced over a 3-year period from July 1997 to February 2000. Armenia commenced in 2004 as discussions over its re-categorisation from developed to developing CEIT delayed the start of its projects. Most of the projects were completed in 5-7 years after the start, which was longer than originally anticipated of three years.

105. It is therefore reasonable to examine the reductions in CFC and halon consumption for the period 1997 to 2007 (Figure 1). Figure 1 shows that there was an initial increase in reported consumption between 1997 and 1998, possibly because some of the projects had not been initiated or were in the early stages of initiation and work had not yet commenced to reduce, followed by a prolonged period of significant decline in the consumption of CFCs and halon.

106. The consumption shown in Figure 1 does not reach zero because of the consumption in 2006 and 2007 of CFCs only in Armenia and Turkmenistan (shown in red) who are developing countries. The Montreal Protocol allowed developing countries to consume CFCs in 2007. In 2005, the CFC and halon consumption was mostly due to consumption in Armenia and Turkmenistan (101.9 ODP-tonnes), and some consumption by Azerbaijan (21.9 ODP-tonnes) which was categorised as a developed country in the Montreal Protocol.

107. Further details of the phase out of the consumption of ozone-depleting substances in the

---

[6] Montreal Protocol Handbook. 2007. Consumption means production plus imports minus exports of controlled substances. Article 1: Definitions

[7] Required in the Montreal Protocol according to Article 7: Data Reporting.

projects implemented in each country can be obtained from Section 8: PROJECT PERFORMANCE, IMPACT EVALUATIONS AND RATINGS.

7.1.2 Methyl bromide regional project

108. UNEP stated that the aim of the project was to phase-out about 167 tonnes of non-exempted uses of methyl bromide in specific Countries with Economies in Transition: Bulgaria, Hungary, Latvia, Lithuania and Poland[8]. Elimination of methyl bromide would enable these countries to comply with the requirement in the Montreal Protocol of zero consumption of methyl bromide by 31 December 2004, excluding quarantine and pre-shipment and other exempted uses. Azerbaijan and Uzbekistan were permitted to participate as observers, even though they reported no consumption in methyl bromide, as they wanted to improve their knowledge of alternatives and to avoid any need for methyl bromide in the future.

109.

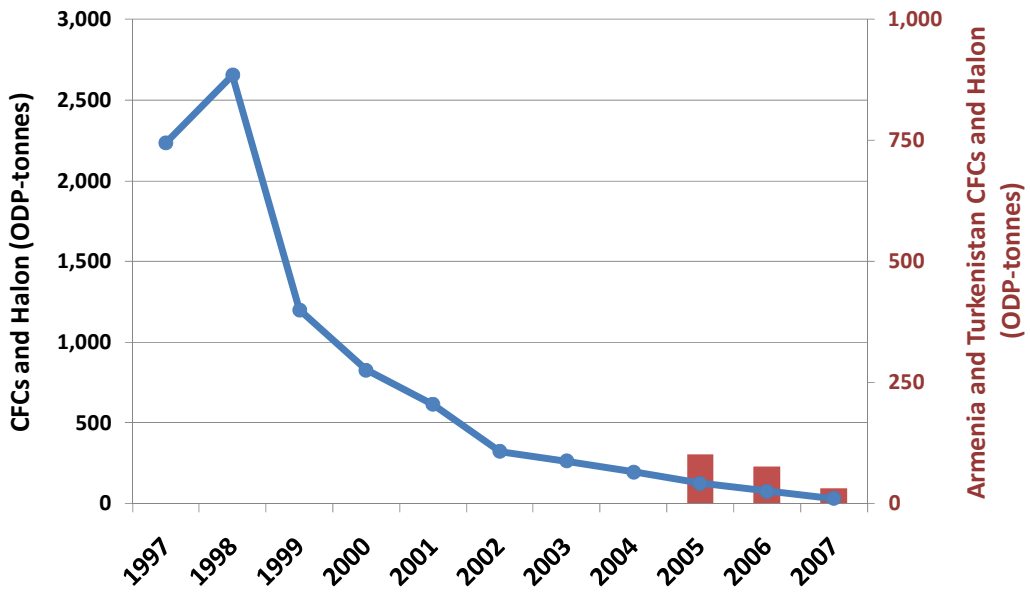


Figure 1: Impact of projects to phase out the consumption of ozone-depleting substances (CFCs and halon) in nine CEITS

110. This project built on a previous project GF-4040-00-10 that commenced in March 2000 and concluded in September 2002 entitled "*Initiating early phase out of methyl bromide in CEITs through awareness raising, policy development and demonstration/training activities*"[9]. It led to a reduction in methyl bromide use as a result of the development and translation of public awareness materials, demonstration projects, regional training activities and policy development. However, complete phase out was not achieved mainly because further investment was needed in alternative technology, training in the use of the alternatives, and improvements in technical capacity which became the focus of activities in the project examined in this evaluation.

111. The results of the project "*Total sector methyl bromide phase out in countries with economies in transition*" were determined by examination of the methyl bromide consumption[10] data officially submitted to the Ozone Secretariat in the mandatory[11] annual reports provided to the Montreal Protocol by Bulgaria, Hungary, Latvia, Lithuania and Poland.

112. The results are shown in Figure 2, which shows that methyl bromide consumption was reduced from about 80 tonnes at the start of the project to zero from 1 January 2009. The methyl bromide consumption between 2003 and 2005 was extrapolated because in 2004 these

---

[8] UNEP. 2009. Terminal Evaluation of the UNEP GEF project GF/4040-05-05 "*Total Sector Methyl Bromide Phase Out in Countries with Economies in Transition*". Terms of Reference. 21 pages.

[9] GF/4040-00-10 for CEITs Bulgaria, Estonia, Hungary, Latvia, Lithuania, Poland and Slovakia.

[10] Montreal Protocol Handbook. 2007. Consumption means production plus imports minus exports of controlled substances. Article 1: Definitions

[11] Required in the Montreal Protocol according to Article 7: Data Reporting.

countries acceded to the European Union and the reported consumption of zero may not be an accurate report of the consumption at that time[12].

113. From 1 January 2005, Bulgaria, Hungary and Lithuania reported no methyl bromide consumption, but Latvia and Poland requested approval from the Parties to the Montreal Protocol to use critical uses of methyl bromide, as they had yet to implement alternatives for all methyl bromide uses. Latvia and Poland were approved critical use exemptions by the Parties. However, Latvia was not authorised by the European Commission to use methyl bromide in flour mills as a technically and economically feasible alternative (phosphine) was available in Latvia. The period from 1 January 2005 therefore shows Poland as the only consumer of methyl bromide in this regional project from this time onwards.

114. The baseline for the project established by UNEP of 167 tonnes (Figure 2, left dotted line) was close to the reported consumption of methyl bromide in these five countries in 1999 of 162.7 tonnes. UNEP's baseline did not appear to take into account reductions in the consumption of methyl bromide that had occurred as a result of the implementation of the previous methyl bromide project GF-4040-00-10 which was completed in 2002. That project halved methyl bromide consumption in these countries to about 80 tonnes in 2002, which would appear to be a more appropriate baseline.

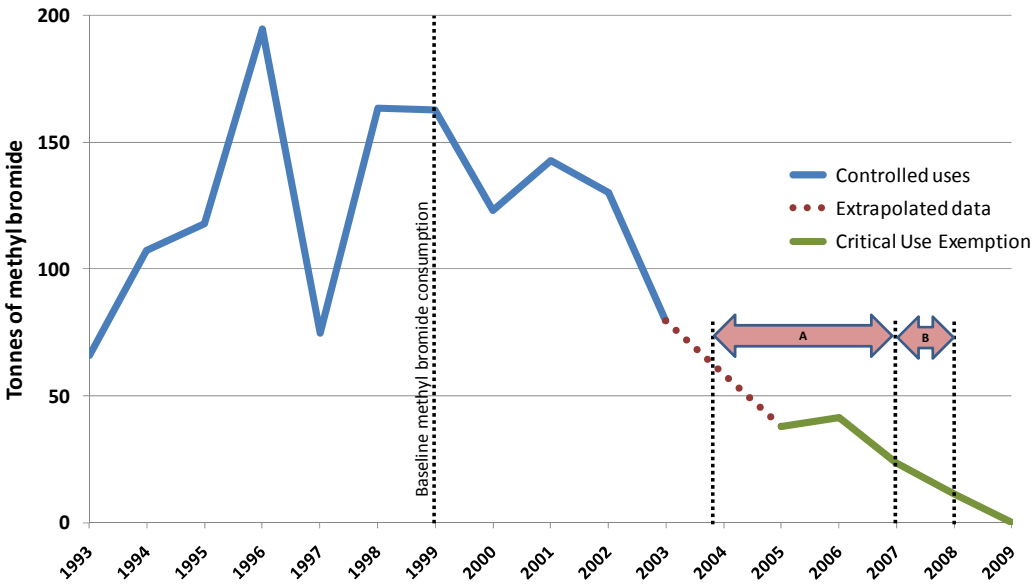


Figure 2: Reduction in methyl bromide consumption in Bulgaria, Hungary, Latvia, Lithuania and Poland during the period of the project (A) and its extension (B)

115. The phase out of methyl bromide within the timeframe of the project was achieved by four of the countries. Only Poland was authorised by the Commission to use methyl bromide for critical uses from 1 January 2005. The countries reported that they were satisfied with the management, operations and funding provided by project which was considered essential for phasing out methyl bromide. In some cases, the alternative improved crop production compared to methyl bromide. For example, the four-fold increase in the area of strawberry runner cultivation in Poland to about 100 ha over a two year period was attributed to the soil equipment provided in the project.

116. Participating countries considered further funding essential for continuing to implement new alternatives and to refine the existing ones. Parties were concerned with the review of fumigants selected as alternatives to methyl bromide which questioned their sustainability in the longer term.

117. Despite these concerns, the prospects of returning to methyl bromide were assessed as remote. Shortly after the project was completed, new legislation on ozone-depleting substances came

[12] Each country was responsible for reporting methyl bromide consumption to the Montreal Protocol from 1 January to 30 April 2004. The Commission was responsible for reporting consumption from 1 May to 31 December 2004.

into force on 1 January 2010 in all Member States in the EU, including the five countries involved in the regional project. Regulation (EC) No 1005/2009 bans the use of methyl bromide for all uses including quarantine and pre-shipment, as it did not meet the safety criteria contained in the Biocides Directive[13] and the Pesticides Directive[14].

118. Further details of the phase out of the consumption of methyl bromide in each Country with Economy in Transition that participated in the *Regional Project* can be obtained from Section 8 (Bulgaria, Hungary, Latvia, Lithuania, and Poland) beginning on page 67.

7.2 Institutional strengthening

119. The expected outcomes in the Institutional Strengthening sub-project included an NOU with sufficient, well-qualified staff that was funded as a unit from the central budget; the drafting and implementation of legislation that restricted imports of ODS and facilitated the phase out on the market; increased cooperation between the NOU and other stakeholders, especially the Customs service; ratification of amendments in the Montreal Protocol; and routine data collection, analysis, reporting and dissemination of information on issues related to ozone layer protection. The extent to which each of these outcomes had been achieved in each of nine CEITs was examined, and the results are summarised in Table 1.

Table 1: Institutional strengthening of the NOU as measured by activities on legislative measures, ratifications, and cooperation with customs including training

COUNTRY	NOU financed from central budget	Number of Montreal Protocol amendments ratified by the government	Year that import of CFCs were banned	Targeted legislation before or during Project	Frequency of reports from Customs to Environment Ministry or to NOU	Customs, Inspectorate and other agencies cooperation
1	2	3	4	5	6	7
Bulgaria	Yes	6	1996	Yes	12m	Yes
Estonia	Yes	6	1999	Yes	3m	Yes
Hungary	Yes	6	1994	Yes	12m	Yes
Latvia	Yes	6	2001	Yes	Unkn	Yes
Lithuania	Yes	6	1996	Yes	6m	Yes
Poland	No	6	1996	Yes	Unkn	Unkn
Kazakhstan	No	3	20O5	Yes	Unkn	Unkn
Uzbekistan	Yes	6	2000	Yes	6m	Yes
Armenia	Yes	6	2010	Yes	12m	Yes
Azerbaijan	Yes	5	20O2	Yes	12m	Unkn
Tajikistan	Yes	6	20O4	Yes	12m	Yes
Turkmenistan	No	6	2010	No	12m	Yes

7.2.1.1 Source of finance for the NOU

120. All of the CEITs were funded from the central government budget, except for Kazakhstan and Poland (Table 1, Column 2).

121. In Kazakhstan, the Climate Change Coordination Centre was formed in 2002 and is funded through commercial contracts with clients and by grants received from international donors. A relatively large NOU of six staff within the Centre directed about 30% of its activities toward ozone layer protection. The Centre must bid for government contracts, and its continued success rests to a large extent on its record of carrying out work to standard acceptable to the various funding agencies. The funding for the Centre could be regarded as more stable than NOUs in other countries that must rely on funding for their ozone protection activities from a single source – the government – which can alter funding according to political and economic imperatives. The situation was similar in Poland where the government had contracted the

[13] Regulation (EC) 2032/2003
[14] Decision 2008/753/EC

specialised services of the Ozone Layer Protection Unit within the Industrial Chemistry Research Institute in Warsaw to undertake defined work on ozone layer protection. The sustainability of the Unit depended on it being the government's preferred service provider on *inter alia* ODS data collection and a range of other activities that promoted the phase out of ozone-depleting substances.

122. Unlike the situation in developing countries where the funding from the MLF has helped to form a relatively stable staff typically attached to the Environment department of a country, there is no such infrastructural support for NOU staff in developed countries. A case in point is Turkmenistan. The NOU in Turkmenistan was established in October 1999 as a non-governmental non-profit organization under the supervision of the Ministry of Nature Protection. The NOU depended entirely on project funding for all activities including the salaries of the NOU staff. The future of the NOU was temporarily secured in 2005 when Turkmenistan was approved 3 years of funding for institutional strengthening by the MLF. As a result, Turkmenistan reported ODS consumption to the Montreal Protocol each year, but often late because of the difficulties of compiling the data from diverse sources. Other activities to reduce and eliminate CFC consumption were limited by the lack of legislation. Turkmenistan did not achieve zero consumption of CFCs in 2003 as required by the Parties[15], and in 2004 reported consumption of CFCs in non-compliance with the Montreal Protocol.

123. The NOU from Azerbaijan was disestablished in 2002 when the project was completed in 2002, and re-established in 2003 by the Government with new funding. The funds were insufficient to support suitably qualified personnel. As evidence of the problems faced by the NOU, ODS consumption was often reported late and inaccurately to the Montreal Protocol because of the difficulties of compiling the data from diverse sources. Other activities to reduce and eliminate CFC consumption in Azerbaijan were limited or non-existent. Azerbaijan did not achieve zero consumption of CFCs in 2002 as required by the Parties[16] and was in non-compliance with the Montreal Protocol until 2006.

124. The number of staff that were assigned to ozone layer protection activities within the NOU in each country varied from 0.25 FTE in Latvia to six staff in the Climate Change Coordination Centre in Kazakhstan. In general, EU-CEITs had fewer staff working on ozone layer protection and the staff that were present tended to work on other gases such as F-gases at the same time. NOU in EU CEITs also shared the workload with other ministries, organisations and services based on legislation that officially designated these other bodies with specific responsibilities.

125. Using Latvia as the example since it had the fewest FTE contributing to ozone layer protection, Latvia used the "Latvian Environment, Geology and Meteorology Agency" for statistical analysis on the quantity of ODS used and for what purposes; the State Plant Protection Service for the implementation of alternatives to methyl bromide; the State Revenue Service – Customs Department for controlling the import and export of ODS to non-EU countries; the Inspectorate in the State Environmental Service for visits to companies to determine the use and emissions of ODS; the State Fire-Fighting and Rescue Service for advice on halon and alternatives; the Civil Aviation and the Marine Administrations for advice on halon uses; and the Latvian Refrigeration Engineers Association (LREA) for technical training on refrigerant management.

7.2.1.2 Ratifications

126. The CEITs ratified, acceded, accepted or approved up to 6 legislative instruments: The Vienna Convention and the Montreal Protocol; followed by the London, Copenhagen, Montreal and Beijing Amendments.

127. Most countries in this evaluation had by 2009 ratified all six amendments to the Montreal Protocol, except for Kazakhstan that had ratified three and Azerbaijan that had ratified five (Table 1, Column 3). Kazakhstan had yet to accede to the Copenhagen, Montreal and Beijing Amendments. As Kazakhstan had not accepted the obligations of the Copenhagen and Beijing Amendments, HCFCs that were imported after 1 April 2004 by Kazakhstan were not in compliance with the Montreal Protocol, based on the requirements of Decision XV/3 that was agreed by the Parties on trade in HCFCs in 2003. That Decision clarified that trade in HCFCs

[15] Decision XI/25 in 1999 required zero consumption of CFCs by 2003.
[16] Decision X/20 in 1998 required zero consumption of CFCs by 2001

should be between Parties that had agreed to be bound by the obligations of both the Beijing and Copenhagen Amendments. The Decision permitted developed countries that had yet to ratify, accede or accept the Beijing Amendment to submit data to the Ozone Secretariat by 31 March 2004 of their intention to do so, as well as to supply information to show that they were in full compliance with Articles 2, 2A to 2G and 4 of the Montreal Protocol. Kazakhstan was not mentioned in the report by the Ozone Secretariat to the Parties in 2004, suggesting that information had not been submitted. In addition, Kazakhstan imported HCFCs in excess of its consumption limit from 1 January 2004 for each year from 2004 to 2007 inclusive, and exceeded the consumption limit for non-QPS methyl bromide in 2006 and 2007. These actions would make it difficult for Kazakhstan to show that it was in full compliance with Articles 2, 2A to 2G and 4 of the Montreal Protocol. Therefore, the government of Kazakhstan appeared less committed and focused on the Montreal Protocol than the other CEITs that were evaluated. In this regard, the funding in the project has not assisted Kazakhstan sufficiently to complete the ratification process and indicated that further assistance to the NOU would be required.

7.2.1.3 Reduction in ozone-depleting substances

128. In regard to the overall reduction in ODS over the period of the projects, Section 7.1.1 showed a significant decline in ozone-depleting substances (see Figure 1 in Section 7.1.1 on page 34) and methyl bromide (see Figure 2 in Section 7.1.2 on page 35). This decline in ozone-depleting substances suggested that the NOUs in general had been sufficiently strengthened by the funding and activities carried out in this project.

7.2.1.4 Legislation

129. In the ODS portfolio, the ban on the import of CFCs is an important legislative indicator of the focus by governments in reducing ongoing demand for ODS and also to encourage use of alternatives. CEITs that banned CFC imports more than a year before the end of the Project in each country were considered to have implemented legislation that targeted the ODS reduction and phase out, as they used the legislation to drive the reductions (Table 1, Column 4). The EU-CEITs banned the import of CFCs much earlier (from 1994 to 2001) than the Non-EU-CEITs.

130. The survey questionnaire showed that the NOUs in the EU-CEITs (Estonia and Lithuania) '*strongly agreed*' that sufficient legal and policy instruments were currently in place to address the reduction and phase out of ODS, compared to NOUs from Latvia, Tajikistan, Turkmenistan and Uzbekistan in the Non-EU-CEITs that '*slightly disagreed*' that that sufficient legal and policy instruments were currently in place. The positive response from Estonia and Lithuania suggested that the regional EU legislation had assisted with the implementation of national policies and measures to promote the phase out of ozone-depleting substances in those countries.

131. All countries except Turkmenistan had intended to put in place legislation during the project (Table 1, Column 5). Proposed legislation in 2002 was not implemented in Turkmenistan because it was not approved by the legal department of the Cabinet of Ministers. One year later, a measure was approved for the licensing of imports and exports of chemicals in general, but not specifically ozone-depleting substances. The lack of focused legislation in Turkmenistan has resulted in a diversity of departments being involved in tracing and recording imports of ozone-depleting substances, which has made it difficult for the NOU to compile accurate information on the consumption of ozone-depleting substances. CFC quotas were introduced only in 2005.

132. In regard to the Regional Project that phased out methyl bromide, all of the countries involved in the programme had put in place legislation that had restricted imports of methyl bromide for all uses except QPS. Permitting or licensing systems were required to import methyl bromide, import quotas were in place, and in some cases new uses were banned. This legislation was implemented prior to the commencement of this project in late 2004 and 2005 as a result of the countries' involvement in the project "*Initiating early phase out of methyl bromide in CEITs through awareness raising, policy development and demonstration/training activities*" which started in 2000 and concluded in 2002. Bulgaria, Hungary, Latvia, Lithuania and Poland also had to harmonise their national legislation with the EU legislation prior to acceding to the EU on 1 May 2004 (for the last 4 countries) and on 1 January 2007 for Bulgaria.

7.2.1.5 Cooperation between the NOU and other stakeholders

133. The Customs service is one of the most important collaborators with the NOU because of its responsibility for intercepting illegal trade in ODS and ODS-containing equipment. The Customs service can be a strong determinant in enforcing legislation and policies on ODS. The degree of cooperation between the NOU and the Customs service, and the extent of the training of the Customs officers in detecting ODS and ODS-containing equipment, was used as an indicator of the extent to which the NOU has been strengthened by the Institutional Strengthening project.

134. One of measures of the cooperation is the frequency of reports of illegal interceptions between the Customs service / Inspectorate and the Ministry of Environment or the NOU (Table 1, Columns 6 and 7). This was reported to be 3-12 months for all countries in the *Portfolio* except for Azerbaijan, Latvia, Poland and Kazakhstan where the information was not available. Some countries such as Kazakhstan and Uzbekistan reported that they focused more on imports from some countries than others, based on their experiences with illegal trade in the past, which assisted them to intercept illegal trade in ODS more effectively.

7.2.1.6 Data collection and reporting

135. The nine CEITs shown in Table 1 have reported their consumption of CFCs and halon for each year from 1996 to 2007. This suggested that there was no impact of the project on reporting of consumption since there was no change in annual reporting before and after the project was implemented.

7.3 Recovery and recycling of ozone-depleting substances

136. The recovery, recycling and reclamation ("3R") consisted of equipment that was provided for these activities, and training in the use of the equipment. The expected outcomes from the project were tools and equipment delivered to servicing facilities, reports on the amounts recovered and recycled-reclaimed and consequently reduced emissions, training providers that developed training modules for delivery to trainees, and reductions in the imports of ODS. One of the benefits was the cost of premature CFC-equipment retirement could be avoided by cost-effectively using recovered and recycled CFCs. In addition, the demand for illegal imports of CFCs could also be reduced by using recovered and recycled CFCs.

7.3.1 Ozone-depleting substances portfolio

137. Recovered ODS was important for providing a source of ODS within the country to support the refrigerant demand when servicing refrigeration and air conditioning equipment, at a time when imports or production of CFCs were reduced or banned altogether. The ability of countries to implement effective 3R programmes depended on a number of factors: the legislation they had in place; the training and certification of personnel in best-practice refrigerant management; the availability of equipment and its distribution; and whether or not the recovery and recycling operations continued after the project was completed. An institute or local association was present in some countries to assist with the distribution of equipment and the training of personnel. Some countries also reported facilities that enabled destruction of unwanted ODS. Some countries provided annual reports showing the quantities of ozone-depleting substances recovered and recycled. These factors were examined for each of the countries in this evaluation and summarised in Table 3 below.

7.3.1.1 Legislation

138. The key legislative measures that promoted and encouraged 3R in these eight countries are shown in columns 5-8 in Table 3. Armenia and Turkmenistan that were both classified as developing countries in the Montreal Protocol did not have legislation that mandated 3R, reporting on amount of ODS recovered-recycled-reclaimed, legislation that required personnel that handled ODS to hold qualifications, and they did not have penalties in place for fining unqualified personnel that were working in ODS 3R operations.

139. In contrast to these developing countries, Latvia, Lithuania and Estonia that are developed countries within the EU, had legislation that mandated 3R, legislation that required reporting on amount of ODS recovered-recycled-reclaimed, and legislation that required personnel that handled ODS to hold qualifications. Penalties were in place for fining unqualified personnel that

were working in ODS 3R operations in Latvia and Lithuania but they had yet to be implemented in Estonia. These countries, as perspective members at the start of the project and later as members of the EU toward the completion stages of the project, were encouraged by EU legislation[17] that required States are required to take steps to promote the recovery, recycling, reclamation and destruction of controlled substances; to assign to users, refrigeration technicians or other appropriate bodies responsibility for ensuring compliance with the recovered for destruction by technologies approved by the Parties or by any other environmentally acceptable destruction technology, or for recycling or reclamation during the servicing and maintenance of equipment or before the dismantling or disposal of equipment. Member States were required to define the minimum qualification requirements for the personnel involved, and to report to the Commission on the programmes related to the above qualification requirements. The Commission was required to evaluate the measures taken by the Member States. In the light of this evaluation and of technical and other relevant information, the Commission was required to propose measures regarding those minimum qualification requirements[18]. Furthermore, Member States that failed to comply with the requirements were liable to be penalised, which encouraged them to take action on 3R.

140. The remaining countries (Azerbaijan, Kazakhstan, Tajikistan and Uzbekistan) had none or some of these legislative elements in place, but not all of them. Kazakhstan had legislation requiring qualification requirements for personnel working with ODS, Tajikistan and Uzbekistan had legislation that mandated ODS to be recovered and recycled, and Uzbekistan had legislation that required servicing companies to report on the quantities of ODS recovered and recycled. None of them had penalties in place for unqualified personnel servicing equipment that contained ODS. Without a penalty, there was no incentive for technicians to pay for becoming qualified and ODS was being handled in ways that probably increased emissions to the atmosphere.

141. Regional legislation such as that in the EU that mandates 3R activities was assessed as a major driver for countries modifying their national legislation. Without this driver the countries were not encouraged to implement legislative measures on 3R, which in turn reduced the ability of such countries to implement and enforce 3R activities, undertake training in best-practice management of ODS (Section 7.3.1.2 below), and to report on ODS recovered and recycled (Section 7.3.1.5 below).

7.3.1.2 Training and certification

142. Training in best-practice management of ozone-depleting substances was important for minimising emissions of ODS to the atmosphere and for recovering as much recovered ODS as possible to meet the servicing demand, thereby avoiding imports of ODS. Some countries therefore put more effort into training than others, as shown in Figure 3 by the number of technicians trained during[19] the project.

143. About 64% (5,013 technicians) of the total number of technicians trained (7,879 technicians) in the nine CEITs were from Kazakhstan and Uzbekistan. The large number trained relative to other countries in the project showed the importance that Kazakhstan and Uzbekistan attached to having ODS recovered and recycled. Kazakhstan also continued training after the project was completed, which showed the importance that Kazakhstan attached to 3R.

144. The EU countries of Lithuania, Estonia and Latvia had the fewest trained during the project but were the only ones that had undertaken training before (Lithuania) or after (Latvia, Lithuania) the project was completed. The EU countries were obliged to have established training and certification procedures to promote the minimise emissions of fluorinated gases (F-gases) from 1 July 2008 from refrigeration and air-conditioning equipment[20]. The same F-gas training procedures are also used for technicians handling ozone-depleting substances, as in many cases F-gases were found to be replacements for ozone-depleting substances and the same technicians were handling both ODS and F-gases.

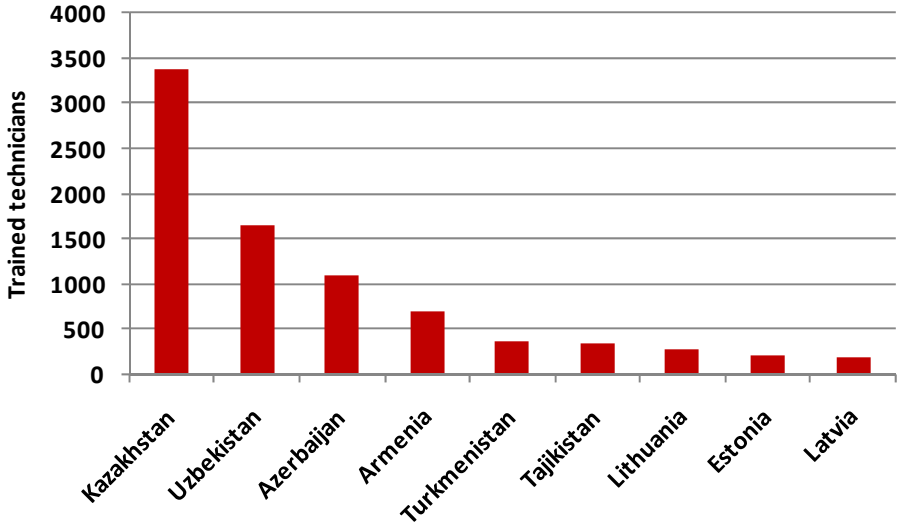
145. Some countries provided a certificate after the training (Estonia, Kazakhstan, Lithuania,

---

[17] Regulation No (EC) 2037/2000 on 'Substances that Deplete the Ozone Layer'.
[18] Paragraphs 1 and 5 of Article 16 in Regulation (EC) No 2037/2000.
[19] Lithuania was the exception that trained personnel before the project and not during the project
[20] Regulation (EC) No 842/2006 on certain fluorinated greenhouse gases.

Turkmenistan), but most did not. In addition to the certificate, Latvia and Lithuania provided technicians with an identity card that technicians could show to prospective clients as evidence of their qualification requirements. These identity cards were valid for 3 and 5 years in Latvia and Lithuania respectively. When the validity of the card had expired, the technicians would enrol in a 'refresher' course to validate their cards for a further period of time. The identity card system helped to promote business for the trained technicians with clients that valued technicians that were qualified for the work, and helped to exclude those that were unqualified. The finite validity period for the cards ensured that technicians were kept abreast of the latest developments in the best-practice management of ODS and F-gases.

Figure 3: Number of technicians trained in best-practice management of ozone-depleting substances during the project



The data in the figure were derived from Column 9 in Table 3.

146. In this project, a refrigeration association or institute often had a mandate to provide training on an on-going basis. Associations were generally comprised of representatives from refrigeration and air-conditioning companies that valued having personnel that were trained. Associations or Institutes were present in Armenia, Estonia, Latvia, Lithuania and Tajikistan (Table 3, Columns 24 and 25). In the EU CEITs, the associations collected a fee from trainees for providing training services. The associations in the EU countries freed the government from undertaking this role and because they charged a fee it became like any other commercial service for the association. Legislation that mandated 3R and qualifications was also in force in Estonia, Latvia and Lithuania, which was essential for ensuring that the associations had a sustainable business for training personnel.

147. The training and certification scheme was assessed as important to Kazakhstan, Tajikistan and Uzbekistan, as large numbers of technicians were trained. Training continued to some extent after the project was completed in Kazakhstan and Tajikistan. Legislation in the EU on ODS and F-gases was assessed as important for the sustainability of training after the completion of the project in Estonia, Latvia and Lithuania, which showed that regional legislation was important for the sustainability of national training. The associations that operated on a fee-paying basis and with the assistance of legislation that required training were assessed as an important element in promoting the continuity of training after the project was completed.

7.3.1.3 Equipment

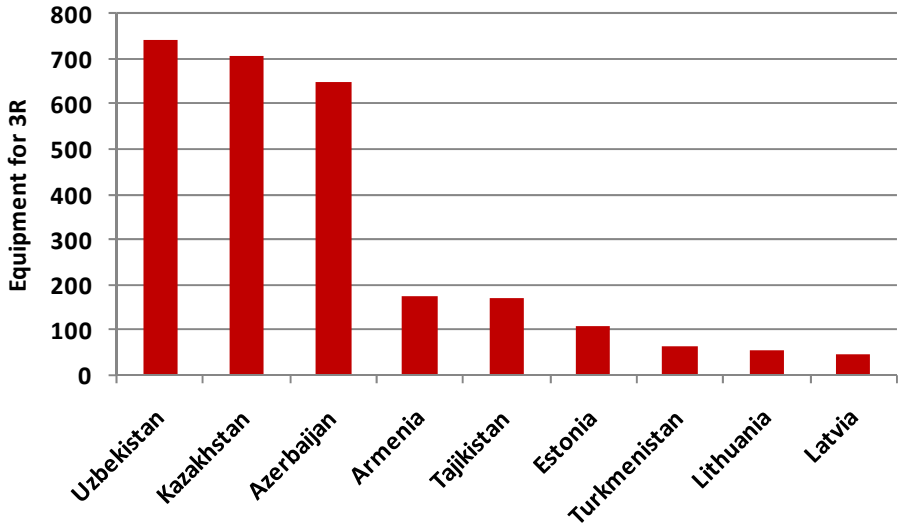
148. The project provided a range of different types of equipment for recovering, recycling and reclaiming as much ODS as possible to meet the servicing demand, thereby avoiding imports of ODS. The quantity of equipment distributed to users in each CEIT is shown in Table 3 (Columns 14 to 18) and summarised in Figure 4. Figure 4 shows that about three times more machines were provided to each of Azerbaijan, Kazakhstan and Uzbekistan than were provided to each of the other six CEITs. Reclamation machines were provided to Estonia, Latvia and Lithuania.

149. The EU CEITs may have received fewer machines in comparison with the other countries since

many of the servicing centres could afford to buy their own and were not dependent on the project to provide machines. In Estonia, for example, the association reported that many companies had already purchased recovery machines. This was not the case in Armenia, Kazakhstan and Uzbekistan where servicing companies dependent on the project to provide machines as companies could not afford to buy them.

150. Four countries (Armenia, Lithuania, Tajikistan and Uzbekistan) maintained a database of each machine and its servicing location. Uzbekistan in particular used the database information to determine the efficiency of ODS recovery (based on the amount recovered per machine), and re-distributed machines from servicing centres that were less efficient to those that were more efficient.

Figure 4: Number of pumps, recovery machines, recovery and recycling machines and reclamation machines provided during the project



The data in this Figure were derived from Columns 14 to 17 in Table 3.

151. Many countries reported that the equipment was no longer functional and in some cases the parts from non-operational equipment had been cannibalised and used to maintain existing equipment. Cannibalising machines was a practical way of overcoming supply deficiencies, or when parts were available of avoiding excessive prices. The machines had lasted for their expected lifetime of about 10 years and there was general satisfaction with their performance during that period of time. However, many companies foresaw the need to recover HCFCs in response to the Parties adjustment of the Montreal Protocol in 2007 that results in their earlier phase out than originally planned. Many companies were uncertain as to whether the machines that had been supplied in the past for CFCs would still be operational in the future for HCFC recovery and recycling.

7.3.1.4 Recovery programmes

152. The recovery and destruction of unwanted domestic refrigerators is important for avoiding emissions of ODS to the atmosphere and for recovering ODS that can be used to meet the servicing demand. In general, each refrigerator contains about 450 g of ODS, with two-thirds of this contained in the insulation foam.

153. Five countries (Estonia, Kazakhstan, Latvia, Lithuania and Uzbekistan) had recovery programmes in place for unwanted refrigerators (Table 3, Column 19). The other four countries did not have a programme in place, which probably results in refrigerators going to landfill sites and ODS being emitted to the atmosphere. Some countries sent their domestic refrigerators to other countries for recovery where commercial facilities were in place. For example, Estonia initially sent its refrigerators to Finland, but later domestic refrigerator recovery programmes were initiated in the Baltic countries and Estonia sent unwanted refrigerators to Lithuania. Countries with recovery programmes rarely recovered or destroyed ODS contained in the insulation foam and most often only recovered ODS from the compressor. This resulted in only about 30% of the ODS being recovered from unwanted refrigerators.

154. Halon used for fire-fighting is one of the most ozone-depleting substances. For this reason, halon production and consumption was halted in developed countries under the Montreal Protocol on 1 January 1994, which was two years in advance of a similar ban on CFCs.

155. Halon was recovered during the project in Estonia and Kazakhstan, and continued after the project finished in Estonia, Latvia and Lithuania (Table 3, Columns 20 and 21). The continuation after the project was promoted by a regional programme based in Estonia that recovered and reclaimed halon in the Baltic countries. The vast majority of the halon was recovered from Estonia, with some shipped from Lithuania and none from Latvia.

156. The recovery of halon after the project did not continue in Kazakhstan mainly because the technicians that were trained in the recovery and reclamation programme were re-deployed in the military. New technicians were not trained. Kazakhstan also has undertaken trials to determine the best way to destroy the recovered halon, and has not investigated the possibility of selling it on the international market.

157. The amount of ODS recovered was determined by a survey undertaken as part of this evaluation that was sent to the NOUs of all the CEITs involved. Although the survey form was completed and returned by all countries, there were no responses on the amount recovered in 2007 from Azerbaijan, Kazakhstan and Turkmenistan.

158. The results in Table 2 show that HCFCs accounted for 56.6% of the total ODS recovered, CFCs 35%, halon 8.2% and other ODS was 0.2%. The predominance of HCFCs could be expected since the quantity of CFCs available for recovery peaked 7-10 years earlier, depending on the country. It was for this reason that the NOUs in some countries commented that the 3R project was initiated too late to recover CFCs as most of them had been emitted several years earlier. For example, in Estonia there was a substantial decline in CFCs from 1995 to 1996 due to the bankruptcy of a company that owned a fleet of twenty large fishing vessels that contained refrigeration equipment that operated on CFCs, including five very large factory ships. There was no report of the CFCs from these ships being recovered, probably because there was no requirement to recover the CFCs at that time.

Table 2: Ozone-depleting substances recovered in Armenia, Estonia, Latvia, Lithuania, Tajikistan and Uzbekistan in 2007 (kg)

ODS	Average	Minimum	Maximum	TOTAL	Percent of Total
CFCs	3,410	-	11,331	20,459	35.0%
HCFCs	5,520	22	14,622	33,117	56.6%
Halon	1,199	-	1,857	4,794	8.2%
Other	33	-	100	100	0.2%

7.3.1.5 Reporting

159. Reporting of the amount of ozone-depleting substances recovered and recycled annually was important for determining the cost-effectiveness of the project, and for determining the extent to which the operations were successful. In some countries such as Uzbekistan, reported data was used as the basis for re-assignment of equipment (see paragraph 150 above).

160. Azerbaijan and Latvia were the only countries that did not provide 3R data for this evaluation; Estonia and Lithuania provided some information; and the remaining countries provided data for the years that the 3R project was operational (Table 3, columns 26 and 27). After the project had finished some countries (Estonia, Lithuania, Tajikistan and Uzbekistan) continued to obtain information from servicing facilities on the amount recovered and recycled. Some countries had contracts with the servicing facilities that obligated reporting, which may have been the reason for continued reporting.

161. Reporting after the project had been completed was most likely encouraged by the requirement for some countries to comply with regional legislation, which was likely to be the case with the countries that were members of the EU. Regional legislation was therefore assessed as important for the sustainability of reporting after the project had been completed.

Blank page for double-sided printing

Table 3: Recovery and recycling of ozone-depleting substances shown according to legislation, training in best-practice management of the phase out of ozone-depleting substances, qualifications, equipment, halon recovery, organisations that assisted in ODS, and reporting

Country	Timing and status			Legislation				Training and certification					Equipment					Recovery			Destruction		Association		Reporting	
1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27
Armenia	O4	O9	A5	No	No	No	No	685	No	No	No	No	100	70	5	0	Yes	No	No	No	No	No	Yes	NR	Yes	NR
Azerbaijan	99	02	A2	No	No	No	No	1101	No	No	No	NR	300	300	50	0	No	No	No	No	No	No	No	No	No	Unkn
Estonia	00	07	A2	Yes	Yes	Yes	No	200	Yes	No	Yes	Yes	50	50	5	1	No	Yes	Yes	Yes	No	Yes	Yes	NR	Most	Yes
Kazakhstan	00	O5	A2	No	No	Yes	No	3365	26	NR	Yes	Yes	50	595	59	0	No	Yes	Yes	No	No	No	No	No	Yes	No
Latvia	97	07	A2	Yes	Yes	Yes	Yes	180	54	3	No	Yes	0	40	2	2	No	Yes	No	Yes	No	Yes	Yes	No	No	No
Lithuania	98	O5	A2	Yes	Yes	Yes	Yes	0	272	5	Yes	Yes	0	50	3	3	Yes	Yes	No	Yes	No	Yes	Yes	No	Some	Yes
Tajikistan	02	O6	A2	Yes	No	No	No	334	Yes	No	No	NR	50	117	5	0	Yes	No	No	No	No	No	No	No	Yes	Yes
Turkmenistan	98	O5	A5	No	No	No	No	366	No	No	Yes	No	30	31	3	0	No	No	No	No	No	No	No	No	Yes	No
Uzbekistan	98	O7	A2	Yes	Yes	No	No	1648	No	No	Unkn	Yes	300	430	12	0	Yes	Yes	No	No	Yes	No	No	Yes	Yes	Yes

	Project Start	Project end	Categorisation in Montreal Protocol	Legislation that mandates 3R	Legislation for reporting on 3R	Legislation for Qualification requirements	Unqualified penalised	Trained during Project	Training before or since Project	Validity of "Greencard" (years)	Certificate	Technicians paid for training after the Project	Manual pumps	Recovery machines	Recovery and recycling machines	Reclamation machines	Machines database	Refrigerator recovery during or after	Halon recovered during the Project	Halon recovered after the Project	Destruction capability i?ide country during or after Project	Destruction outside during or after the Project	Association	Institute or other similar to Association	RRR results during Project	RRR results after Project
1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27

Blank page for double-sided printing

7.3.2 Methyl bromide Regional Programme

162. There was no possibility for the cost-effective recovery and recycling of methyl bromide for pre-harvest or post-harvest operations in this programme. Methyl bromide has been recovered in facilities that perform quarantine and pre-shipment treatments primarily to avoid accidentally injuring or killing port workers that opened shipping containers on arrival that had been fumigated in the country of origin. Since QPS treatments were specifically excluded from this regional programme, recovery of methyl bromide was neither envisaged nor implemented.

7.4 Control of illegal trade in ozone-depleting substances

163. The large volume of legitimate ODS trade that takes place for exempted and legal uses provides cover for illegal trade. One study[21] calculated that more than 24,000 legitimate trans-boundary shipments of ODS occurred in 2004, so Customs officers face a complex task of differentiating legal from illegal shipments.

164. Illegal trade in ODS can arise in many forms[22]. For example, ODS containers can be disguised to give the appearance of transporting non-ODS substances. Traders can attempt to import or export ODS without licenses, using false descriptions in Customs documents. In other examples, traders have pretended that ODS were going to be exported legitimately from industrialised to developing countries (where the phase-out date is later) but in fact they exported empty cylinders, and sold the ODS illegally in industrialised countries[23].

165. The expected outcomes from the Customs training sub-project included a border that was made sufficiently secure against illegal trade in ODS due to the training of sufficient customs officers in the detection of ODS and ODS-containing equipment; equipment provided to officers to detect ODS; records of illegal imports being intercepted; and penalties in place for illegal trade that would discourage smugglers.

166. The ability of a country to combat illegal trade in ODS depends on a number of factors:

1. The number of Customs and other staff that have been trained to detect illegal trade in ODS;
2. The equipment available to Customs and other officers that enable them to distinguish between illegal and legal ODS and ODS-containing equipment;
3. Cooperation between Customs and other agencies to share intelligence on illegal trade and interceptions of illegal trade in ozone-depleting substances;
4. Legislation that includes Penalties applied to those that are caught undertaking illegal trade.

167. The extent to which each of these outcomes had been achieved in each of nine CEITs was examined, and the results are summarised in Table 6.

7.4.1.1 Training of customs officers

168. All of the CEITs trained Customs officers during the Project (Table 6, Column 6 on page 49). Some countries commented that the training was not delivered sufficiently early to combat imports of illegal CFCs that undermined their earlier ODS reduction phase out activities. Ideally, it would have been better to have trained the Customs as a separate sub-project before the projects commenced, as then the first line of defence would be in place right from the start of the projects.

169. Twenty five percent of CEITs delivered training on reducing illegal trade in ODS to Customs officers in the past 3 years, after the Project was completed. For example, Azerbaijan, Bulgaria, and Hungary followed up with training after the Project (Table 6, Column 7), which indicated that their Customs training was more sustainable than in 75% of the CEITs that either undertook no follow up training of Customs (5 countries) or follow up training was unknown to the evaluators

---

[21] EIA & Chatham House. (2006). ODS Tracking: Feasibility study on developing a system for monitoring the transboundary movement of controlled ozone-depleting substances between the Parties. Report produced under Decision XVII/16 of the Montreal Protocol. Retrieved from Ozone Secretariat: http://ozone.unep.org/Meeting_Documents/mop/18mop/ODS-Tracking-September-2006-1.pdf

22 UNEP. (2009). Dialog Concept Note. China ECA Dialog on Cooperation in Border Enforcement and Joint Training/Consultation of Customs Officers. 23-25 June 2009. Urumqi, China: UNEP DTIE

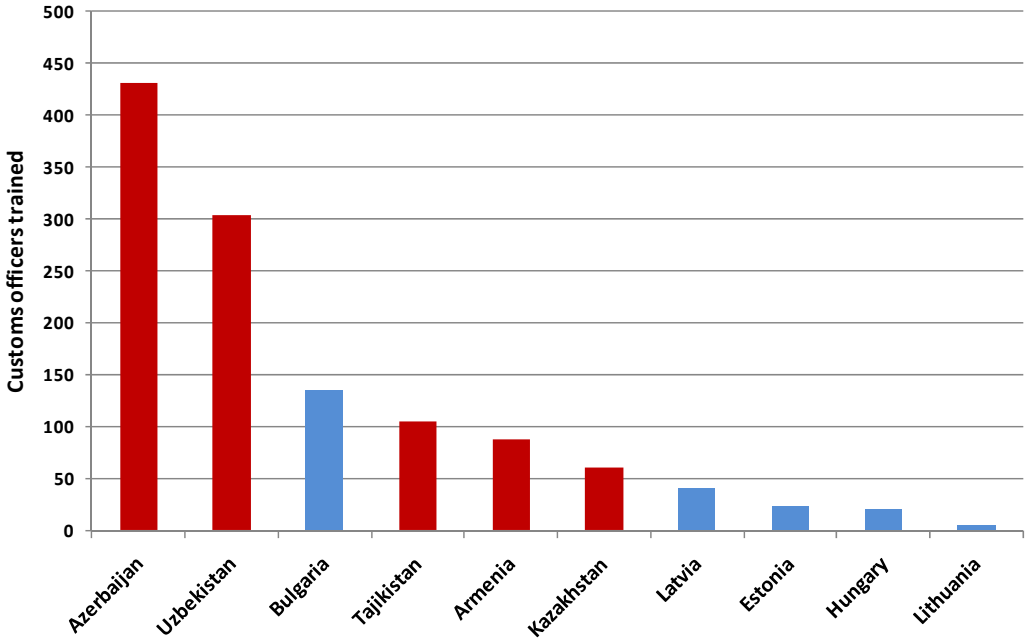
[23] UNEP. (2001). Illegal Trade in Ozone Depleting Substances. OzonAction Newsletter Special Supplement. No 6. Paris: UNEP DTIE OzonAction

(4 countries).

170. For the follow up training, the CEITs sought support for customs training from external sources, where this was possible. For example, Bulgaria obtained finance from an EU fund, and Hungary hosted the UNEP Green Customs meetings on two occasions. These countries saw the value in having a border that was as secure as possible against illegal imports of ODS. This became particularly important for Bulgaria and Hungary that became responsible for a part of the EU border for the EU market as a whole, not just for the markets of Bulgaria and Hungary. ODS and ODS-containing products that that are illegal or legal once inside the border of the EU have free movement within the EU territory of 27 Member States, which places additional responsibility on border states for EU customs security.

171. In the nine CEITs there were 1,212 officers trained during and after the project, the majority of them in the non-EU-CEITs (81.5%) (Table 6, Column 8; Figure 5). Azerbaijan alone was reported to have trained about one third of the total Customs officers in the nine CEITs.

Figure 5: Number of customs officers trained in non-EU-CEITs (red) compared to EU-CEITs



172. The large number of customs officers trained in the non-EU-CEITs may reflect the increasing importance that the Parties have placed recently on combating illegal trade in ODS. Illegal trade and ways to combat it have been discussed by the Parties to the Montreal Protocol in their annual meetings more times in the last nine years than in the previous ten. The first Decision by the Parties on illegal trade was in 1995. Illegal ODS trade in CEITs became a cause of serious concern during the 1990s[23]. During the mid-1990s most of the ODS illegally entering Europe and the USA was believed to have originated in Russia[23], and cases of illegal trade in CFCs manufactured in Russia were detected in Estonia, UK, USA and other countries[24]. The Parties to the Montreal Protocol have agreed three times as many decisions on illegal trade in the past eight years as they have in the previous twelve, which indicates that level of concern held by the Parties.

173. It was not possible to determine the percentage of officers trained to detect illegal trade in any country, as in many countries the total number of Customs officers is kept confidential. In some countries, remarkably few were trained. For example, Lithuania only has 5 trained, but the government reported that the Customs officers that were trained went back to their check points and passed on the information to their colleagues. Kazakhstan reported that the number trained were fewer than was considered appropriate for detecting illegal trade along a long border.

---

[24] EIA. (2008). Environmental Crime: A Threat To Our Future. ISBN 0-9540768-5-0. London: Environmental Investigation Agency. Page 15.

7.4.1.2 Equipment for detecting ozone-depleting substances

174. Refrigerant identifiers were procured by for participating countries by UNDP for detecting ODS by Customs officers at the border. Customs was equipped with identifiers in all countries except Latvia and Lithuania (Table 6, Column 9).

175. Kazakhstan reported that 100 identifiers were provided to its Customs officers, which was 42% of the total number of identifiers (238) provided to the nine CEITs. However, Customs officers in Kazakhstan reported that the identifiers were not particularly reliable as they sometimes gave false positives, they sometimes did not have the support from a scientific laboratory to confirm the refrigerant identified at the border, and they were not able to identify blends of ODS and HFCs. This reduced the effectiveness of the identifiers as one of the tools to combat illegal trade.

7.4.1.3 Cooperation and interceptions of illegal trade in ozone-depleting substances

176. One of most effective techniques used to combat illegal trade is through sharing of intelligence information between agencies with the Customs service. Four of the EU-CEITs (Bulgaria, Estonia, Hungary and Lithuania) and two non-EU-CEITs (Armenia, Uzbekistan) reported that information was shared every 3-12 months, according in most cases to a legislative requirement (Table 1, Column 6 on page 36). Sixty-seven percent of the CEITs reported that the Customs service worked with other agencies, typically the Inspectorate (Table 1, Column 6 on page 36). Some countries such as Kazakhstan and Uzbekistan reported that they focused more on some countries than others, based on their experiences with illegal trade in the past, which assisted them to intercept illegal trade in ODS more effectively.

177. There were also regional meetings to share information on illegal trade between countries. The World Customs Organisation (WCO) Regional Intelligence Liaison Office (RILO) serves as the focal point of intelligence analysis and liaison enforcement cooperation with Member administrations in Asia and the Pacific region. RILO collects, collates, evaluates and disseminates information on customs offences to the offices in the region, and periodically produces bulletins containing seizures of global and regional relevance, trend analyses and analytical reports.

178. Most of the CEITs have intercepted illegal trade in ODS since 2002, and particularly in illegal ODS trade originating from Asia which has become more frequent in non-EU-CEITs. The reported cases by the Customs agencies are relatively small-scale, in contrast to the large amounts of CFCs available on the market in Central Asian countries. This indicated large-scale smuggling of ODS that must have by-passed border security[25].

179. Table 4 provides examples of illegal trade. Note that a large number of reported cases (notably in Uzbekistan) often indicated that a country was more vigilant in monitoring for illegal trade than countries that reported few cases of illegal trade.

Table 4: Examples of illegal ozone-depleting substance trade reported in CEITs since 2002

Country	No. of reported events	Implied sources of ODS	Substances	ODP-tonnes	Tonnes	Year(s) of events
Armenia	2	Saudi Arabia, United Arab Emirates	CFC	Unknown	Unknown	2007?
Estonia	13	Estonia, other not stated	Halon, HCFC	> 2.404	> 0.470	2005, 2007?
Kazakhstan	1 + reported risk	Russia, China	CFC, HCFC	> 0.006	> 0.110	2007, 2009
Poland	> 2	Ukraine	HCFC, CFC	> 0.150	> 0.150	2005?
Tajikistan	several	Not stated	CFC mainly	Unknown	Unknown	Unknown
Turkmenistan	1 + reported risk	Not stated	CFC, other?	Unknown	> 1.224	2006, 2009
Uzbekistan	> 21	China, Kyrgyzstan, Uzbekistan	CFC, HCFC, MB, other	Unknown	> 1.764	2002-2008

MB = methyl bromide; TCE = trichloroethylene; Source WCO and RILO

[25] UNEP. 2009. Concept Dialog Note. Urumqi, China.

180. Many of CEITs reported incidences of illegal trade, and even the price of CFCs on the local black market. Illegal trade was unlikely in the EU-CEITs, mainly because CFC-based equipment is rare and there is little demand, rather than the vigilance per se of the Customs and other agencies at the border.

181. In contrast, illegal trade was likely in all of the Non-EU-CEITs, except for Armenia and Turkmenistan that are Article 5 and trade in virgin CFCs is still legal in 2009 within the consumption limits of the Montreal Protocol.

7.4.1.4 Legislation and penalties

182. Under the Montreal Protocol, most countries have adopted licensing systems intended to regulate the type and quantity of ODS imports and exports. Analysis of the survey questionnaire showed that 100% of the EU-CEITs reported that a licensing system for ODS was in place, compared with 89% of the Non-EU-CEITs. The Montreal Protocol requires all countries to have a licensing system. However, to have an *effective* licensing system in place, it is necessary to put in place quotas that act to restrict the quantity of ODS that can be imported, and to have procedures in place for allocating the quota system equitably.

183. In this respect, an analysis of the survey questionnaire showed that 100% of the EU-CEITs reported that quotas for ODS were in place. All of the Non-EU-CEITs responded except for Armenia. Of those that responded, Azerbaijan, Tajikistan, Turkmenistan and Uzbekistan reported that a licence system for ODS was in place.

184. All EU-CEITs reported that they had penalties that could be applied to traffickers of ODS that were found guilty of illegal trade, but only Kazakhstan and Uzbekistan amongst the Non-EU-CEITs reported that they had the ability to impose fines (Table 6; Column 11). Penalties under EC legislation that have been transposed into national legislation in the EU-CEITs are required to be "…*effective, proportionate and dissuasive*". As a result, some EU-CEITs impose jail sentences as well as fines for those found culpable of illegal trade in ODS.

185. The penalty for illegal ODS trade in one of the Non-EU-CEITs (Uzbekistan) was assessed as insufficiently dissuasive, and therefore unlikely to discourage illegal ODS trade. Uzbekistan reported that it was revising its penalty system for illegal ODS trade. In the meantime, the Customs in Uzbekistan reported that the fine was not as important as the disruption to the business of the violators because of the increased number of checks on them conducted by Customs.

186. Analysis of the survey questionnaire showed that all of the CEITs reported that they had legislation in place to combat illegal trade, except for Armenia that did not respond to any of the questions on illegal trade. Of those that responded, all EU-CEITs (Estonia, Latvia and Lithuania) reported that they had in the past returned confiscated ODS to the country of origin, compared with 22% (Azerbaijan, Tajikistan) of the Non-EU-CEITs that did so; and only Uzbekistan destroyed confiscated ODS, but using a method that was costly and slow.

7.4.1.5 Risk of illegal trade

187. The evaluation assessed the risk of Illegal trade (Table 5) for each of the CEITs based on interviews with the NOUs in all except Lithuania, the Customs services and inspectorates in some countries as well as servicing operations in many countries; and the information contained in Table 1 (Institutional Strengthening, columns 5-7) and Table 6 (Illegal trade, Columns 6-11) that affected the ability of the Customs Agency and sometimes the Inspectorate to combat illegal trade. This resulted in one country assessed as a moderate risk of illegal trade in ODS entering the market (Uzbekistan), three countries as high risk (Kazakhstan, Tajikistan and Turkmenistan) and the remaining CEITs as low risk. The countries and reasons for these assessments are provided in Table 5.

188. One of the main problems facing Customs officers is the large number of categories of ODS that have not been phased out but are still permitted, either because the ODS is not controlled in the Montreal Protocol, or there is an exemption for some Parties and uses and not others. For example, there are restrictions on some refrigerants as fluids, but not if the fluids are contained within equipment as the Parties elected to control ODS at the source, rather than in the equipment. There are exemptions for ODS used as feedstock and process agents, because

feedstock is consumed and not emitted, and process agents are used under controlled conditions with emission restrictions. Some uses are permitted without quota restrictions e.g., methyl bromide for quarantine and pre-shipment (QPS), but banned in developed countries for non-QPS uses and not banned in developing countries for the same uses until 2015. It is almost impossible for the Customs officers to be fully conversant with all the nuances of ODS cross-border and to ensure that all transactions are compliant with the Montreal Protocol. Instead, Customs officers must rely on their knowledge of the legislation in each country and must take a decision to deny or allow import-export based on this knowledge. Training of Customs officers was therefore seen as a high priority by the many of the governments in the CEITs.

Table 5: Risk of illegal trade in ozone-depleting substance after 2010

Country	Assessment	Reason for assessment
Armenia	Low	- Article 5 country with imports declining, and effective recovery and recycling programme; - Officers recently trained
Bulgaria, Estonia, Hungary, Latvia, Lithuania, Poland	Low	- Legislation in place with dissuasive penalties - Trained customs officers with detection equipment and inter-agency communication - New legislation on ODS in EU countries requires country profiling
Azerbaijan	Low	- Frequent communication between NOU and Customs; - Large number of trained officers
Kazakhstan	High	- Relatively few customs officers trained to detect ODS; rarely used detection equipment, lack of knowledge by Customs of ODS legislation, few interceptions ODS and bribery of customs officers
Tajikistan	High	- Some trained customs officers but fast rotation so knowledge of ODS detection lost; - Large demand for CFCs because of old equipment and insufficient funds for CFC-free replacements - Insufficient recovery and recycling programme which contributes to 10% of the CFCs required
Turkmenistan	High	- Poor interagency coordination with Customs; - Few trained officers; - Identifiers not with Customs; - Cannot afford to replace CFC-based equipment; - Reports of cheap CFCs on the market - Recovery and recycling programme left weakened by staff that have left the country; - Licence system and quotas not in place
Uzbekistan	Moderate	- Legislation in place to penalise those engaging in illegal trade; - Penalties being strengthened; - Trained customs officers with detection equipment and inter-agency communication; - Good record of interceptions of illegal trade in ODS

Blank page for double-sided printing

Table 6: Prospects of illegal trade in ozone-depleting substances based on an analysis of the number of Customs officers trained, illegal imports and established penalties

COUNTRY	Legislative driver	Developed (A2) or Developing (A5) country	Project Start	Project end	Training of customs officers during project	Training of customs officers after Project	Total number of customs officers trained	Refrigerant identifiers	Illegal imports intercepted in last 3y	Penalties for illegal trade	Risk of illegal trade after 2010
1	2	3	4	5	6	7	8	9	10	11	12
Bulgaria	EU	A2	1995	2000	Yes	Yes	135	32	No	Yes	Low
Estonia	EU	A2	2000	2007	Yes	No	24	Yes	Yes	Yes	Low
Hungary	EU	A2	1995	1998	Yes	Yes	20	Yes	No	Yes	Low
Latvia	EU	A2	1997	2007	Yes	No	40	No	Unknown	Yes	Low
Lithuania	EU	A2	1998	2005	Yes	No	5	No	Unknown	Yes	Low
Poland	EU	A2	1997	2001	Yes	Unknown	Unknown	40	Unknown	Yes	Low
Armenia	Non-EU	A5	2004	2009	Yes	Unknown	88	12	No	Unknown	Low
Azerbaijan	Non-EU	A2	1999	2002	250	180	430	13	Yes	Unknown	High
Kazakhstan	Non-EU	A2	2000	2005	Yes	Unknown	61	100	Yes	Yes	High
Tajikistan	Non-EU	A2	2002	2006	105	Unknown	105	22	Likely	Unknown	High
Turkmenistan	Non-EU	A5	1998	2005	Yes	No	Unknown	Yes	Yes	Unknown	High
Uzbekistan	Non-EU	A2	1998	2007	Yes	No	304	19	Yes	Yes	High

Blank page for double-sided printing

7.5 Investment in technology that eliminated ozone-depleting substances

189. The expected outcomes from the investment in non-ODS technology included a phase out of ozone-depleting substances by the various users according to targets specified in project documents; conversion of facilities consuming ODSs to non-ODS technologies with equipment and know-how; and, if possible, improved profitability for the company involved as well as downstream suppliers.

190. There were no UNDP investment projects implemented in Estonia or Turkmenistan. The extent to which each of these outcomes had been achieved in Armenia, Azerbaijan, Bulgaria, Hungary, Kazakhstan, Latvia, Lithuania, Poland, Tajikistan and Uzbekistan was examined. The results are summarised in Table 7 and discussed in the following five sectors: Domestic refrigerator production, aerosols, foam, solvent and methyl bromide.

191. The success within each sector was measured according to:

- Whether or not the companies had achieved the phase out target specified in the project document;
- The cost-effectiveness of the phase out, compared with the cost-effectiveness of the installation of CFC-free technology in other parts of the world;
- Whether or not the companies were still operational and had increased their production as a result of the conversion;
- Whether or not the companies had access to spare parts to maintain the equipment that allowed continuity of their operations;
- Whether or not the companies had improved their profitability, for the company involved as well as downstream suppliers, as a direct result of the project to phase out ODS.

7.5.1 Domestic refrigerator production

192. Domestic refrigerator and compressor producers in six countries received funding from the GEF/UNDP for the conversion of their facilities to non-CFC technology: Armenia ("Saga" refrigerators), Azerbaijan ("Chinar" refrigerators and "Sumgait" compressors), Lithuania ("Snaige" refrigerators and "Oruva" compressors), Tajikistan ("Pamir" refrigerators) and Uzbekistan (Sino refrigerators). The details of these companies and their phase out of ozone-depleting substances are given in Section 8: Project Performance, impact, evaluation and ratings. The key features of the companies are summarised in Table 7.

193. All of the companies achieved their phase out reduction targets that were stated in the Project Documents, resulting in overall 275.6 ODP-tonnes of ODS being phased out from 1998 to 2007. The two compressor companies (Sumgait in Azerbaijan and Oruva in Lithuania) were not subject to ODP phase out targets as by convention their targets were excluded to avoid double-counting of ODP phase out with refrigerator manufacturers.

194. The total funding by GEF/UNDP for the implementation of CFC-free refrigerator and compressor production in these six countries was $6.718 million. Based on the phase out of 275.6 ODP-tonnes of ozone-depleting substances, the cost-effectiveness was $24.38 ODP-kg per year. The cost-effectiveness of the installation of CFC-free technology for domestic refrigerator production was compared with the cost-effectiveness of similar projects carried out in developing countries. The MLF financed the evaluation of 28 companies in 11 countries in Africa, Latin America and Asia, which was 20% of the total number of 144 refrigeration projects completed by February 2000. The average planned cost-effectiveness of these MLF-funded projects was $21.69 ODP-kg per year[26]. The overall cost-effectiveness of $24.38 ODP-kg per year in the *ODS portfolio* was therefore similar to the cost of the phase out of ozone-depleting substances in domestic refrigerator production projects that had been carried out in developing countries.

195. As a measure the longer term value of the initial GEF/UNDP funding, the evaluation determined whether or not the facilities that were funded were still operational. For some projects, they

[26] MLF. 2000. Final report on the 1999 evaluation of refrigeration projects and draft follow-up action plan. UNEP/OzL.Pro/ExCom/30/5. Annex 1, page 2: Overall Rating of Refrigeration Projects Evaluated.

finished seven years ago, whereas some finished in 2009. Both compressor production facilities were not operational. The Oruva facility in Lithuania reported that it had entered bankruptcy procedures[27] and that liquidation of the company had commenced on 4 March 2009. UNOPs reported that Oruva was being managed by a Bankruptcy Administrator as early as 2001, and since that time the company has had difficulty manufacturing compressors.

196. Sumgait in Azerbaijan had a capacity to produce about 1 million compressors per year. Total annual compressor sales declined from 976,000 in 1993 to about 100,000 in 1996. The decline was attributed to Sumgait's CFC-free compressors being uncompetitive in an open market situation, due to their inferior quality (noisy and short life) compared to compressors produced in other countries. Sumgait eventually went into bankruptcy as their regular clients purchased compressors from other sources.

197. Although all of the refrigerator production facilities were operational except the Pamir facility in Tajikistan, some that were operational producing fewer refrigerators than in the past. For example, in the early 1990s SINO made about 210,000 refrigerators per year, but the Soviet market collapsed in the mid-1990s and production fell to less than 28,000 refrigerators per year. Since 2003, Sino has produced on average 4,760 refrigerators per year. The funding by UNDP was based on 250,000 refrigerators per year and was ten-fold over-budgeted given production levels at the time of project formulation and produced today. Sino has plans to increase capacity and the number of models in the near future.

198. For the period 1964 to 1995, Pamir in Tajikistan averaged about 105,000 domestic refrigerators per year. This was reduced to about 1,500 units per year in 1995 due to the poor domestic economy. Pamir refrigerators could not compete with imported refrigerators available at the market from 2001 to 2005 in Tajikistan because of their high energy consumption and outdated design. Pamir's production and energy costs were also very high because of old and worn out equipment, despite inputs from UNDP and other bilateral donors. Production eventually stopped in 2006 and the enterprise went bankrupt.

199. In 2008 Chinar in Azerbaijan produced 15,000 domestic refrigerators and freezers, which was much lower than 350,000 units produced annually prior to 1998 when the project was being formulated. At the time of the evaluation, some of equipment used to produce the refrigerators was dismantled and only two of four assembly lines were working. Chinar was experiencing cash flow difficulties, and it could no longer afford to purchase raw materials and to pay for routine maintenance of imported foam equipment.

200. On the other hand, some GEF/UNDP funding had a more positive outcome. The Snaige refrigerator production facility in Lithuania expanded its operations through being able to market energy-efficient CFC-free models on the EU market and internal and acquisitive based growth after the GEF/UNDP investment. Snaige reported that the initial funding allowed them to capture market share which enabled growth therefore demonstrating a catalytic effect. The company increased the number of employees and there was an increase in downstream suppliers of materials to Snaige. Similarly, Saga in Armenia produced about 3,000 display cases, chest freezers and bottle coolers in 2007, as well as sandwich panels. The company became one of the most important manufacturers of commercial refrigeration and panel equipment in the Caucasus region, as the conversion to CFC-free, energy-efficient technology provided the basis for exports to Georgia, Kazakhstan and Russia.

7.5.2 Aerosol production

201. Aerosol producers in Armenia, Latvia and Lithuania received funding from the GEF/UNDP for the conversion of their facilities to non-CFC technology: Armenia ("Yerevan" Aerosols), Latvia ("Kvadro" Aerosols), and Lithuania ("Vilnius" Aerosols). The details of these companies and their phase out of ozone-depleting substances are given in Section 8: Project Performance, impact, evaluation and ratings. The key features of the companies are summarised in Table 7.

202. All of the companies achieved their phase out reduction targets that were stated in the Project Documents, resulting in overall 265.3 ODP-tonnes of ODS being phased out from 1997 to 2009.

203. The funding by GEF/UNDP for the implementation of CFC-free aerosol production at Kvadro in

[27] Court Proceedings of 24-09-2008, which came into force on the 07-10-2008.

Latvia could not be determined. At the time of Project formulation, Kvadro accounted for only about 2% of the consumption of CFCs in Latvia in the aerosol sector. The other two companies ("Aerosols-1" and "Lars-M") were the original targets for the GEF funding at the time as they consumed about 50% of the CFCs in the aerosol sector, but they went bankrupt while the project was being formulated. The equipment for that was intended for installation in the other company was instead installed at Kvadro but the overall cost for the installation was not made available.

204. Based on the phase out of 260.3 ODP-tonnes of ozone-depleting substances at the Yerevan and Vilnius aerosol producers for a funding of $696,000, the cost-effectiveness was $2.64 ODP-kg per year. The cost-effectiveness of the installation of CFC-free technology for aerosol production was compared with the cost-effectiveness of similar projects carried out in developing countries.

205. The MLF reported no clear correlation between the size of an aerosol project and its cost-effectiveness, neither in relation to the volume of funding nor the CFC consumption phased out[28]. The MLF also reported a rather wide range of values for the actual cost-effectiveness, from less than $1.00 to almost $9.00 ODP-kg per year. The average was approximately $3.00 ODP-kg per year, for quantities phased out up to about 100 ODP-tonnes per year. The 35 projects evaluated by the MLF were 45% of all 77 aerosol projects that had been completed by the end of 2001, and 32% of 108 aerosol projects approved by the MLF's Executive Committee by July of 2002. The overall cost-effectiveness of $2.64 ODP-kg per year in the *ODS portfolio* for aerosol producers was therefore less than the average cost-effectiveness of the phase out of ozone-depleting substances in aerosol projects financed by the MLF in developing countries.

206. As a measure the longer term value of the initial GEF/UNDP funding, the evaluation determined whether or not the facilities that were funded were still operational. The Yerevan aerosol factory in Armenia was only operational in the summer when it contract-filled engine degreasing aerosols. In the past the company manufactured a wide range of aerosol products (hair spray, insecticide, technical silicone and deodorants), cleaning agents, laundry detergents and other household chemicals. In 2002, the company was in full operation and working well. In 2009, the company had changed the physical layout of the plant so that it no longer complied with the specifications that were signed over in the UNDP project completion report. In addition, a shortage of finance prevented routine maintenance and purchase of supplies such as ceolyte for destenching columns. The company was only partially viable and did not have in place a strategy for improving its financial position.

207. The Kvadro facility in Latvia doubled its production since the end of the Project in 2001 and attributed this increase in production to the GEF/UNDP funding. In Lithuania, Aerosol Baltija purchased Baltic Chemicals International (previously "*Vilnius*") in 2004 and reported increased sales of aerosol products in 2007 and 2008. It was not possible to relate this recent increase in sales to the GEF/UNDP funding of the phase out of CFCs. These companies reported no difficulties in obtaining spare parts for the equipment that had been installed as a result of the project. The Kvadro factory had not increased employment as a result of the Project as most of the equipment was semi-automated and required few staff for its operation.

7.5.3 Production of foam products

208. Foam product producers in Latvia and Kazakhstan received funding from the GEF/UNDP for the conversion of their facilities to non-CFC technology: Latvia ("*Ritols*" spray foam) and Kazakhstan ("*Trademarket*" rigid and flexible foam). The details of these companies and their phase out of ozone-depleting substances are given in Section 8: Project Performance, impact, evaluation and ratings. The key features of the companies are summarised in Table 7.

209. Two of the companies achieved their phase out reduction targets that were stated in the Project Documents, resulting in an estimated 139 ODP-tonnes of ODS being phased out from 1997 to 2007, instead of the target of 148 ODP-tonnes. The full target was not achieved because the rigid foam operations in Kazakhstan were converted from CFCs to HCFCs, rather than to ODS-free technology as agreed in the contracts with the operators and as specified in the Project Document.

[28] MLF. 2002. Final report on the evaluation of aerosol products. UNEP/OzL.Pro/ExCom/38/5/Corr.1. See Annex III for cost-effectiveness.

210. Ritols in Latvia replaced CFCs with a water-blown system for the production of rigid polyurethane spray foam insulation. The cost-effectiveness was $8.15 ODP-kg per year, based on a project cost of $106,000 to phase out the consumption of 9.72 ODP tonnes of CFCs per year. The MLF (2001) reported that the cost-effectiveness of 5 polyol (spray) foam projects completed in developing countries averaged $0.54 ODP-kg per year[29]. The cost-effectiveness of the sub-project to phase out the use of CFCs in Ritols was assessed as about 20-times more expensive as the average cost-effectiveness of the conversion to CFC-free technology in polyol (spray) foam projects financed in developing countries by the MLF.

211. The conversion away from CFCs as a result of the project at the Ritols plant in Latvia promoted its long term sustainability. Ritols operations continued 4-5 days per week in 2009 despite the economic crisis, as their work mostly involves improving the insulation of existing rather than new buildings. The Ritols facility particularly valued contacts that the company had made with EU counterparts as a result of the Project, in particular being a partner in a major EU research programme[30] which aimed to use plant rather than petrochemical sources for polyurethane foam.

212. Trademarket is a privately-owned Systems House that in 1998 supplied 16 companies (680 workers in total) with chemicals for the manufacture of small-scale rigid and flexible insulation foam in Kazakhstan.

213. Rigid foam applications included thermal insulation for cold rooms, refrigerators and display cabinets; and foam for insulating pipes used in the oil industry and central heating schemes. The project paid for the replacement of CFCs with non-ODS water-based foam blowing technology. The cost-effectiveness of the programme was assessed in the Project Proposal as $9.87 / ODP-kg per year, on the basis of an incremental cost of $1,035,363 to the manufacturers and a reduction of 104.9 ODP-tonnes of CFCs per year. After the project was completed, Trademarket reverted to ODS technology by supplying HCFCs to most of its clients for the production of rigid foam.

214. Ten of the remaining manufacturers out of the initial fourteen in the sub-project reverted to HCFC-141b for foam blowing, which has an ODP of 0.11 compared with CFCs that have an ODP of 1.0, the efficiency would in theory be about 11% higher as about 11% of the ODS that should have been phased out still remained. The theoretical cost-effectiveness was therefore equivalent to about $10.96 / ODP-kg. However, the assessment team was informed that some but not all of the manufacturers reverted to HCFC-141b, so the efficiency would be between $9.87 to $10.96 / ODP-kg. The MLF threshold for the sector was $7.83 / ODP-kg but the manufacturers were paid more to partially compensate for increased operational costs incurred as a result of the installation of water-based technology instead of the much cheaper operating costs involved when using HCFC-141b.

215. Trademarket also supplied CFCs to 24 companies for the manufacture of flexible foam. The Project replaced the use of CFCs with a combination of methylene chloride and low-index-additive technology, which also aimed to improve OH&S and environmental performance. The cost-effectiveness of the programme was assessed in the Project Proposal as $6.34 / ODP-kg per year, on the basis of an incremental cost of $285,120 to the manufacturers and a reduction of 45 ODP-tonnes of CFCs per year. The MLF (2001) reported that the cost-effectiveness of 71 flexible slabstock foam projects that were completed in developing countries averaged $6.23 ODP-kg per year[31]. In Kazakhstan during project formulation, 18 of the manufacturers went bankrupt leaving only 6 in the project. The cost-effectiveness would therefore have been closer to $20.00 / ODP-kg per year which was well above the MLF threshold of $6.23.

216. As a measure the longer term value of the initial GEF/UNDP funding, the evaluation determined whether or not the facilities that were funded were still operational. Trademarket reported that about 5 years after the sub-project was completed, four of the companies that produced rigid foam went bankrupt as they were not able to absorb the costs of re-location when the land they rented was sold. Some of the remaining companies that produced rigid foam ended their use of the water-based system and instead implemented HCFC-141b, as they reported this improved the foam's insulation quality. About 2 years after the sub-project was completed, most of the

[29] MLF. 2001. Final Report on the Evaluation of Foam Projects. UNEP/OzL.Pro/ExCom/33/6. Table 12 on page 18.
[30] EU 7th Framework Programme FORBIOPLAST
[31] MLF. 2001. Final Report on the Evaluation of Foam Projects. UNEP/OzL.Pro/ExCom/33/6. Table 12 on page 18.

companies that produced flexible foam also went bankrupt. The change to low-index-additive technology increased the price of the flexible foam in Kazakhstan which could not compete with cheaper Russian imports that in 2009 accounted for 90% of the flexible foam market in Kazakhstan.

217. Approximately 25% of the GEF funds in Kazakhstan were directed toward the elimination of ozone-depleting substances use in the rigid (20% of the funds) and flexible (5% of the funds) foam-producing companies. Some of the companies in the rigid foam production did not adhere to their contractual obligations that required only the use of ODS-free technology, but instead reverted to HCFC-blown foam after the sub-project was completed.

7.5.4 The use of ODS-free solvents

218. There was only one solvent project in the *ODS Portfolio* which was the replacement of the use of CFCs at the Pavlodar Chemical Company (PCC) in Kazakhstan. This company was a former chemicals weapons production facility[32] that today produces a range of civilian chemicals including caustic soda, chlorine, sodium hypochlorite, ammonium chloride, lubricating oil additives, flotation agents, antifreezes, phenol-formaldehyde resins, and plasticizers for PVC resins. Parts of this plant are now owned by private companies and investors, including JSC "Kaustic" (since 2007) and Reagent-Vostok for the operational parts of PCC. Russian funding of the plant ceased in 1992 after Kazakhstan became independent. The main chlorine production line was closed in 1993 because it was based on mercury electrolysis, and it was forced to buy chlorine more expensively for synthesising other chemicals from the Russian Federation. Many of PCC's products are now made more cheaply in Russia. The plant was closed twice due to bankruptcy from 1996 to 2000, and more recently in 2007 until part of it was bought by Kaustic.

219. PCC received funding for the replacement of CFC-113 with another solvent methylene chloride. Methylene chloride is used to remove oil contaminants, including acetylene from various oxygen-producing systems that, if not removed, could cause an explosion. The funding also paid for a machine to recover and reclaim the methylene chloride. PCC's phase out of CFC-113 is given in Section 8: Project Performance, impact, evaluation and ratings. The key features of the phase out of CFC-113 by PCC are summarised in Table 7.

220. The equipment installed as a result of the project may not be used commercially because it has not been certified by the local authorities. Certification was expected to cost $150,000 to $180,000, which was much more than the GEF budget of $106,920. Certification could only be performed by a specialised research centre that was accredited to conduct '*sanitary, technical and epidemiological tests*'.

221. The cost-effectiveness of the project to replace CFCs with methylene chloride at the PCC was $17.82 ODP-kg per year, based on a project cost of $106,920 to phase out the consumption of 6 ODP tonnes of CFCs per year. The MLF (2001) reported the average actual cost-effectiveness of nine solvent projects completed in developing countries was $14.92 ODP-kg per year[33]. The cost-effectiveness of the sub-project to phase out the use of CFCs at PCC was assessed as about 20% more expensive than the average actual cost-effectiveness of the conversion to CFC-free technology for projects financed in developing countries by the MLF. The cost-effectiveness of the project was, however, within the MLF cost-effectiveness threshold for project funding of $19.73 ODP-kg per year[34]. If the costs of certification had been included in the project, the cost-effectiveness of the project would have exceeded the reported average cost-effectiveness of projects on the replacement of ODS solvents in developing countries.

222. The lack of certification of the equipment had so far not affected the plant's current operations as they have been shut down for several years pending the installation by 2010 of new oxygen-generating equipment. The shutdown has prevented the use of CFCs. PCC was unsure of whether or not they would be able to pay for the certification costs. It appeared, however, that UNDP/UNOPS did not undertake a sufficiently detailed prefeasibility study during project formulation to determine the scope of the sub-project. When the project was discussed with the UNDP Country Office during the course of this evaluation, they commented that they did not

---

[32] Bozheyeva, G. 2000. The Pavlodar Chemical Weapons Plant in Kazakhstan: History and legacy.
[33] MLF. 2001. Final Report on the Evaluation of Solvent Projects. UNEP/OzL.Pro/ExCom/35/12. Table 10 on page 18.
[34] MLF. 2001. Final Report on the Evaluation of Solvent Projects. UNEP/OzL.Pro/ExCom/35/12. Table 10 on page 18.

have the economic and financial expertise to contribute to such a study at the time of project design. Consequently, the responsibility for the costs of certifying the solvent equipment was never made clear to PCC. PCC expected the sub-project to pay, since the costs of certification were estimated by the company to be twice the value of the equipment and therefore a financially significant component of installing and operationalising the equipment.

7.5.5 Pre- and post-harvest technology that replaced methyl bromide in the regional project *"Total sector methyl bromide phase out in countries with economies in transition"*

223. Methyl bromide users in five countries received funding from the GEF/UNDP to implement MB-free procedures and technology for all uses except those used for quarantine and pre-shipment: Bulgaria (elimination of pre-harvest and post-harvest uses of methyl bromide), Hungary (pre-harvest), Latvia (post-harvest), Lithuania (post-harvest) and Poland (pre-harvest and post-harvest). There were many companies involved in the phase out. The details of these companies and their phase out of methyl bromide are provided in Section 8: Project Performance, impact, evaluation and ratings. The key features of the phase out of methyl bromide are summarised in Table 7.

224. The objectives of the project were to phase out the non-QPS uses of methyl bromide by 1 January 2005, in accordance with the Copenhagen Amendment to the Montreal Protocol. All of the countries achieved their phase out reduction targets that were stated in the Project Documents, resulting in overall 63.97 ODP-tonnes of ODS being phased out from 2004 to 2008. The total funding of UNDP by the GEF for the implementation of the investment activities that led to MB-free production in these five countries was $2.46 million.

225. From 1 January 2005, Bulgaria, Hungary and Lithuania did not apply for critical uses of methyl bromide and therefore their consumption was assumed to be zero from this date onwards. However, both Latvia and Poland requested approval from the Parties to the Montreal Protocol to use critical uses of methyl bromide, as they had yet to implement alternatives for all methyl bromide uses. Latvia and Poland were approved critical use exemptions by the Parties. However, Latvia was not authorised by the European Commission to use methyl bromide in flour mills as a technically and economically feasible alternative (phosphine) was available for use in flour mills in Latvia. The period from 1 January 2005 therefore shows Poland as the only consumer of methyl bromide in this regional project from this time onwards.

226. Based on the phase out of 63.97 ODP-tonnes of ozone-depleting substances and a UNDP budget of $2.46 million, the cost-effectiveness was calculated $38.45 ODP-kg per year. The cost-effectiveness of the implementation of MB-free procedures and technology in this Regional Project was compared with the cost-effectiveness of 23 methyl bromide reduction and phase out projects carried out in 31 developing countries. The average planned cost-effectiveness of these MLF-funded projects was $23.55 ODP-kg per year[35]. The overall cost-effectiveness of $38.45 ODP-kg per year in the *Regional Project* was about 63% more expensive than similar projects that had been carried out in developing countries.

227. Of the 23 projects cited above, only two of them were in the postharvest sector and the majority were in the pre-harvest sector. On the assumption that the MLF cost-effectiveness of $23.55 ODP-kg per year was applicable mainly to the pre-harvest sector, the cost-effectiveness of the phase out of methyl bromide in the pre-harvest sector in the Regional Project was very similar at $24.86 ODP-kg per year to the MLF estimate of cost-effectiveness. The cost-effectiveness of phasing out methyl bromide in the post-harvest sector in the Regional Project was $98.85 ODP-kg per year. The four-fold increase in post-harvest cost-effectiveness reflected the procurement of more expensive equipment that was required to eliminate methyl bromide in this sector, compared with the cost of equipment that was procured in the pre-harvest sector.

228. As a measure the longer term value of the initial GEF/UNDP funding, the evaluation determined whether or not the equipment that was funded in the project to eliminate the use of methyl bromide was still being used. This was the case for all of the projects in each of the five

[35] MLF. 2004. Desk study on methyl bromide projects. UNEP/OzL.Pro/ExCom/43/08. Final Annex listing the projects shows a cost-effectiveness of $16.11, but the corrected cost-effectiveness is $23.55 ODP-kg. Only about half the projects contained a cost-effectiveness figure as they were not finished at the time of the MLF evaluation, and only these could be used for comparison with the data in this report.

countries, mainly because the projects finished within the last two years before the evaluation and the test of sustainability is not as stringent after such a short period of time. However, it is likely that the outcome of the projects will be sustainable because of the restrictions that have been placed on the use of methyl bromide in the EU.

229. National and EU legislation that existed at the time of the project severely restricted the use of methyl bromide and required significant resources from NOUs at the time to report activities that used methyl bromide. The EU legislation has that was in force at the time of the project has since been superseded by revised legislation that has eliminated the use of methyl bromide altogether. Regulation (EC) 2037/2000 that was in force until 31 December 2009, required Member States:

- To phase out the placing on the market of non-QPS uses of methyl bromide by 31 December 2004;
- To put in place all precautionary measures practicable to prevent and minimise leakages of methyl bromide from fumigation installations and operations in which methyl bromide is used;
- To define the minimum qualification requirements for the personnel involved in methyl bromide fumigation;
- To require producers, importers and exporters of methyl bromide to report to the European Commission on the quantities of ODS produced, imported and exported annually; and
- To submit annual reports on the use of methyl bromide and its alternatives, and the quantity of methyl bromide recovered, reclaimed, recycled and destroyed.

230. All of the countries in the project implemented national legislation that harmonised as much as possible their national legislation on ODS with Regulation (EC) No 2037/2000 prior to Poland joining the EU on 1 May 2004[36], or 1 January 2007 for Bulgaria. National regulations that limited the availability of ozone-depleting substances including methyl bromide had a secondary beneficial effect of encouraging the development of ODS-free alternatives that could control pests without the restrictions of methyl bromide. All uses except QPS uses of methyl bromide in the EU ended on 31 December 2008.

231. Regulation (EC) No 1005/2009 replaced Regulation (EC) 2037/2000 from 1 January 2010. Methyl bromide did not meet the safety criteria and was de-registered in the Biocides Directive[37] (non-plant pesticide) from 1 September 2006, and in the Pesticides Directive[38] (Plant Protection Product, PPPD) from 18 March 2009. Since only QPS uses remained, Regulation (EC) No 1005/2009 focused on QPS. It permitted MB-QPS stocks[39] to be used until 18 March 2010, and limited the quantity of methyl bromide that could be use for QPS to 45 ODP-tonnes from 1 January to 18 March 2010, and none from this date onwards. Methyl bromide may be used for Emergency Uses[40] for controlling unexpected pest outbreaks, but only if it is first authorised by the European Commission and providing methyl bromide is permitted under the Biocides and Pesticides Directives. Currently, methyl bromide is not permitted in these Directives and *ipso facto* it cannot be used for QPS. Therefore, all uses of methyl bromide including those for QPS are banned in the EU from 19 March 2010. A total ban of methyl bromide will prevent QPS uses being used off-target for non-QPS uses and help to reinforce the total ban on the use of methyl bromide in Europe.

232. Methyl bromide projects are complex and unique in the sense that their success depends on the involvement of many stakeholders, including the fumigation companies. In the EU, fumigations with methyl bromide required specialised companies that were licensed to perform fumigations, and in contrast to many other countries, it could not be used by individual farmers. In the EU, there were less than 120 fumigation companies, compared to many hundreds of thousands of farmers. The relatively few companies authorised to fumigate with methyl bromide provided a

---

[36] LAND 50-2004: Ozone-Depleting Substances Management Requirements. In force from 1 May 2004. It implemented Regulation (EC) No 2037/2000 from the date that Lithuania joined the EC.

[37] Regulation (EC) 2032/2003

[38] Decision 2008/753/EC

[39] Articles 12 (1) (2) in Regulation (EC) No 1005/2009 on ODS

[40] Articles 12 (3) in Regulation (EC) No 1005/2009 on ODS

valuable focal point for targeting the phase out. Because methyl bromide was not used by farmers, they were often not concerned when an alternative fumigant had been substituted, providing the pests were controlled as a result of the new treatment.

233. Compared to the industrial sector, the sustainability of chemical alternatives is less assured because many of them are subject to further scrutiny and potential restrictions or bans under new legislation. Some countries reported that new formulations of existing fumigants were difficult to register, because companies that owned the fumigant did not regard the extent of the proposed use as commercially worthwhile to finance the costs of trials and registrations. The cost of registration can be an administrative burden to many companies.

234. Research and extension services provided an essential role in raising the awareness of the need to adopt alternatives, and in working with farmers to implement integrated pest management (IPM) procedures. IPM allows the strategic use of pesticides as a last resort and attempts to integrate as many non-chemical procedures as possible in a holistic way to control pests and disease. IPM is knowledge-intensive as farmers must understand the biology of pests and diseases, including their variation in abundance according to the climate, soil, biotic and other factors. Extension services in this Regional Project provided training and awareness programmes, they collaborated with research providers in demonstration projects and they took responsibility for dissemination of the information.

235. Farmers tended to be reluctant to change established practices if the superiority and safe application of new methods had not been clearly demonstrated for their particular situation. They were also exposed to lobbying efforts of some methyl bromide producers, importers or large scale users who question the reliability of scientific studies on the subject and oppose the reduction schedules of the Montreal Protocol. On the other hand, European supermarket chains in the EC had established a code of practice for agricultural production for fruit and vegetables, called EurepGAP. EurepGAP set voluntary standards for the certification of agricultural products globally. These standards were developed in response to consumer concerns about pesticide residues in food products and environmental pollution from agriculture. Increasingly, the European supermarket chains required farmers/suppliers to comply with strict food production standards that minimised the use of approved pesticides as a condition of supply. For soil treatments, the standards required suppliers/farmers to justify in writing the use of methyl bromide and other fumigants, and strongly promoted IPM and non-chemical methods of controlling pests and diseases.

236. Because of the challenges of getting the alternatives operational, all of these countries had in place effective legislation, licensing and quotas that restricted the imports and placing on the market of methyl bromide. This legislation had been implemented during the term of a previous GEF project which ran from 2000 until 2002 entitled "*Initiating early phase out of methyl bromide in CEITs through awareness raising, policy development and demonstration/training activities*". This was a Medium-Sized Project (MSP) that was designed to assist seven CEITs to reduce their use of methyl bromide[41]. The Project commenced in March 2000 and concluded in September 2002. Although it did not entirely eliminate the use of methyl bromide, it was effective in setting up the infrastructure that was needed to phase out methyl bromide. The effectiveness of the Customs was also most important in these countries for intercepting illegal imports of methyl bromide.

237. Despite these challenges and difficulties, the phase out was achieved in these five countries. All of the countries except Poland used the funding to provide more support for existing alternatives, whereas Poland used the funding to increase the area being used by the alternative for pre-harvest uses, and to implement new postharvest technology to control pests on imported products. The use of metam sodium to control soil pests in the production of strawberry runners was one of the more successful projects. There was a four-fold increase in the area production as a result of the project, compared to when methyl bromide was used. The project also helped to conserve employment and to promote the long term financial viability of the key company that was involved in the production of the strawberry runners. In the post-harvest sector, phosphine and other methods were being applied successfully to control pests in

[41] GF/4040-00-10 for CEITs Bulgaria, Estonia, Hungary, Latvia, Lithuania, Poland and Slovakia

flour mills. However, large bags for disinfesting pests on seeds were not successful due to difficulties in making them sufficiently airtight.

238. Bulgaria implemented metam sodium as one of the methods to control nematodes in glasshouses using a drip irrigation system. In general, the soil fumigation companies were looking at the prospects of more work as the area for soil disinfestation expanded. However, the impact of the finance on the postharvest fumigation companies could not be assessed as these companies have not yet used most of the equipment that was delivered because it had not been transferred to them by UNDP.

239. Latvia only replaced methyl bromide for post-harvest uses. It ensured that mainly phosphine fumigation was used to control pests in all flour mills, whereas before the project this gas was used by several but not all of the fumigators in Latvia. In addition, since the quantity of heaters provided to Latvia and Lithuania were insufficient in each country to raise the temperature to a lethal level to control the pests, the flour millers combined them together for use in one mill at a time in order to raise the temperature to the threshold known to kill pests.

240. In Lithuania, there was one company that was the largest and only fumigation company that used methyl bromide to control pests in silos and grain elevators. Two other fumigation companies that operated in Lithuania already used phosphine, and so the funds were used to convert the one remaining company to use this gas. Phosphine from speedboxes was registered in Lithuania. This registration was unusual in the Regional Project because elsewhere in Europe the manufacturer had experienced difficulty in meeting the data requirements of the local pesticide registration authority for registration. Lithuania also uses heat to control pests in mills, as described above, in addition to IPM procedures such as the use of vacuum cleaners to remove contaminated flour and pests, and pheromones that attract and trap flying insects.

241. In Hungary, a fumigation company was active using the spading machines to apply alternatives that replaced methyl bromide. The machines opened up the opportunity for the company to also consider new business in the production of strawberry runners for a German company. Another company produced sweet peppers and tomatoes in glasshouses, mainly with the use of rock wool as a replacement for soil and many different types of predators to control air-borne pests. Both companies have driven the methyl bromide phase out in a way that is a model for other companies to emulate. They have adopted the alternative technology, modified it where necessary, and treated the soil for nematodes without the use of methyl bromide for several years after the Project was completed. The use of the spaders has declined with the expansion of artificial soil in which nematodes were no longer pests. Bio-control technology in glasshouses has been taken to a very successful level. The programme had a catalytic effect as it increased number of growers locally who were attracted by the cost of bio-control that was about the same as chemical control, but with far fewer risks due to pesticide contaminants in their glasshouses and products.

242. The programme to eliminate methyl bromide contributed to a general programme that aimed to produce food with minimal chemical input. There were many skilful employees of companies, governments and agencies that demonstrated the technical and economic feasibility of the alternatives that were involved in this *Regional Project*.

Blank page for double-sided printing

Table 7: UNDP projects that supplied technology that aimed to eliminate the use of ozone-depleting substances

Country	Status	A2 or A5	Project Start	Project end	Implementing Agency	Enterprise name	Sector	GEF ($, million)	Financial viability test	Achieved ODS target?	ODP phased out (ODP-tonnes)	Operational	Increased production after the Project	Spare parts available?	Improved profitability	Supply companies increased	Increase in employment
1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18
Armenia	Non-EU	A5	2004	2009	UNDP	Saga	Dom. Refrig	0.170	No	Yes	6	Yes	Yes	NR	Yes	Yes	Unkn
Azerbaijan	Non-EU	A2	1999	2002	UNDP	Sumgait compress.	Dom. Refrig	2.400	No	NR	0	No	No	NR	No	No	No
Azerbaijan	Non-EU	A2	1999	2002	UNDP	Chinar	Dom. Refrig	2.900	No	Yes	122.4	Yes	No	NR	No	No	No
Tajikistan	Non-EU	A2	2002	2006	UNDP	Pamir	Dom. Refrig	0.123	No	Yes	0.2	No	No	NR	No	No	No
Lithuania	EU	A2	1998	2005	UNDP	Snaige	Dom. Refrig	2.009	No	Yes	112	Yes	Yes	NR	Yes	Likely	No
Lithuania	EU	A2	1998	2005	UNDP	Oruva compress.	Dom. Refrig	1.729	No	NR	0	No	Unkn	NR	Unkn	Unkn	Unkn
Uzbekistan	Non-EU	A2	1998	2007	UNDP	Sino	Dom. Refrig	1.516	No	Yes	35	Yes	No	NR	No	No	No
Latvia	EU	A2	1997	2007	UNDP	Kvadro	Aerosols	Unkn	No	Yes	5	Yes	Yes	Yes	Yes	Yes	Unkn
Lithuania	EU	A2	1998	2005	UNDP	Vilnius	Aerosols	0.468	No	Yes	246	Yes	Yes	Yes	Yes	Likely	Unkn
Armenia	Non-EU	A5	2004	2009	UNDP	Yerevan	Aerosols	0.228	No	Yes	14.33	Partially	No	No	No	No	No
Latvia	EU	A2	1997	2007	UNDP	Ritols	Foam (spray)	0.106	No	Yes	13	Yes	Yes	No	No	No	No
Kazakhstan	Non-EU	A2	2000	2005	UNDP	Trademarket	Foam (rigid)	1.154	No	No	90	Yes	Unkn	Yes	Yes	Yes	Yes
Kazakhstan	Non-EU	A2	2000	2005	UNDP	Trademarket	Foam (flex)	0.285	No	Yes	45	No	Unkn	No	No	No	No
Kazakhstan	Non-EU	A2	2000	2005	UNDP	Pavlodar	Solvent	0.107	No	No	0	No	No	No	No	No	No
Bulgaria	EU	A2	2004	2008	UNDP	Many - see Report	MB (soil + PH)	0.550	No	Yes	2.3	Yes	Unkn	Yes	Unkn	Unkn	Unkn
Hungary	EU	A2	2005	2008	UNDP	Zephyr + Arpad	MB (soil)	0.188	No	NR	0.0	Yes	Yes	Yes	Unkn	Unkn	Unkn
Latvia	EU	A2	2006	2008	UNDP	Dobeles + Labibas	MB (PH)	0.255	No	Yes	2.5	Yes	Unkn	Yes	Unkn	Unkn	Unkn
Lithuania	EU	A2	2005	2008	UNDP	Grūdų pirkliai	MB (PH)	0.277	No	Yes	6.2	Yes	Unkn	Yes	Unkn	Unkn	Unkn
Poland	EU	A2	2005	2008	UNDP	Many - see Report	MB (soil + PH)	1.188	No	Yes	53.0	Yes	Yes	Yes	Unkn	Unkn	Unkn

Blank page for double-sided printing

8 Project Performance, Impact Evaluations and Ratings

Blank page for double-sided printing

1 Armenia

8.1.1 Background

243. Armenia declared independence from the former Soviet Union in 1991. After a difficult period from 1991 to 1993, during which time Armenia fought a war with Azerbaijan and began the transition to a market based economy, the Armenian economy grew at an average rate of 5.4[42] percent from 1994 to 2000 and at 12 percent from 2001 to 2007. Although Armenia's macroeconomic performance has been strong 49.1 percent of the population still lives below the poverty line.

244. Armenia became a Party to the Vienna Convention and the Montreal Protocol in October 1999. As a developed country that was formerly a part of the Soviet Union, Armenia was required to, *inter alia*, phase out the consumption of halon on 1 January 1994; and to phase out CFCs by 1 January 1996. In 2001 the XIII Meeting of Parties noted that Armenia was in non-compliance with data reporting requirement under Article 7. The Meeting of Parties recommended the Government of Armenia to ratify the London Amendment to qualify for assistance from international funding agency[43]. In 2002, the Parties to the Montreal Protocol noted that that Armenia has reported data on consumption of substances in Annex A to the Montreal Protocol in 2000 above control levels as provided in Article 2 of the Protocol, and therefore that Armenia was in non-compliance with the control measures under Article 2 of the Montreal Protocol in 2000[44].

245. The Government of Armenia initiated the process of ratification of the London Amendment in 2002 and requested assistance from GEF as a country with economy in transition.

246. The Country Programme (CP) was prepared by the Ministry of Nature Protection, UNEP and UNDP with financial assistance from the GEF. The CP evaluated the consumption of ODS, outlined the policy and an Action Plan to eliminate consumption of ODS and identified priority ODS phase-out projects. According to the CP, the total 2000 ODS consumption was 175 ODP tonnes subdivided between refrigeration sector (160 ODP tonnes) and aerosols (15 ODP tonnes). The Action Plan outlined the commitments of the Government as follows:

- To phase out the ODS consumption by January 2009;
- To support the industry conversion to non-ODS technology;
- To develop and establish appropriate legal and regulatory framework to ensure effective ODS phase-out process and mitigate the risk of illegal trade;
- To develop and establish the necessary monitoring and licensing systems to control the imports and exports of ODS.
- The ODS Phase-out Project was approved by Council in October 2002. However, the project did not get CEO endorsement until November 2004, because Armenia ratified London amendment only in November 2003. Armenia also changed its status from Article 2 to Article 5 in 2002[45]. This caused policy conflicts since Article 5 countries are to be funded by the Multilateral Fund to the Montreal Protocol, while GEF funded Article 2 countries. Finally, however, a decision was reached to permit Armenia to proceed with GEF funding of its ODS phase out programme.

[42] World Bank country profile
[43] Decision XIII/18: Compliance with the Montreal Protocol by Armenia
[44] Decision XIV/31: Compliance with the Montreal Protocol by Armenia
[45] Decision XIV/2. 2002. Application by Armenia for developing country status under the Montreal Protocol.

247. The project was designed to assist Armenia in meeting its phase-out obligations under the Montreal Protocol within a realistic time frame and ensure availability of technical assistance to expedite the implementation of the CP. The project targeted priority ODS phase-out activities in the refrigeration and aerosol sectors and proposes technical assistance at the institutional and enterprise levels to facilitate implementation of the country programme.

248. The project is formulated as a framework project consisting of a technology conversion component implemented by UNDP and a technical assistance and training component implemented by UNEP. Under the technology conversion component in the refrigeration sector : funding of $595,410 was allocated to the *Recovery and Recycling of Refrigerants and* $54,000 *for Monitoring activities* as part of a national Refrigerant Management Plan; funding of $482,369 for *Awareness and Incentive Program for End-users of Refrigeration Equipment;* funding of $170,716 for the conversion of *SAGA Commercial Refrigerator Manufacturing Facility.* The total ODS phase-out target in the refrigeration sector was about 39 ODP tonnes. In the aerosol sector, funding of $228,096 was allocated for conversion of Yerevan Household Chemistry Plant to phase out 14.33 ODP tonnes with co-financing from the enterprise of $35,200.

249. Under technical assistant and training component funding of $144,612 was provided for *Training the Trainers in Refrigeration* to train trainers in servicing, maintenance and repair in the refrigeration sector. Funding of $252,569 co-finance of $ 42,000 from the Government were *Institutional Strengthening* which was designed to provide assistance for co-ordinating the implementation of the Country Programme, including training of customs officers for monitoring and control of ODS. The three components have been combined in one sub-project with the total allocation of $397,181. The summary of GEF funding and associated targeted ODP phase out is shown in Table 8.

Table 8: Sub-projects that contributed to the phase-out of ozone-depleting substances in Armenia that are ongoing (O) or completed (C)

Project index	Programme	Agency	ODS phase-out (ODP-tonnes)	GEF budget* ($)	Co-finance ($)	Status
GF/4040-05-02	Institutional Strengthening and Capacity Building – Establishment of an Ozone Office and Training for Customs Officers and Refrigeration Technicians	UNEP	3.0		42,000	O
ARM/**/***	National programme for recovery and recycling of ODS refrigerants, including Monitoring of RMP Activities	UNDP/ UNOPS	27.4	649,410		O
ARM/**/***	Raising awareness, incentive retrofit and replacement programme in the end-user refrigeration sector	UNDP	5.0	482,369		O
ARM/**/***	Phase-out of CFCs in manufacture of commercial refrigeration	UNDP/ UNOPS	6.5	170,716		C

Project index	Programme	Agency	ODS phase-out (ODP-tonnes)	GEF budget* ($)	Co-finance ($)	Status
	equipment at Saga					
ARM/**/***	Phase out of CFCs in production of aerosols at Household Chemistry Plant in Yerevan	UNDP/ UNOPS	14.33	228,096	35,200	C
	Total		**56.23**	**1,927,772**	**77,200**	

* Including agency support cost

250. It should be noted that only two out of five sub-projects have been physically completed at the time of the evaluation. UNDP have not issued Project Implementation Reports for their two completed sub-projects yet. The field visit of the evaluator to the country was conducted in January 2009. The evaluation of the GEF ODS phase out project in Armenia has to be considered as a mid-term evaluation. The evaluator obtained comprehensive information from field visits to project sites and interviews with Government officials, NOU and local UNDP officers, enterprise management and individual entrepreneurs involved. Information available in project documents and the NOU website was also used in this evaluation.

251. The design of the UNEP and UNDP sub-projects did not require clearly defined logframes and prior agreed performance indicators (PIs) at the time of their formulation and approval. The Project Brief prepared for the GEF Secretariat contains one page log frame matrix that shows objectively verifiable indicators, means of verification and critical assumptions and risks. These evaluation parameters, however, are not detailed enough and pertinent to the project as a whole or to individual sub-projects. Therefore, it has been necessary to retrospectively formulate some of project outputs and outcomes, and PIs based on objectives of individual sub-projects and outputs and implemented activities.

8.1.2 *GF/4040-05-02 - Institutional Strengthening and Capacity Building – Establishment of an Ozone Office and Training for Customs Officers and Refrigeration Technicians*

8.1.2.1 Objectives/Goals

252. The main objective of this sub-project is to strengthen the national institutional structure that would facilitate the efficient and effective coordination and management of the implementation of actions outlined in the Country Program and the Refrigerant Management Plan (RMP). More specifically, the project seeks to: 1) to provide resources for the establishment of a National Ozone Unit within the Ministry of Environment Protection; 2) to facilitate the adoption of a legal and regulatory system that ensure the compliance with MP obligations; 3) to raise the general public awareness about the Montreal Protocol and ODS phase; 4) to coordinate implementation of ODS phase out activities envisaged in UNDP/UNOPS sub-projects adopting ODS-free substitute technologies; 6) to enable the collection of the required data on ODS use and consumption and reporting to the Ozone Secretariat and IAs. The sub-project comprises two training components: a) training of customs officers for monitoring and control of ODS, and b) training of refrigeration servicing technicians. In the final analysis, the ultimate goal of the country ODS phase out programme and this sub-project was to eliminate the use of CFCs and to meet the requirements of the Montreal Protocol.

8.1.2.2 Effectiveness: Performance indicators

253. The objectives and outputs for the evaluation of the technical assistance sub-project were inferred from the detailed overall project description, UNEP PIRs and other available information and assessed as commensurate to real outcomes with relevant performance indicators are shown in Table 9.

Table 9: Objectives/ Intended Results - Outputs/Activities/Deliverables - Outcomes/Performance indicators

Objectives/Intended Results	Outputs/Activities/Deliverables	Outcomes/Performance indicators
1. Strengthening of the national capacity to effectively coordinate and administer the actions outlined in CP and RMP	1. Establishing NOU and initiating actions that created a suitable climate in the country for the expeditious phase-out Time required to UNEP to disburse the first funding tranche; Timely recruitment of sufficient and qualified NOU staff; Timely establishment of adequate NOU infrastructure; Provision of the counterpart funding;	1. Evidence of strengthened institutional capacity and improved coordination among stakeholders. Continuity of NOU staff and operation; Establishment of the Interagency Committee; Approval of the Action Plan; Access of NOU staff to decision makers; 2. Adequate political priority assigned by the Government to environmental issues and the MP in particular Position of the NOU Head in the Governmental hierarchy;
2. The facilitation of ODS phase-out by adoption of a legal regulatory system	3 Development and promotion of legislative acts and regulations on control of ODS ;	2. Introduction of legal acts regulating imports and use of ODS, and their enforcement. Ratification of MP Amendments; Adoption of legislation on ODS import/export licensing system in 2002 ; Establishment of ODS import quota system; Register of authorized importers; Introduction of ban on trade of ODS and equipment containing ODS; Adoption of qualification requirements in refrigeration servicing; Adoption of legislation that mandates 3R

Objectives/Intended Results	Outputs/Activities/Deliverables	Outcomes/Performance indicators
		activities; Introduction of appropriate tax incentives to facilitate use of alternative substances; Changes of market price relations between CFCs and substitutes;
3. Availability of trained custom officers to ensure the control of ODS movement across country borders	4. Establishing training centres; 5. Development and translation of a training manual; 6. Conducting a training workshop for trainers with participation of higher level officials from customs and other government departments (Phase 1); 7. Conducting the training programme on application of the licensing system and ODS identifiers for customs officers at border checking points(Phase 2); 8. Procurement and distribution of ODS identifiers;	3. Enforcement of ODS import licensing and quota system through training of customs officers. 4. Reduction in illegal trade of ODS. 5. Improvement in ODS data collection resulting from the raised awareness about ODS import licensing and quota system among higher level officials from customs and other government departments; Number of customs training courses conducted and officers trained; Continuity (follow-up, refreshment) of training activities; Availability of curricula and material used in customs training; Adequate number of ODS identifiers supplied; Effective use of identifiers; Availability of computerized customs data system; Evidences of enforcement of legislation through training of customs

Objectives/Intended Results	Outputs/Activities/Deliverables	Outcomes/Performance indicators
		officers;
4. Reduction of ODS emissions through the training of adequate number of technicians in good refrigeration servicing practices.	9. Procurement and delivery of training equipment; 10. Establishing a training center; 11. Development and translation of training curricula and manuals; 12. Conducting Train-the-Trainer Workshops (Phase 1); 13. Certification of trainers ; 7. Compilation of lists of participants and training schedule. 8. Dissemination of training material among servicing companies and individual technicians around the country. 9. Conducting training workshops for servicing technicians (Phase 2); 10. Organizing testing and certification of trainees; 11. Procurement and distribution of servicing tools;	6. Availability of adequate number of local trainers. Time required by UNEP to disburse GEF funding; Timely establishment and availability of equipped training center; Availability of training materials in the training process; Number of certified trainers ; 7. Introduction of good servicing practices into routine operation of servicing network and reduction ODS emissions. Number of trained and certified technicians (1100); Evidence of availability of modern servicing tools and equipment; Evidence of application of received knowledge and servicing tools in practical work;
5. The continuation of training activities upon completion of the project.	12. Introduction of ODS related curricula into training programmes of technical universities and vocational schools.	8. Growing availability of graduates from technical universities and vocational schools trained to handle ODS

Objectives/Intended Results	Outputs/Activities/Deliverables	Outcomes/Performance indicators
	13. Continuation of hands-on training in refrigeration servicing industry. 14. Development and promotion of a regulatory framework for the refrigeration sector which will enforce good maintenance and servicing practices.	issues. Number of graduates trained annually; Number of technicians receiving hands-on training and certified annually. Introduction of regulations on qualifications requirements for refrigeration servicing personnel. 9. Contribution to meeting the ODS phase-out targets. Reduction in ODS emissions due to introduction of good servicing practices in ODP tonnes.
6. The facilitation of support and coordination of local industry and technical institutions in adopting ODS-free substitute technologies and monitoring of the CP and RMP	15. Effective interaction with governmental institutions and agencies; 16. Increased cooperation with business sector and professional associations; 17. Assistance in coordination and monitoring of implementation of two UNEP training components and UNDP investment sub-projects (recovery and recycling; incentives programme; conversion of SAGA; conversion of Yerevan Aerosols). 18. Coordination in provision of modern tools and equipment to servicing workshops in domestic, commercial refrigeration and A/C sector; 19. Assistance in the preparation of budgets and advice on the	10. Improved coordination and monitoring in implementation of the CP and RMP. Evidences of access of NOU to and interaction with decision makers, steering committees or inter-ministerial bodies; Involvement of private sector stakeholders; Establishment and support of the Refrigeration Association; Successful completion of training of custom officers together with UNEP; Successful completion of training in good refrigeration servicing practices together with UNEP; Number of R&R and servicing kits provided to refrigeration servicing enterprises; Successful completion

Objectives/Intended Results	Outputs/Activities/Deliverables	Outcomes/Performance indicators
	release of funds from the GEF;	of incentive programme in replacement of the refrigeration equipment; Successful conversion of "SAGA" commercial refrigeration manufacturing plant to non-ODS technology; Successful conversion of Yerevan Aerosols.
7. Raising awareness of the general public, local industry, technical institutions and the Customs on the ODS phase out, the existence of ODS-free technologies and the need to control consumption and movement of ODS in the country.	20. Conducting awareness workshops for central and regional governmental officials, environmental inspectors and customs officers on ozone layer and MP issues; 21. TV and radio interviews on ozone layer protection issues; 22. Dissemination of booklets about ozone layer protection, and implementation of National ODS Phase out Programme;	11. Improved communication with and effective engagement of governmental and non-governmental institutions, professional organizations, private sector and general public in ODS phase out activities. Number of workshops and degree of participation of institutions listed in Item 4. above in awareness programme and related ODS phase out activities; Number of publications prepared and disseminated; Degree of market penetration of ODS free products; 12. Reduction of ODS consumption due to public awareness programme.
8. Facilitate / enable the collection of the required data on ODS use and consumption, establish the line of information exchange in the country and reporting to the Ozone Secretariat and IAs.	23. Collection, analysis and exchange of MP related information in the country and the region; 24. Preparation annual reports on ODS consumption and NOU activities to the Ozone Secretariat (OS);	13. Establishment of the line of communication with the Customs, and licensed importers to collect ODS import data. Creation of ODS database; Timely availability of Article 7 data in the

Objectives/Intended Results	Outputs/Activities/Deliverables	Outcomes/Performance indicators
	25. Preparation and submission of necessary information and reports to the implementing agencies; 26. Exchange of experience between the NOU and other Network members to combat illegal trade in ODS, including sub-regional cooperation; 20. The implementation of regionally unified procedures for tariff classification and monitoring, control and reporting of data on trading of ODS using knowledge obtained from participation in the regional training workshop for CEIT Custom Officials.	Ozone Secretariat. 14. Establishment of the line of communication with the Ozone Secretariat and NOUs in border countries, . Communication of MP related information to UNEP Ozone Secretariat (OS); Reporting to the Implementation Committee; Participation in Central Asia and Eastern Europe Networking; Improvement of the quality of NOU reporting to IAs;
9. Facilitate the Government of Armenia in reduction and phase out of consumption of controlled ODS.	21. Coordination of the implementation of the National ODS Phase- out Programme to meet compliance obligations.	15. Compliance with the MP ODS phase out schedule.

8.1.2.3 Attainment of objectives and planned results: Effectiveness

254. The assessment of achieved results and their effectiveness involve the analysis of how the intended results as formulated in the sub-project were achieved and inputs have been translated into outputs and long-term outcomes, and impact. Performance indicators formulated in the third column of Table 2 served as evaluation tools of the sub-project outcomes. The effectiveness, relevance and efficiency were used as qualifiers in measuring the success or failure as appropriate.

8.1.2.3.1 Establishment of the Ozone Office

255. The National Ozone Unit (NOU) was established within the Ministry of Nature Protection following the first disbursement of GEF resources by UNEP in March 2005. The head of Division of Land and Atmosphere Protection assumed responsibilities of the NOU leader continuing to be a part time employee of the MNP. This set up ensured the NOU an adequate and well defined place in the national administration and access to decision makers. The NOU established working relationships with the State Committee for Customs Control and other ministries and national institutions concerned. The organogram depicting the institutional framework and positioning of the NOU within the Government structure is shown in Figure 6. The Institutional Strengthening component was initially approved for 2004 to 2007 duration and extended until March 2009 maintaining the same budget. The NOU funding included provision for computing and

communications equipment, operating costs including telecommunications and office supplies, staff support for a national project coordinator, funding to raise the awareness of the need for ozone layer protection, and project support services. Apart from the head of the NOU, there are two full time officers in the staff.

256. The NOU has the working plan that is supervised by the Deputy Minister of the MNR to whom the head of the NOU is communicating regularly.

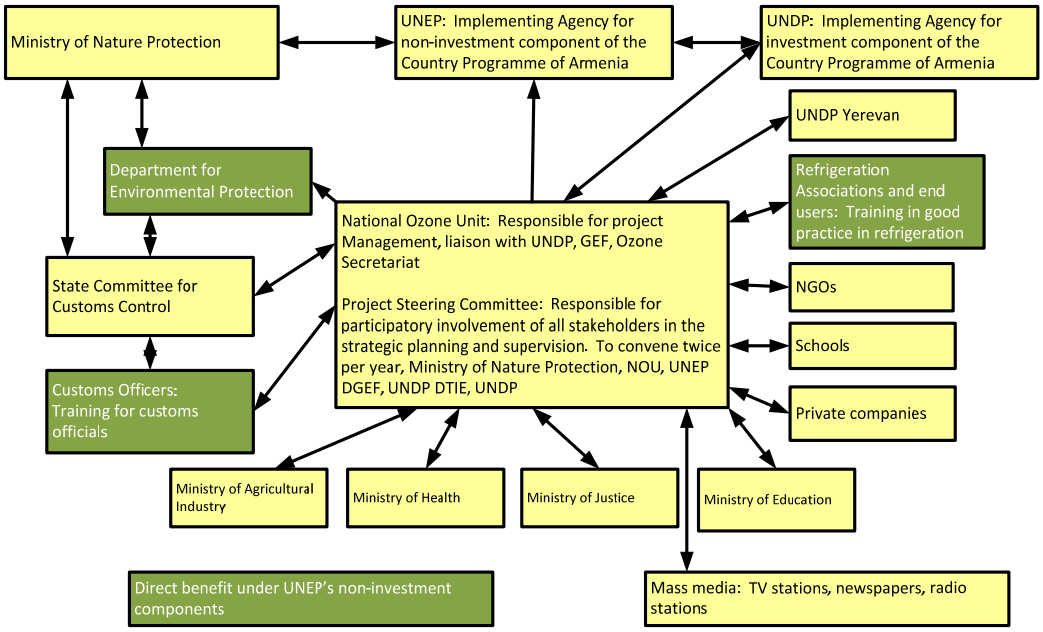


Figure 6: The NOU in relation to other Government departments in Armenia

8.1.2.3.2 Adoption of legislative acts and regulations on control of ODS

257. The drafting and adoption of legislation measures on ODS licensing and quota system was scheduled in January –December 2005. Due to UNEP administrative reasons, there was a couple of month delay in the start up of the project. The drafting of the legislation started immediately after the first disbursement was channelled through the UNDP Country Office in March 2005. The draft of the Law on Substances that Deplete the Ozone Layer was prepared by the end of December 2005. However, the adoption process was proceeding through several steps. The Law passed through the Parliament and was officially adopted on 27 November 2006. The Law banned the production of ODS in Armenia and the trade with non-Parties of Vienna Convention and Montreal Protocol. Thereafter, the sub-legislative acts have been prepared and submitted for approval. In 2007, the following five Governmental regulations were adopted by the Cabinet on specific aspects of licensing of ODS imports and exports and establishing the quota system:

- The Ministry of Environment Protection was designated as a principal body to deal with ODS policy and specific regulations, including imports and export, accounting, distribution of quotas, and issuing permits[46]
- The list of ODS controlled substances and the total import quota was established.[47]
- The procedure on establishing of ODS import quotas was adopted[48]. The import quota has to be established for each individual importer and serve as a basis for issuing import permits that stay valid for one year. The importer has to inform MEP on actual imported ODS quantities by 25 February next year.
- The format and procedure of issuing permits for ODS imports, exports and re-exports

[46] The Cabinet Decree No 291-N of 15 March 2007.
[47] The Cabinet Decree No 327-N o 15 March 2007.
[48] The Cabinet Decree No 521-N of 17 May 2007.

were approved[49].

- The procedure of keeping record of ODS consumption and movement within the country was adopted[50].
- Montreal and Beijing Amendments to the Montreal Protocol were ratified by the Government on 12 December 2008.

258. Since 2003, Armenia has been participating in UNEP Networking Activities for Eastern Europe and Central Asia region financed through the Multilateral Fund. There were six networking meetings organized for ozone officers from the region and two refrigeration contact group meetings. The NOU expressed its appreciation of having been invited to these meetings that greatly facilitated in obtaining knowledge and expertise on administrative and technical aspects of the Montreal Protocol. The NOU established a website which has been well maintained and regularly updated.

259. The NOU was not successful in adoption of ODS excise taxes to facilitate the use of alternative substances and on imports of ODS containing equipment as planned in the Country Programme. The introduction of qualification requirements in refrigeration servicing and adoption of legislation that mandates refrigerant recovery and recycling activities is also in the future agenda of the Government. In spite of these shortcomings, it appears that the NOU has an adequate and well defined place in the Government structure and access to decision makers that ensures the fulfilment of its role as defined in the Country Program and in the IS sub-project. The MNP with the support from the NOU managed to create a solid legislative base that enabled the control of trade of ODS and created environment for successful implementation of investment ODS phase-out initiatives.

8.1.2.3.3 Enforcement of regulations on the ODS control through training of customs officers enforcement

260. The sub-legislative laws were adopted by June 2007. This delay had implications for the start up of Phase I customs training, and it was for this reason that Revision 1 of the project was carried out, altering the training completion date to December 2008.

261. The responsibilities of the State Customs Committee (SCC) and procedure on ODS control had been determined after the respective legislation was approved. The Training Manual for Customs Officers, leaflets "*Checking of Documentation*", "*Inspection of Goods*", "*Smuggling Methods*" and Customs Officer's Quick Tool for Screening ODS were adapted into Armenian, published and distributed to Customs Officers. The National Train-the-Trainers Workshop for Customs Officers (Phase 1) was held in Yerevan, 22-24 May, 2007 resulting in training of 13 customs officers who conducted Phase II training as instructors. The certificates were provided after the verification test at the end of the course.

262. Phase II training was conducted in 2007 and 2008 for 75 officers representing 7 entry points on operational issues of enforcing the ODS Licensing system by Customs officers. The training curriculum covered issues on ozone layer depletion and the Montreal Protocol provisions, national regulations concerning ODS and requirements for documentation, methods of identification of ODS, illegal trade in ODS and reporting requirements. A practical session on identification of ODS using refrigerant identifiers was also part of the agenda. At the end of the workshop, each participant that passed test received a certificate. In total, 12 ODS identifiers were distributed among 7 regional entry points and 5 customs centres. One workshop was conducted for importers of ODS emphasizing enacted ODS import regulations and requirements for documentation.

263. The evaluator met with the staff of the Supervision Department of the SCC who was very positive about the results of the training program. The customs officers focus primarily on the verification of documentation of the shipment that goes to the yellow corridor and take sample of about 10% of the bulk shipment for checking the refrigerant with ODS identifiers (red corridor). There were no cases of illegal trade since the existing import quota of CFCs of 29.5 ODP tonnes in 2007 – 2009 was sufficient in meeting the national needs. The ODS identifiers have been very useful in the detection of mislabelled HFC shipments. The data on imports of specific ODS and the country of origin has been collected using the internal computerized system and communicated to the

[49] The Cabinet Decree No-771 of 21 June 2007.
[50] The Cabinet Decree of 20 March 2007

MNP on the annual basis. The handling of data was not difficult since there are a limited number of certified importers.

264. The evaluator received acting formats for ODS importers: application for import quota; permit for import quota; application for ODS shipment permit and ODS shipment permit. These documents contain all the necessary details and enable to track quantities of imported ODS and ODS mixtures, and the country of origin.

265. There is no imminent threat of illegal trade of CFCs because Armenia can legally import up to 25 ODP tonnes in 2007 to 2009. In 2008, Armenia reported CFC imports of 13.6 ODP tonnes that is by 11.4 ODP tonnes lower than the allowable quantity. The threat of illegal trade might pronounce itself in 2010 and onwards since the CFC-based refrigeration equipment will continue to exist and demand for CFC-12 refrigerant will remain. The NOU and the Government of Armenia have to be vigilant in their assessment of the potential illegal trade and take the necessary measures on continuing training of the customs officers. It appears that the customs are well equipped to cope with the future challenge. The ODS Licensing System is in place and fully operational. The country has ratified the Montreal and Beijing Amendments of the Montreal Protocol.

266. The real challenges to the timely implementation of IS and training components were associated with the time required for the passage of the supportive legislation for controlling the movement and consumption of ODS in the country. Originally, the project implementation plan envisaged the drafting and adoption of the legislation within January-December 2005. The time necessary for such developments was grossly underestimated in the original project design; and, unfortunately, elements of training, particularly the Customs training components, were not permitted to begin without the passage of the legislation.

267. Once the Institutional Strengthening (IS) support from the GEF is over, Armenia as Article 5 country will be eligible for continuation of assistance for IS activities from the Multilateral Fund and will be able to implement measures reducing a potential for the illegal trade.

8.1.2.3.4 Training of refrigeration technicians

268. The aim of this component is to improve servicing and maintenance practices in order to prevent intentional and/or unintentional emissions of CFC refrigerant into the atmosphere and extend the lifetime of the equipment through better repair and maintenance. The target was the training of 750 servicing technicians. The training process was organized as Phase I train-the-trainers and Phase II training of the remaining targeted personnel. Two training centres were established: one in Yerevan and the other in Gyumri. The UNEP training manuals “Good Practices in Refrigeration” and “Natural Refrigerants as Alternatives to HCFC” were translated into Armenian, published and distributed to Refrigeration Technicians. The training programme covered the following areas: depletion of ozone layer, ODS control measures and provisions of the Montreal Protocol; appropriate servicing and maintenance practices, new drop-in refrigerants, leak detection; concepts of refrigerant recovery and recycling; proper handling of refrigerants; government regulations which will affect the refrigeration sector. Practical hand-on sessions were also included in the program

269. The train-the-trainer workshop was organized in Yerevan in October 2005 and 27 trainers had been trained. The Phase II continued in 2006 and 2007. Six training workshops were conducted resulting in training of 685 technicians that is very close to the established target.

270. The ODS phase-out target of the training program was determined to be 3.0 ODP tonnes. The introduction of good practices in the refrigerant management has definitely contributed to the ODS overall phase-out. However, it would be difficult to quantify this contribution

271. The implementation of the Training and Refrigerant Recovery and Recycling Program was assisted by the Refrigeration Association which is very active in Armenia. There are 55 active members of the Association that have been holding regular meetings. The Chairman is permanently in touch with the NOU and two national refrigeration consultants.

272. The training program was necessary to introduce the good servicing practice reducing emissions of ODS refrigerants during servicing operations. The training of 712 trainers and technicians almost meets the target established in the project. The training of refrigeration servicing technicians has also to be continued by emphasizing the availability of non-CFC servicing blends

and retrofits in order to limit the potential for the illegal trade. The importance of these options will be growing with short or zero supply of CFC refrigerant. The availability of training manuals in Armenian will facilitate further training both at the enterprise level and centrally using the Refrigeration Association facilities.

273. The biggest challenges to the IS and training components have been the time taken to develop the supportive legislation for controlling the movement and consumption of ODS in the country. The time necessary for such developments was grossly underestimated in the original project design; and, unfortunately, elements of training were not permitted to begin without the passage of legislation in the original project design.

274. The refrigeration department in the local Polytechnic Institute included ODS and Montreal Protocol related issues into its curricula ensuring the continuation of training activities upon completion of the project. Annually, 14-15 graduates receive a diploma of refrigeration engineers. NOU has already worked with training centres for institutionalisation of training.

8.1.2.3.5 The NOU role in co-ordination of ODS phase out activities

275. The implementation of investment projects by UNDP/UNOPS and non-investment activities by UNEP required the coordination by the NOU on three levels: a) among governmental institutions; b) among implementing agencies; and c) among national commercial enterprises. The serious challenge for the NOU was timely development and promotion of the supportive legislation for controlling the movement and consumption of ODS in the country that. These activities required active interaction with governmental institutions. The legislative package was prepared within eight months and passed to the Government for approval in December 2005. It took about a year for the Government to adopt the legislation.

276. The implementation of training and investment activities required intensive coordination efforts with UNEP and UNDP/UNOPS, and with enterprises and numerous individual entrepreneurs in the refrigeration sectors. Both UNEP training components for custom officers and refrigeration technicians required establishment of training centres and other logistics involving 775 trainees. The NOU was in close coordination with the State Customs Committee, Refrigeration Association, technical education facilities, refrigeration servicing companies and individual entrepreneurs.

277. The NOU provided support for the implementation of two investment conversion projects at commercial refrigeration manufacturer SAGA and Yerevan Aerosol Plant. The implementation of the financial incentive and retrofit programme involved 35 enterprises in food processing and commercial sector. The execution of the recovery and recycling programme required interaction with 42 beneficiary refrigeration servicing enterprises and about 100 individual entrepreneurs. The NOU staff and local consultants provided all the necessary support to the implementing agencies in identification of beneficiaries and delivery, customs clearing, storage and distribution of equipment.

278. All the sub-projects either have been completed or are in the advanced stage of completion that serves as an evidence of the successful coordination role of the NOU.

8.1.2.3.6 The public awareness programme

279. The NOU implemented a comprehensive ozone depletion awareness program targeting general public, Government institutions and industry. The first category of awareness material was prepared for education of children and school students, including leaflets about the ozone layer, the poster "*Saving the Ozone Layer!*" , the calendar, copy-books containing pictures, slogans and information on the ozone layer, the booklet "*Save the Ozone Layer!*" with children's pictures, the first three issues of the "*Ozzy Ozone*" comics (translated from the English original), *Ozzy Ozone Game* translated and reproduced in 3m x 3m format for making it playable on the ground, education pack for teachers "*Saving the Ozone Layer*" with related questionnaires for children (adapted from the English original), book "*Twenty Questions about the Ozone Layer*" (adapted from the English original).

280. The NOU organized about fifteen events such as awareness workshops related to the ozone layer and the Montreal Protocol in Yerevan and other locations, round tables associated with the celebrations of the International Ozone Day and related radio and TV broadcasts involving respective Government officials. Non-governmental environmental organizations have been

frequently involved in organization of awareness workshops. The evaluation team met with the Environmental NGO "Khazer" that has a mandate to raise the awareness about environmental issues in Armenia, including the ozone layer. The focus of "Khazer" activities is on schools students. Two students of 5th grade participated in international environmental children forum "TUNZA" held in Norway in June 200. The issues related to the depletion of the ozone layer and Montreal Protocol have been covered in agendas and curricula of specialized training workshops.

281. The awareness campaign promoted a favourable public response on ODS legislation under development at the time, and it likely to have a sustainable impact on future generations that understand the need for ODS recovery. The wide dissemination of information about ozone depleting issues contributed to expanded penetration of ODS-free equipment and its acceptance by the industry and general public. The NOU created an effective and efficient documentation centre that helped in dissemination of information on ozone matters, both on request and via public awareness programmes. On the whole, the expected outcomes of the public awareness component have been achieved. However, there were neither a baseline established, nor performance indicators developed, that could be used to monitor the impact of the awareness raising campaign on ODS phase-out activities in the country. Therefore, it was not possible to assess the impact of this component.

8.1.2.3.7 The role of the NOU in collection of ODS related data and information exchange with other parties

282. The ODS consumption data is a crucially important tool for the monitoring of the achievement of project main objective. The collection of ODS consumption data and reporting this data to national supervisory bodies and the Ozone Secretariat is the essential task included in the terms of responsibilities of the NOU. The data officially reported under Article 7 of the Montreal Protocol to the Ozone Secretariat and to the Implementation Committee, and serve as a basis for determination of the compliance of the country with the Montreal Protocol phase-out schedule. There are two meetings of the Implementation Committee a year for the presentation of its findings. The Committee acts as an independent monitor of ODS phase out projects and country performance.

283. The monthly reports from the State Customs Committee (SCC) are the major source of data on ODS imports, exports and transit. The SCC reports include data on quantities, time and country of imports, exports or transit. The representative of the SCC referred to the good businesslike relationship with the NOU. The ODS import data are the integral part of the internal SCC computerized database that greatly facilitates the timely communication of data to the NOU. The NOU verifies SCC data by comparing them with data provided by importers to the MNR. The NOU provided regularly ODS consumption data to UNEP DTIE and DGEF, and the Ozone Secretariat.

284. The NOU is responsible for submission of half-yearly progress reports as at 30 June and 31 December, a terminal Report within 60 days of the completion of the project detailing the activities taken under the project. The NOU should also submit to UNEP quarterly project expenditure accounts and final accounts for the project, showing amount budgeted for the year and amount expended since the beginning of the year. An initial cash advance should be made upon signature of the project document and subsequent advances are to be made quarterly. According to UNEP DGEF PIRs, all the reports were presented in a timely manner and were complete and accurate with a good analysis of project progress and implementation issues. The NOU was recognized as good at supporting the reporting with additional appendices to detail activities carried out (inclusive of photos and participant lists).

8.1.2.3.8 The role of the NOU in meeting compliance obligations

285. Armenia has to comply with the phase out schedule established for Article 5 countries. Armenia reported consumption of only Annex Group I controlled substances (CFCs). Country baseline (average 1995-1997 consumption) stood at 196.5 ODP tonnes. CFC consumption has been steadily decreasing since the approval of the project in 2004. The technical assistance components implemented by UNEP, including IS sub-project have not established ODS phase out targets but rather created the necessary prerequisites and environment. Such targets are part of the design of investment sub-projects implemented by UNDP/UNOPS. The role of the NOU remains crucial in coordination of all ODS phase out activities in the country. CFC consumption

was reduced from 110.7 ODP t CFCs in 2004, to 13.6 ODP t in 2008. The country was in compliance with 50% and 85% reduction targets in 2005 and 2007 respectively. There are positive signals that zero CFC consumption target will be also achieved in 2010. Figure 7 shows the targeted Montreal Protocol benchmarks and actual CFC consumption.

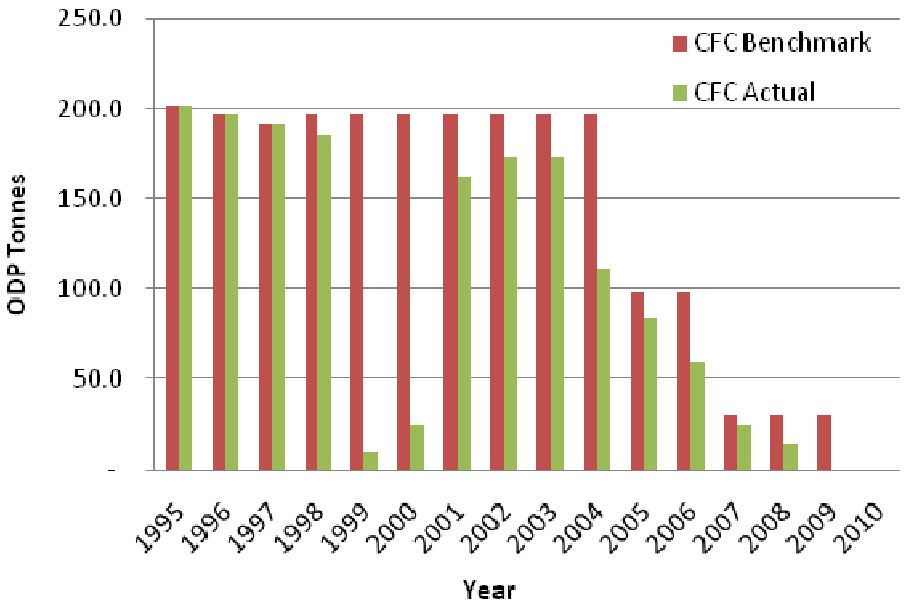


Figure 7: Montreal Protocol benchmarks and actual CFC consumption in Armenia

8.1.2.3.9 Future challenges

286. The main challenge is related to the failure of the GEF project to offer flexibility and acknowledge the need for adjustment in the light of inevitable expansion of MP requirements. The GEF project did not address consumption of Methyl Bromide in agricultural sector and halon used in the fire-fighting applications. The issues with these two control substances remain only partially resolved and put a pressure on the NOU and the Government.

8.1.3 Methyl Bromide

287. Armenia has not reported consumption of halons and methyl bromide in years preceding the formulation of the GEF project. No baseline and consumption reduction targets were established for Armenia by the Montreal Protocol. Therefore, halon and methyl bromide issues have not been covered by the GEF project. In 2004, Armenia imported 1,020 ODP tonnes of methyl bromide for post-harvest applications. The XVII Meeting of the Parties determined that these quantities exceeded the maximum allowable consumption level of zero ODP-tonnes for that controlled substance for that year, and that Armenia was therefore in non-compliance with the control measures for methyl bromide under the Protocol. The Parties recommended to Armenia to adopt a plan of actions for returning to compliance. The assistance was provided to Armenia outside the GEF project. The Executive Committee of the Multilateral Fund requested UNEP and UNIDO to grant the support through the Compliance Assistance Programme. The NOU was also proactive in addressing the issue of non-compliance. The plan of actions was formulated with assistance from the Fund Secretariat, Ozone Secretariat, UNIDO and UNEP. The plan of action aimed to sustain the zero methyl bromide consumption from 2007 onwards through the enforcement of legislation banning the imports of methyl bromide, and raising the awareness and training of importers, fumigators and farmers on the use of alternative pest management methods.

288. Additionally, the priority assistance package was provided to Armenia as part of activities of the Regional Ozone Network in Europe and Central Asia (ECA Network) by supporting the participation of national experts in workshops on methyl bromide alternatives held in Kyrgyzstan and Bulgaria. The NOU initiated the translation of training manual into Russian. The ECA network

also provided programmatic assistance in collection of methyl bromide consumption data, in formulating the national legislation and in convening the national workshop for major methyl bromide end-users on alternative pest management methods conducted in October 2007 with 16 participants. An article on methyl bromide alternative methods was published in the book of articles of the IV National Medical-Scientific Conference "Human Health".

8.1.4 Halons

289. The ECA Network was instrumental in providing assistance in relation to the environmentally responsible use of halons. Upon a request from the NOU, a technical assistance mission on status of halons management was carried out in Armenia in July 2007 in coordination with the Regional Network Coordinator of the ECA Network. The mission commenced with the one-day roundtable exploratory meeting to raise and discuss issues related to the status of halons and halon management in Armenia. Representative from the Armed Forces, the Fire Service, the Civil Aviation and Fire Systems Supplier were invited to the meeting. The National Ozone Unit and the Halon Officer delivered a number of presentations aiming to raise the awareness of the participants and laying the ground for discussions. It was the first time when issues related to halons were discussed and the participants expressed interest in the subject, raised many questions. Thus, the discussions appeared to be fruitful. The participants requested the NOU to hold more of such meetings and invite a wider audience that could benefit from the information provided. Subsequently, a site visit to a fire system supplier was carried out.

290. The technical assistance mission demonstrated that there was a clear lack of awareness concerning halon management and available alternatives among the main halon stakeholders and parties with critical uses/applications of halon such as the Armed Forces, the Fire Service and the Civil Aviation. The Armed Forces, the Fire Service and the Civil Aviation expressed their concern and need for further capacity building and technical awareness relating to halon management and suitable available alternatives. The last survey of installed capacity of halon was carried out in 2005. Since then, the data have not been updated. The bulk of quantities of installed halon have not been identified and updated to provide a clear picture of the installed capacity in the country. The Government and the NOU have to take urgent measures in formulating a national plan of action in the halon sector.

Metered Dose Inhalers

291. Armenia does not manufacture Meter Dose Inhalers (MDI) but imports the CFC-based MDIs. For the period 2000 to 2008, Armenia imported about 200,000 units of CFC-based MDIs. In 2008, the ECA Network Meeting recommended Article 5 countries to promote the transition to CFC-free MDIs by development of National Transition Strategies, including collection of national information on imports and applications of MDIs; licensing restrictions on imports of MDIs leading in time to prohibition of imports; registration of importers; and exploring the possibility for fiscal incentives to encourage CFC-free MDIs. As a first step, the MNP and NOU together with the Ministry of Health organized the meeting of all parties concerned in October 2008. The Scientific Centre of Drug and Medical Technologies Expertise took the initiative in collecting the information on imports and use of CFC-and non-CFC-based MDIs and developing a transition strategy containing three components: regulatory measures, awareness/educational campaign with stakeholders and accessibility to non-CFC MDIs. The draft of the legislation was promoted to the Government with the recommendation to allow imports of CFC-based MDIs only for limited applications approved by the Ministry of Health. UNEP is conducting a series of regional workshops on in support of national transition activities.

8.1.4.1.1 Relevance

292. The outputs and outcomes of the IS project were in agreement with the Government strategy and priorities outlined in the country programme.

293. Although the GEF is not linked formally to the Montreal Protocol, its strategy in the Ozone Layer Depletion Focal Area is an operational response to the Montreal Protocol. The strategic objective of the Focal Area is to protect human health and the environment by assisting countries in phasing out the consumption and production, and in preventing release of ODSs while enabling alternative technologies and practices according to countries' commitments under the Montreal

Protocol. The expected long-term impact of the GEF interventions is to contribute to the return of the ozone layer to pre-1980 ozone levels, which is expected by 2065. The IS project in Armenia fits the GEF strategy.

294. The link between ozone depleting chemicals and climate change has also increased dramatically in recent years with the recognition that many of ODS also have significant global warming potential (GWP)[51] many hundreds to thousands of times greater than carbon dioxide. The GEF portfolio of ODS phase out project in CEITs and in Armenia in particular, contributed to avoided GHG emissions. The project outcomes are, therefore, consistent with and contributed to the objectives of GEF Ozone Layer Depletion and Climate Change Focal Areas and respective operating strategies.

8.1.4.1.2 Efficiency

295. It is problematic to assess the cost-effectiveness of the IS project in terms of US$/kg ODP. However, from analysis of outcomes versus inputs, one can conclude that the project was cost-effective. The NOU activities facilitated reduction of CFC consumption from about 172.7 ODP tonnes in 2003 to 13.6 ODP tonnes in 2008.

296. The cost effectiveness of the training component can be assessed by the cost per one trainee in the training programmes for customs officers and refrigeration technicians. The costs associated with the two training programmes have been extracted from the IS sub-project budget by component activity annexed to the project document as follows: $69.969 for customs training and &144,612 for training of refrigeration technicians. The cost per trainee would be $795 and $203 respectively.

297. The GEF project was formulated for the duration of 3 years with the objective to assist the country in rapid phase-out of ODSs consistent with international efforts in the implementation of requirements of the Montreal Protocol. However, though approved by Council in October 2002, the project did not get CEO endorsement until November 2004, because Armenia delayed the ratification of the London Amendment until November 2003 and changed status from Article 2 to Article 5 around the time of approval. The project implementation schedule envisaged to complete all the planned activities within 36 months by October 2007. The delayed passage of legislation, has delayed the start of Customs training, and so the project has been extended to December 2008. The IS support was further extended in 2009 to finalize the remaining ongoing activities and ensure the achievement of zero ODP consumption by the 1 January 2010.

298. The extension of the implementation time beyond October 2007, however, did not make the project less cost-effective. Originally, UNEP grossly underestimated the time necessary for the accomplishment of planned activities and continuous support of the NOU. Even though, the planned activities were completed as planned in 2007 the support of the NOU would have to continue in order to guarantee the achievement of 2010 zero consumption target established for Armenia as Article 5 country.

8.1.4.2 Assessment of Sustainability of project outcomes

8.1.4.2.1 Financial resources

299. Originally, the sub-project was planned for three year duration (2005-2007). The approved budget of the technical assistance component amounts to $397,181 including specific allocations for the establishment of the NOU, drafting of legislative measures, delivery of the awareness programme, collection of ODS consumption data, and training of customs officers and refrigeration technicians. The Government offered its in-kind contribution of $32,000 to cover rental costs of premises occupied by the NOU and logistics support in delivery of the awareness and training components. Later, the funding was extended until 2010. The provided resources are fully adequate in relation to proclaimed objectives. Changes in the US$ rate of exchange against the Armenian currency have been problematic, at times requiring minor changes to the budget allocations.

300. Additionally, the assistance was provided to Armenia as Article 5 country outside the GEF project

[51] Global warming potential is a measure of how much a given mass of greenhouse gas is estimated to contribute to global warming. It is a relative scale which compares a gas in question to that of the same mass of CO2 (whose GWP is 1).

on issues related to control of methyl bromide, halons and MDI that have not been covered by GEF funding. The Executive Committee of the Multilateral Fund granted support through the Compliance Assistance Programme and encouraged participation of Armenian experts in related activities of the Regional Ozone Network in Europe and Central Asia (ECA Network).

301. As an Article 5 country, Armenia is entitled for institutional strengthening assistance from the Multilateral Fund upon completion of the GEF project. The XXI Meeting of the Parties took the principle decision on the extension of the institutional strengthening funding for Article 5 countries beyond 2010. The specific timeframe and other parameters of IS funding are under discussion of the MLF Executive Committee in the context of funding of HCFC phase out activities in Article 5 countries. There is a great likelihood of availability of additional financial resources and sustainability of achieved outcomes.

8.1.4.2.2 Socio-political and institutional framework and governance

302. The evaluator met with the Deputy Minister of Nature Protection who is fully aware about ozone layer issues and expressed his support to the GEF project which is seen by the Government as an example of the synergy in the context of combating the global warming. The level of Government commitment to the institutional support remains to be high. The head of the NOU occupies the position of the Land and Atmosphere Protection Division in MNP and has established good working relations with major stakeholders. Due to the successful awareness campaign involving NGOs there is a broad understanding of the importance and long-term objectives of ODS phase out activities among stakeholders involved. There is no evident socio-political risk to the outcomes of the project.

303. The approved legislation package, including the licensing and quota system is well established and reinforced through the active involvement of the customs. Recently, there were no noticeable attempts of illegal trade of ODS because allowable imports covered the demand in CFCs. The system will be challenged in 2010 and onward when legal imports are stopped. Additional efforts will be required to further enforce the sustainability of the Project and meet Government commitments, including adoption of qualification requirements in refrigeration servicing industry, taxation of ODS imports, introduction of the ban on imports of ODS containing equipment and mandatory ODS recovery and recycling practices. The sustenance of the achieved outcomes will depend on continuation of institutional support. Armenia as Article 5 country will be entitled for such support from the Multilateral Fund.

304. The active Refrigeration Association is providing a good support to the NOU in training and monitoring of refrigerant recovery and recycling operations. There is a good chance that this institution will maintain its position and continue its support in the future creating conditions for the sustainability of project outcomes.

8.1.4.2.3 Environmental

305. In short-term, the risk of illegal trade is not high in Armenia because of availability of stockpiled CFCs accumulated on a legal basis. The established recovery and recycling system yielded about 5.6 ODP tonnes of CFC-12 and 3.7 ODP tonnes of HCFC-22 for the three years operation (2006 to 2008). The role of the recovery and recycling will be growing because of the continuous demand for CFC-12 for servicing old refrigeration equipment. In the long-term perspective, the NOU should be vigilant and undertake efforts on promotion and enforcement of additional legislation to maintain the environmental sustainability of the project.

8.1.4.3 Achievement of outputs and activities

306. The expected outputs and activities have been formulated on the basis of the detailed overall project description. Several activities have not been reflected in the project document such as procurement and distribution of ODS identifiers, and have been added to the matrix in Table 2. Most of planned outputs and activities have been accomplished. Others have been in the process of implementation at the time of evaluation and scheduled for completion upon the closure of the sub-project. The NOU needs to pay attention on continuation of hands-on training in refrigeration servicing industry, and development and promotion of a regulatory framework for the refrigeration sector which will enforce good maintenance and servicing practices.

307. The achievement of outputs and activities is analysed in Section: Attainment of objectives and

planned results - Effectiveness.

8.1.4.4 Catalytic role

308. The catalytic role of the IS project can be traced through increased penetration of new non-ODS refrigeration end-user equipment and introduction of good servicing practices. Those who received training under the project apply good practices in servicing the refrigeration equipment transmit this knowledge to the new generation of servicing personnel. The Refrigeration Association is active in dissemination of new knowledge and information among its members. The wide dissemination of information about the threats to the ozone layer contributed in promoting ODS-free equipment and its acceptance by the general public. The IS project had an influence on the attitude of companies and servicing technicians in regard to ODS alternatives in the refrigeration and air-conditioning sector. It is difficult, however, to differentiate between the effects of the training programme, the awareness-raising component, Government regulatory measures restricting ODS supply and market forces.

8.1.4.5 Assessment of Monitoring and Evaluation Systems

8.1.4.5.1 M&E design

309. The M&E system specifies the routine monitoring of the sub-project implementation through the series of management reports to be prepared and submitted by the NOU to UNEP GEF Coordination Office on programmatic and financial aspects (progress, terminal and financial reports). The NOU substantive reports serve as a basis for formulating annual UNEP Project Implementation Reports submitted to the funding agency i.e. GEF Secretariat. The Task Manager noted in its 2008 PIR that these reports seem to meet UNEP, DTIE's needs and thus to be adequate and they have been submitted in a timely manner. However, the data and thus the quality of the reports remain suspect as there is no obligatory internal data reporting and quality assurance program (from a technical perspective) requirements in place in most countries surveyed. It is the UNEP's view that most reports are likely reviewed more from a political perspective.

310. The M&A design stipulates that an internal desk evaluation should be carried out by the Ministry of Nature Protection at the end of the project. The M&E design needs to be modified to ensure that the Ministry of Nature Protection (MNP) is involved in overseeing all aspects of the National ODS phase-out plan and conducts regular monitoring and evaluation of the project activities. All monitoring and evaluation procedures have to be coordinated between the different stakeholders in an open forum manner. Furthermore, many of the cooperating institutions and partner agencies are expected to be involved in the M&E process to different degree as well.

311. In the 2008 PIR, the overall quality of the Monitoring &Evaluation Plan was assessed as satisfactory and stated that M&E Plan contains the three required indicators: Baseline information for each outcome-level; SMART indicators to track project outcomes, and clear distribution of responsibilities for monitoring project progress. The analysis of the project document shows that monitoring and evaluation of outcomes of several activities was not satisfactory due to the lack of baseline information and measurable, attributable and traceable indicators.

312. Thus, the effectiveness of awareness campaign was assessed by the number of leaflets, published articles and events involving mass media etc. However, there was neither a baseline established, nor performance indicators developed, that could be used to monitor the impact of the awareness raising campaign on ODS phase-out activities in the country. It was not possible to measure the impact of the training activities in the refrigeration servicing sector. The project brief put forward the ODS phase-out target of the training program to be 3.0 ODP tonnes phase out. This target was dropped in the project document approved by UNEP. The introduction of good practices in the refrigerant management has definitely contributed to the ODS overall phase-out. However, the number of trained technicians is not a far-reaching indicator. The attribution of the training programme to the reduction of ODS emissions requires knowledge of the baseline and specific data on post-training level of ODS use in the sector. Similarly, additional indicators are required (apart from the number of customs officers trained) in order to assess the contribution of the customs training component into the reduction of the illegal trade and enforcement of the ODS licensing system.

313. The issue of appropriate performance indicators in M&E systems is prominently reflected in the Mid-term Evaluation Report and in 2008 PIR prepared by the Project Task Manager.

314. The M&E Plan stipulated that standard evaluation of the project should be carried out according to the established GEF Evaluation Procedures and Guidelines. The supervision missions are envisaged to be conducted by the UNEP Task Manager and/or UNEP Fund Management Officer as well as regular meetings of the Project Steering Committee.

8.1.4.5.2 M&E plan implementation

315. The timeliness of reporting of ODS consumption data and ODS consumption per se were the paramount performance indicators that have been under constant scrutiny by the Ozone Secretariat and the Implementation Committee. The NOU carried out monitoring of consumption of ODS based on permits issued to importers by MNP and data provided the State Customs Committee on import/export of ODS. The NOU capacity was sufficient to meet the annual reporting requirements as per Article 7 of the MP. According to the Project Task Manager' assessment, substantive reports have been presented in a timely manner, complete and accurate with a good analysis of project progress and implementation issues. The NOU carried out data collection and analysis on ODS consumption, import/export and compiled the relevant reports to the Ozone Secretariat as required under Article 7 of the Montreal Protocol.

316. The Task Manager noted in its PIRs that the NOU progress reports met UNEP requirements. In general, however, the data and thus the quality of the reports remained suspect as there were no mandatory internal data quality control requirements (from a technical perspective) in place in most CEIT countries surveyed. Most reports are likely reviewed internally more from a political perspective. The evaluator observed that in Armenia, the involvement of professional local consultants and participation of the Refrigeration Association provided the expertise to NOU in better quality control of reported data. The enterprises that received the recovery and recycling equipment reported quarterly to the NOU on quantities of recovered and recycled ODS and the use of alternative non-ODS refrigerants. This reporting was under routine supervision of the designated consultant funded by UNDP under the specific R&R monitoring component. The provincial ecological authorities were not involved in collecting data on consumption, and recovered and recycled ODS.

317. The Project Steering Committee (PSC) has an important role to play in the implementation of the M&E Plan. The First Steering Committee Meeting was held in March 2005, since it was already recognised that there was a need to immediately update work planning, explain reporting procedures and make budget amendments to make up for the 2-month delay in project start-up. The PSC Meeting was attended by the Deputy Minister of the Ministry of Nature Protection and other ministry representatives, NOU staff, refrigeration experts, the State Customs Committee, UNDP and UNEP representatives (training officers, the Task Manager and Fund Management Officer), a public awareness expert, as well as a representative from the ECA Network. The meeting allowed input from partners on work planning and initiation of the licensing system and provided advice on administrative arrangements, particularly as related to procurement and management of disbursement. The M&E issues, including the quality control of reporting data have not been included in the agenda of the PSC meeting. It appears that no more PSC meetings have been arranged as well as supervisory visits of the Task Manager and Fund Manager Officer to the country.

318. The M&E Plan stipulated that standard evaluation of the project should be carried out according to the established GEF Evaluation Procedures and Guidelines in addition to the standard mid-term and final evaluation of the project per UNEP procedures. The present mid-term evaluation in Armenia coincided with the GEF Impact Evaluation of GEF ODS Phase out Projects in CEITs. The report on the Impact Evaluation is available on the GEF EO web site. [52]

8.1.4.5.3 Budgeting and Funding for M&E activities

319. The internal monitoring of ODS phase out activities by the NOU staff and local consultants was covered from the budget of the IS project. There is no specific budget line in the project budget to cover cost of the implementation of the M&E Plan. The monitoring functions were part of

[52] http://www.thegef.org/gef/node/2226 and http://www.thegef.org/gef/node/2227

working responsibilities of UNEP TM and FMO. The IS project budget included the budget lines "Technical assistance and project supervision by UNEP DTIE" of $8,000 and "Other IS-UNEP fee, etc." of $21,000 for three years. The evaluation team had no access to UNEP financial documents to elaborate on this issue further.

8.1.4.5.4 Long-term Monitoring

320. The long-term monitoring is extremely important for the sustenance of achieved outcomes of the Project in Armenia. The financial support of the long-term monitoring activities is part of the IS support from the Multilateral Fund that Armenia will be entitled as Article 5 country upon completion of the GEF project. The XXI Meeting of the Parties took the principle decision on the extension of the institutional strengthening funding for Article 5 countries beyond 2010. The specific timeframe and other parameters of IS funding are under discussion of the MLF Executive Committee in the context of funding of HCFC phase out activities in Article 5 countries. Meanwhile, the Government continues fulfilling requirements of the Montreal Protocol on reporting Article 7 ODS consumption data to the Ozone Secretariat.

8.1.4.6 Assessment of processes that affected attainment of project results

8.1.4.6.1 Preparation and readiness

321. The GEF intervention in CEITs addressing the ODS phase out issues was based in great extent on the experience gained by the Multilateral Fund and its implementing agencies (UNEP, UNDP, World Bank, UNIDO) in Article 5 countries. The GEF intervention in Armenia followed the strategy that proved to be successful in many Article 5 countries i.e. as a first step, preparation of the Country Programme and the Refrigerant Management Plant with direct involvement of the Government and other stakeholders concerned. The preparation of these strategic documents contributed greatly into the development and design of the package of the GEF ODS phase out projects in Armenia. UNEP is responsible for the implementation of non-investment activities at the institutional level, including the institutional strengthening and capacity building activities, awareness programme and training components. UNDP together with UNOPS provided assistance implementing investment projects in sectors representing the bulk of ODS consumption. UNEP and UNDP actively participated in similar undertakings and were very much familiar with challenges they faced in Armenia.

322. The project was approved by the GEF Council in October 2002 for Armenia as a CEIT. However, the project did not get GEF CEO endorsement until November 2004, because Armenia changed its Montreal Protocol status from Article 2 to Article 5 around the time of approval. This caused policy conflicts since Article 5 countries are to be funded by the Multilateral Fund to the Montreal Protocol, while GEF funded CEITs as Article 2 countries. Armenia managed to ratify the London Amendment only in November 2003. Finally, a decision was reached to permit Armenia, UNEP and UNDP/UNOPS to proceed with implementation of the project maintaining GEF funding. This political impasse delayed the start up of the project for about a year.

323. Yet, the certain difference exists in institutional support to NOUs created in CEITs by GEF and Article 5 countries by MLF. On the preparation stage, the initial training of NOUs in CEITs was provided at series of regional workshops organised by UNEP. Such an approach does not ensure the continuity of expertise in case of rotation of personnel in NOUs and its sustainability. The MLF created a networking system of Article 5 NOUs in each geographical region, including the East European and Central Asia (ECA) network. The network meetings have been carrying out on an annual basis. Each network is supported by a regional office established under UNEP Compliance Assistance Program (CAP). The networking system and CAP, among other, allow for providing timely assistance to newly appointed NOU personnel. As a CEIT and Article 5 country, Armenia benefited subsequently from participation in both UNEP regional workshops and in ECA Network. The participation in these *fora* enhanced the readiness of the NO*U*.

324. In the original project design, the duration of the project was 37 months, from December 2004 to December 2007. There was a couple of month slippage in the start up of the project due to UNEP administrative reasons. The real challenge, however, was to the timely adoption of the required legislation. The allocated 12-month period proved to be too short. It took 27 months to draft and adopt the required law and sub-legislative acts. Consequently, the training components had to be rescheduled and the project was extended first until 2008 and then to 2009. UNEP grossly

underestimated the time necessary for the accomplishment of planned activities. The preceding experience of UNEP in Article 5 countries demonstrated that adoption of the legislative package usually require much longer than 12 month period allocated in the Armenia implementation plan.

325. The project design is not sufficiently flexible to tackle new emerging issues associated with other than CFC controlled substances such as halons and methyl bromide. The change of its Montreal Protocol status from Article 2 to Article 5 country proved to be beneficial for Armenia facilitating the assistance provided from the MLF on phasing out methyl bromide, halons and MDI.

8.1.4.6.2 Country commitment

326. Armenia ratified the Vienna Convention, Montreal Protocol and all its amendments demonstrating its commitment to ozone international treaties. The Government of Armenia approved the ODS Phase out Country Programme that was elaborated with the assistance of UNEP and UNDP, and committed to undertake a series of measures leading to the phase out the ODS consumption by January 2009. The Government commitments and priorities have been expressed in the Country Programme that created the basis for the development of the GEF ODS phase out project. The Government supported the implementation of key components identified in the Project: establishment of the NOU, adoption of the required legislation, training of customs officers and refrigeration servicing technicians; recovery and recycling programs and investment projects in the refrigeration and aerosol industry.

327. The Minister of the MNP was designated as the project manager of all ODS related activities. In this capacity, he participated in the first meeting of the Project Steering Committee. He also was directly involved in promotion of ODS legislation in the National Parliament. The MNP provided its premises for the NOU and offered co-financing covering the cost of utilities and communication. The Deputy Minister is engaged in everyday interaction with the NOU providing the necessary support and interacting with Governmental bodies involved.

8.1.4.6.3 Stakeholder involvement

328. The implementation of National ODS Phase out Programme and GEF funded activities required interaction of the NOU and MNP with a number of national stakeholders, including the State Customs Committee, Ministry of Education, Ministry of Justice, Ministry of Health, Ministry of Agriculture, NGOs, mass media and implementing agencies. The NOU is in close communication with refrigeration servicing enterprises involved in training and recovery/recycling projects and with end-users of commercial refrigeration equipment that are beneficiaries of the incentive retrofit and replacement programme. The NOU coordinated the implementation of two industry investment conversion projects in “SAGA” and “Yerevan Aerosol” that required the regular NOU communication with UNDP/UNOPS and their consultants, local UNDP office, and the State Customs Committee to clear the imported equipment. The NOU interacted with several NGOs on different aspects of ODS phase out programme (ECOTEAM, Consumer National Association, International Academy of Ecology, Caucasus Environmental NGO Network, National Institute of Standards). The important assistance was provided from Khazer NGO in the implementation of the public awareness campaign. The Refrigeration Association is very actively involved in supporting NOU activities in the refrigeration sector.

329. The broad participation of governmental agencies and NGOs in the ODS phase out programme shows a good sense of project ownership.

8.1.4.6.4 Financial planning

330. The GEF approved budget covered all the activities envisaged in the project. The financial planning and control is under the responsibility of the UNEP DGEF. The allocation of cash was based on the review of quarterly project expenditure accounts, showing amount budgeted for the year and amount expended since the beginning of the year, plans of future actions and requests for cash advances prepared by the NOU. The monies have been transferred to the NOU through local UNDP office in Yerevan. The NOU activities and accounting were subject to regular national financial auditing on an annual basis. Copies of the audit reports were forwarded to UNEP. Changes in the USD rate of exchange against the Armenian currency have been problematic, at times requiring minor changes to the budget allocations. There were separate

meetings with UNDP Armenia office to streamline communications between UNEP and that office for the transfer of funds and other services for the project. The project was extended beyond the originally planned schedule maintaining the same budget.

331. The evaluation team has not been provided with the access to financial planning and reporting documents and, therefore, is not in a position to comment on the appropriateness of financial planning standards applied by UNEP and UNDP.

8.1.4.6.5 UNEP / UNDP Supervision and backstopping

332. UNEP was a lead agency in the country program preparation and in implementation of institutional strengthening and capacity building, awareness raising and training activities. UNEP DTIE and DGEF was a responsible supervising organization since the inception of the NOU. The First Steering Committee Meeting (PSC) held in March 10-11, 2005. The PSC Meeting was attended by the First Deputy Minister of the Ministry of Nature Protection and government and private sector stakeholders, UNDP and UNEP representatives (training officers, the UNEP Task Manager and Fund Management Officer), a public awareness expert, as well as a representative from the MLF Eastern Europe and Central Asia Network. Separate meetings held with UNDP representative to give advice on administrative arrangements, (particularly as relates to procurement and management of disbursement) and to streamline communications between UNEP and UNDP for the transfer of funds and other services for the project. The total of $8,000 was allocated for technical assistance and project supervision by UNEP DTIE. There were no country visits by UNEP staff since March 2005.

333. The supervision was conducted through reviewing the regular quarterly and semi-annual substantive and financial reports provided by the NOU to UNEP DTIE and DGEF. The NOU is in close interaction with UNEP DTIE through participation in the ECA Network and Compliance Assistance Programme.

334. UNDP engaged its country office in Yerevan that provided interactions with the Government and also served as a financial institution supporting UNDP investment activities and UNEPs institutional strengthening and training components. The NOU is in close contact with the UNDP country office. The evaluator visited the UNDP country office in Yerevan and had a discussion with the dedicated officer (Program Analyst) and UN Resident Coordinator who characterized the GEF ODS Phase out Project as a very successful one.

335. The present mid-term evaluation was organized and funded by UNEP as part of the M&E Plan.

8.1.4.6.6 Co-financing and Project Outcomes & Sustainability

336. The Government assessed its co-financing of the IS component amounting to $42,000 (in-kind) for three years (2005-2007) that covered the office space, local telephone, office furniture, and local travel. A part time assistance was also provided by the Ministry personnel. Reporting of in-kind co-financing was not a part of the original project reporting. There have been no official lists of leveraged resources for the projects of the ODS portfolio, as this was never mandatory for ODS projects.

337. The Government support continued after 2007 when the project was extended until 2010 within the same budget. It is assumed that this in-kind support maintained at a comparable level. Then, the current level of the Government contribution on the annual basis can be assessed as one third of the declared contribution to the IS project i.e. $14,000 a year. The future of the NOU beyond 2010 will depend on MLF policies on continuation of the IS support in Article 5 countries that are now under discussion by the MLF Executive Committee. The continuation of NOU funding is linked with accelerated phase out of HCFCs in Article 5 countries and development of HCFC Phase out Management Programmes (HPMP) that would require establishment of Programme Management Units (PMU). Once PMUs have been established under an HPMP, there may be merit in exploring further the relationship between the NOU and the PMU, with a view to re-balancing the funding of institutional support between the two institutions so that Fund resources are clearly distinguished between continuing institutional support for the NOU, and those more directly related to the primary future goal of supporting the achievement of HCFC phase-out.

338. The work on preparation of HPMP is ongoing in Armenia with assistance from UNDP. The support

of the Government to the NOU will be crucial in near term until the MLF funding is provided for the NOU and HPMP activities.

8.1.4.6.7 Delays and Project Outcomes & Sustainability

339. The delay in implementation of IS and training components was not critical for meeting 50% and 85 % ODS reduction targets in 2005 and 2007 respectively. The extension of IS project until 2009 helped to continue operations of the NOU and complete Incentive Retrofit and Replacement Project and meet 2010 zero CFC consumption target. The sustainability of outcomes depends very much on continuing support of the NOU from the Government and the MLF.

8.1.4.7 Project ratings

340. The ratings of the IS project have been performed according to categories and criteria specified in Annex 1 of the Terms of Reference of the evaluation. The ratings are presented in

341. Table 10.

Table 10: Ratings for the Institutional Strengthening project in Armenia

Criterion	Evaluator's Summary Comments	Rating
Attainment of project objectives and results (overall rating)	All the objectives have been attained. The project has minor shortcomings in terms of effectiveness and efficiency.	**S**
Effectiveness	All the objectives established in the project have been fully or nearly fully achieved. The NOU is mature to tackle remaining challenges associated with phasing out of methyl bromide, managing halon banks, replacing CFC-based MDI and dealing with accelerated phase out of HCFCs with assistance from MLF.	**S**
Relevance	All project outcomes are fully consistent with GEF strategy in ozone and climate focal area and Government priorities.	**HS**
Efficiency	The objectives achieved in relation to the cost and time make the IS sub-project relatively effective. The project has been extended to 2009 to finalize the remaining ongoing activities and ensure the achievement of zero ODP consumption by the 1 January 2010.	**S**
Sustainability of Project outcomes (overall rating)	There is a high probability of sustenance of positive project outcomes and impacts in the distant future.	**S**
Financial	The GEF financing of the NOU stopped in 2009. As Article 5 country, Armenia is entitled for institutional strengthening assistance from the Multilateral Fund upon completion of the GEF project enhancing the chance of sustainability of achieved outcomes.	**S**
Socio Political	There are no visible social or political risks that may jeopardize sustenance of project outcomes. The major stakeholders remain actively involved in ODS phase out activities.	**S**

Criterion	Evaluator's Summary Comments	Rating
Institutional framework and governance	Government commitments, legislative and enforcement measures prove to be sufficient enough to maintain the sustainability of project outcomes.	**S**
Environmental	The 2005 and 2007 MP phase out targets were achieved. There is a good chance to meet 2010 zero CFC consumption target. In near term, the risk of ODS illegal trade is not high.	**S**
Achievement of outputs and activities	Almost all outputs were achieved. The implemented outputs and activities created a base for attaining objectives and meeting planned outcomes.	**S**
Monitoring and Evaluation (overall rating)	The design of the IS project is not reflective of state-of-the-art project management. Reportedly, the implementation of M&E plan was good quality.	**MS**
M&E Design	The design of the IS project is not reflective of state-of-the-art project management practices and lacking of result-based management and accountability framework. Most of project components have neither a baseline established, nor SMART performance indicators developed. Risk analysis was also not a part of project design.	**MU**
M&E Plan Implementation (use for adaptive management)	As designed, the M&E Plan was implemented in a satisfactory manner. Apart from one meeting in Yerevan in March 2005, there were no supervisory missions of UNEP staff.	**MS**
Budgeting and Funding for M&E activities	The internal monitoring of ODS phase out activities by the NOU staff and local consultants was covered from the budget of the IS project.	**S**
Catalytic Role	The catalytic role of the IS project can be traced through increased penetration of new non-ODS refrigeration end-user equipment and the use of good servicing practices.	No ratings are requested for the catalytic role.
Preparation and readiness	The NOU participated in several preparatory activities organized by UNEP. The project document was closely related to the country programme approved by the Government. UNEP, however, grossly underestimated the time necessary for the accomplishment of planned activities. The project design was lacking the log-frame and effective performance indicators. The project design is not sufficiently flexible to tackle new emerging issues.	**S**
Country ownership /	Armenia ratified the Vienna Convention,	**HS**

Criterion	Evaluator's Summary Comments	Rating
commitments	Montreal Protocol and all its amendments demonstrating its commitment to ozone international treaties. The Government supported the implementation of key components identified in the project. The First Deputy Minister is engaged in everyday communication with the NOU providing the necessary support and interacting with Government entities involved.	
Stakeholders involvement	The project involved all relevant Government and NGO stakeholders in project preparation and execution.	**HS**
Financial planning	The GEF approved budget covered all the activities envisaged in the project. The project had no serious shortcomings in flow of funds that would have negative impact on planned activities and timely delivery of outputs. The project was extended beyond the originally planned schedule maintaining the same budget.	**S**
UNEP Supervision and backstopping	UNEP and UNDP have been successfully fulfilling their role of supervisory agencies.	**S**
Overall Rating	There are good achievements in the implementation of all components. Apart from shortcomings in the design of M&E, all the rating criteria have been well satisfied.	**S**

*8.1.5 ARM/04/** - National programme for recovery and recycling of ODS refrigerants, including Monitoring of RMP Activities (UNDP/UNOPS);*

8.1.5.1 Background

342. The country programme identified the total ODS consumption in 2000 to be 172.7 ODP tonnes. Only 6.0 ODP tonnes was in the refrigeration assembly and manufacturing sector. About 160 ODP or 92% of the total consumption was in the refrigeration servicing sector. The sector dealt with servicing of about 1,145,000 domestic refrigerators, 17,500 commercial unitary equipment, and 1,760 cold rooms of different capacity. There were about 7,000 vehicles equipped with CFC-based Mobile Air Conditioner (MAC) systems. The ODS phase out in the refrigeration servicing sector requires a systematic approach based on a wide-ranging strategy encompassing training, technical assistance and regulatory support. The Government of Armenia approved the Refrigerant Management Plan (RMP) as part of its Country Programme which addressed the ODS phase out in the refrigeration sector. The comprehensive national program for recovery and recycling of refrigerants in the refrigeration and air conditioning sub-sectors (R&R Programme) was designed as part of the RMP.

343. The refrigerant recovery involves the removal of the refrigerant in vapour or liquid form for reuse or storing in an external container for subsequent recycling or destruction without testing or processing it. The refrigerant recycling means to process the contaminated refrigerant through oil separators and filter dryers using a recycling machine working predominantly at a local service shop. The refrigerant reclamation requires that the contaminated refrigerant be reprocessed using evaporation, segregation and distillation operations to meet new product specifications. The reclamation infrastructure represents a significant investment and may only be economical for large quantities of recovered refrigerant. In Armenia, reclamation equipment was not part of the UNDP project.

8.1.5.2 Attainment of objectives and planned results

8.1.5.2.1 Objectives, outputs, outcomes and performance indicators

344. The objectives of the UNDP R&R project were to assist the Government in phasing out consumption of CFCs by 2009 as established in the Country Programme for Armenia. The GEF funding amounted to $649,410 including monitoring component. The ODS phase out target of the program was determined to be 27.4 ODP tonnes. The R&R Project aimed to provide a number of portable refrigerant recovery machines, including refrigeration servicing kits, and manual recovery pumps with plastic storage bags. The project also provided several sets of recycling equipment strategically distributed around the country. Training/demonstration seminars for technicians performing repairs, maintenance and installation of refrigeration and air conditioning equipment were important to familiarize all involved with the RMP, the National Recovery and Recycling Programme and good servicing practices. A system for monitoring the ODS recycling and recovery operations was also a part of the RMP and was complemented to the R&R project to ensure the effective monitoring of the implementation of the project.

345. The outcomes were defined as introduction of refrigerant recovery and recycling practices throughout out the country, resulting in the decrease of national CFC demand and the reduction of ODS emissions into the atmosphere. The outputs were defined as follows: delivery of the necessary R&R and servicing equipment to selected refrigeration servicing workshops; training of refrigeration technicians; lending technical support and provision of technical information; demonstration of recovery and recycling procedures and good servicing practices to refrigeration technicians. The NOU and the national consultant took responsibilities for monitoring the recovery and recycling operations. The logframe matrix incorporated in the UNDP project brief is not detailed enough for the evaluation of the R&R project and its monitoring component. The performance indicators were inferred from the outputs/deliverables contained in the UNDP project documents (Table 11).

Table 11: ODS Recovery and Recycling Project in Armenia: Objectives/ Intended Results - Outputs/Deliverables - Outcomes/Performance indicators

Objectives/Intended Results	Outputs/Deliverables	Outcomes/Performance indicators
1. Introduction of sustainable refrigerant containment and R&R practices and reduction in ODS emissions into the atmosphere 2. Reduction in CFC demand to meet CFC phase out 2007 and 2010 targets established in the Montreal Protocol	1. Procurement and delivery of servicing, and recovery and recycling equipment to the country 2. Development and promotion of legislation supporting R&R operations 3. Development and distribution of R&R manuals and regulations 4. Selection of participants and conducting training/demonstration workshops on good servicing and R&R practices and certification of graduates 5. Distribution of R&R and servicing equipment among	1. Adoption of legislation supporting R&R operations 2. Establishment of ODS recovery and recycling system in the refrigeration and air-conditioning sector 3. Attainment of ODS phase out targets through the reduction of demand and use of recovered and recycled ODS in the servicing sector • Timely adoption of ODS imports licensing and quota system • Proper timing in procurement and delivery of R&R equipment (Q2/2005) ; • Preparation and translation

Objectives/Intended Results	Outputs/Deliverables	Outcomes/Performance indicators
	servicing workshops 6. Establishing a R&R monitoring system 7. Reporting R&R results	of R&R training materials; • Number of R&R trained and certified refrigeration technicians (200 technicians) ; • Number of R&R machines distributed to servicing workshops; • Increase in CFC prices in relation to substitutes; • Timely commencement of R&R operations (Q3/2005); • Quantity of ODS recovered and recycled (27.4 ODP tonnes annually); • Adoption of legislation promoting recovery and recycling operations; • Economic cost/benefits of adopted R&R programme; • Availability of R&R monitoring system during and after the project; • The availability of R&R data in the NOU and UNDP;

8.1.5.2.2 Effectiveness

346. A survey, conducted by the Ministry of Nature Protection of the Armenian Republic in 2001, indicated that there were more than 750 refrigeration technicians in the country. The survey also indicated that there were 42 companies of different sizes in the country that carried out servicing, maintenance and repair of domestic, commercial and industrial refrigeration equipment, some of them also serviced air conditioning units. Through the funding provided by the GEF the following equipment was purchased: 5 sets of recovery and recycling machines for the refrigeration sector and two recovery and recycling machines designed for servicing mobile air-conditioners, including vacuum pumps for handling storage cylinders and refrigerant identifiers; 70 sets of servicing equipment designed for servicing predominantly commercial refrigeration equipment, including 70 refrigerant recovery machines; and 100 sets of equipment for servicing domestic refrigeration appliances, including 100 manual pumps and 400 plastic bag, refrigerant cylinders and recovery and servicing kits, including manifolds, hoses, tools and accessories, electronic leak detectors and weighing scales. Spare parts were included in the delivery package.

347. The NOU selected potential beneficiaries among registered servicing workshops and refrigerant distributors on the basis of their pattern and quantities of CFC refrigerants used in their servicing operations. The NOU with assistance from the international consultant held five training/demonstration workshops: 4 workshops were organized in Yerevan and 1 in Vanadzor. 260 refrigeration technicians were trained in using the recovery and recycling equipment as part of good practices in servicing the refrigeration equipment. Five recovery and recycling machines were installed in refrigerant recovery and recycling centres established in major cities in Armenia: two in Yerevan, one in Gyumri, one in Vanadzor and one in Ararat valley. The evaluation team visited two recovery and recycling centre: one in Yerevan and another in Ararat Valley as well as one beneficiary of the refrigerant recovery equipment. Both centres are strategically located and active. The Yerevan centre is a multifunctional facility selling, all kind of refrigerants, spare parts, compressors and providing servicing. The clients bring CFC-12 or HCFC-22 refrigerants for

reclamation once they need to buy something in the shop. The centre buys contaminated refrigerant for 250-300 drum for 1 kg (equivalent of $0.80) and sell reclaimed refrigerant for about 600 drums for 1 kg making profit about $1.00 per kg.

348. Another recycling centre is located in Artashat (Ararat Valley), where almost all households are engaged in growing fruits (apricots, apples and pears). Typically, a household has a cold room in the basement equipped with a refrigeration unit with a charge of about 2 to 6 kg of CFC-12 or HCFC-22 refrigerant. There about 2,000 refrigeration units around the place and about 80% of them are working with CFC-12 refrigerant. The R&R centre is equipped with three recovery machines and one recycling machine. Typically, the cost of reclamation is about $0.3 per kg of CFC-12 or HCFC-22.

349. It appears that the funding allocated by the GEF has been sensibly used for establishing the monitoring system. With the assistance of the national refrigeration consultant the NOU distributed the R/R equipment in strategic locations in the country to ensure the most effective R/R operations in terms of recovered and reused refrigerant. The potential beneficiaries of equipment have been assessed through the survey conducted during preparation of the Project and on the basis of information available in the National Refrigeration Association. The major criterion was the volume of the refrigerant handled by the company. The equipment was distributed accordingly. All the equipment supplied under this project had been provided to the beneficiaries on a grant basis. The title of ownership of the machines and equipment provided under the GEF will be kept by the Ministry of Nature Protection of the Armenian Republic throughout the duration of the project and then transferred to the users. The transfer will be subject to final evaluation of the activities carried out by the individual users. The NOU has the complete inventory of beneficiaries with their address and phone number. The consultant keeps the records of the maintenance of R&R equipment.

350. The evaluation team found that the recovery and recycling equipment is in place and in working condition. The owners are satisfied with the equipment except plastic bags and manual pumps that have not been used very much because of their low efficiency.

351. The beneficiaries of R/R keep records of the amounts of ODS recovered and recycled and report monthly to the national consultant. The consultant pays regular visits to beneficiaries. The consultant checks the reported data from recycling centres by reading of the time on the particular recycling machine. The running time of a machine corresponds to the quantities of recycled refrigerant. The consultant registers also all the problems related to the operation of the equipment. A computer database has been set up to handle the information received from the service centres and individual enterprises. The consultant presents his report to UNDP quarterly. The data on the recovered and reclaimed CFC-12 and HCFC-22 refrigerants are shown in Table 12 for 2006 to 2008.

Table 12: Quantities of recovered and recycled refrigerants in Armenia from 2006 to 2008 (kg)

Year	R12 Recovered	R12 Recycled	Percent R12 Recycled/ Recovered	R22 Recover ed	R22 Recycled	% R22 Recycled/ Recovered
2006	2,599	456	17.55	1,321	198	14.99
2007	2,198	1,355	61.65	1,387	880	63.45
2008	862	495	57.42	1,081	673	62.26
Total	5,659	2,306		3,789	1,751	

352. The quantities of CFCs recovered in 2006-2008 show a declining trend indicating to the diminishing number of CFC-based systems that have been replacing by ODS free equipment. The overall quantity of recovered and reused refrigerants is short of the target of 27 ODP tonnes to be recovered and recycled annually. It appears that the target in the project document was highly overestimated. The target in the R&R project was established on the basis of the capacity and number of provided recovery and recycling machines rather than on the frequency of repairs and potential availability of the refrigerant for recovery and recycling. The average quantity of

recovered CFC-12 constitutes about 6.5% of the CFC consumption in the refrigeration servicing sector in 2006-2008. The quantities of reachable and recyclable CFC-12 refrigerant in the domestic refrigeration sector constitute about one third of the same refrigerant in the commercial refrigeration sector[53]. Given that the significant portion of servicing is associated with domestic refrigeration appliances, the 6.5% share is close to technically reachable and recyclable CFC-12 quantities in the sector.[54]

353. No data are available on recovered contaminated refrigerants. There is no facility in Armenia to collect and store not reusable refrigerants and usually they are being vented to the atmosphere.

354. The historical data on the relative prices of CFCs and their alternatives can serve as a key economic indicator of potential profitability of R&R operations. Average prices for refrigerants in Armenia that have been provided by the NOU are shown in Table 13. The 2008 refrigerant prices correspond to those displayed in the shops visited by the evaluation team. A significant increase in CFC-12 price was observed in 2008 signifying the decrease in supply and availability of this refrigerant on the market creating more incentives for refrigerant recovery and recycling operations.

Table 13: Average prices of refrigerants in Armenia from 2006 to 2008

Refrigerant	2006	2007	2008
CFC-12	4.11	4.87	8.20
HCFC-22	3.60	4.22	5.90
HFC 134a	6.85	6.5	11.48
R-404A		13.0	16.39
R-407C			16.39
R-410A			16.39
Isobutane (HC - 600a)			57.37

355. The program on the monitoring of R&R activities proved to be very effective tool to render judgment on the efficiency of the program. The detailed quarterly reports have been regularly presented to the UNDP international consultant. It stems from these reports that the national consultant monitored very closely operations of the owners of R&R equipment. The Refrigeration Association was also involved in the monitoring and provided viable assistance to the consultant and the NOU. The data collected in the course of the monitoring demonstrate that recycling machines were actively used for reclamation of about 40% and 46% of recovered CFC-12 and HCFC-22 respectively.

356. The R&R program was quite successful. The total of about 5.7 tonnes of CFC-12 and 3.8 tonnes of HCFC-22 have recovered and reused for the last three years avoiding emission of about 6 ODP tonnes into the atmosphere. The annual rate of utilization of recovery and recycling machines is about 45 kg and 270 kg of ODS per machine respectively. The R&R equipment will be continuously used in future years for recovery and recycling of CFC and HCFC refrigerants.

357. The evaluation team was reported about the lack of servicing facility in Armenia dealing with repair of recycling and recovery machines and other refrigeration servicing equipment. UNDP

53 Report of the meeting of experts to assess the extent of current and future requirements for the collection and disposition of non-reusable and unwanted ODS in Article 5 countries; UNEP/OzL.Pro/ExCom/48/42; 20 March 2006

54 It was estimated by the TEAP that developing country demand for CFCs in the refrigeration sector is 30,000 tonnes in 2010 with only 2,639 tonnes of material available from recycling and reclamation. (about 8.8%). Report of the meeting of experts to assess the extent of current and future requirements for the collection and disposition of non-reusable and unwanted ODS in article 5 countries; UNEP/OzL.Pro/ExCom/48/42; 20 March 2006

needs to consider this factor in negotiating its future contracts with the suppliers of 3R equipment.

358. The project design envisaged introducing a retailer licensing scheme that would have made mandatory for servicing enterprises to obtain a retailer license for purchasing CFCs from wholesalers/importers. A pre-requisite for issuing such licenses would be that at least one technician of the servicing workshop had received training in good servicing practices and recovery and recycling. These regulatory measures have not been implemented. Certain economic and fiscal measures were envisaged in the country programme to discourage the import of CFCs and promote CFC alternatives but were not materialized.

8.1.5.2.3 Relevance

359. The R&R project is fully consistent with the GEF strategy in the ozone focal area and Armenia country programme. The recovery and recycling operations contributed to the reduction of ODS emissions into the atmosphere. Since most CFC refrigerants are also greenhouse gases, the reduction in ODS emissions was also a factor in reducing the threat of the global warming, bringing substantial benefits to the climate.

8.1.5.2.4 Efficiency

360. The timetable of the R&R project reflected the requirement to contribute to the achievement of 85% reduction target in 2007. According to the timetable, the recovery and recycling operations should start in six months time from the date of the GEF approval. The NOU started reporting on recovered and recycled ODS in January 2006 nine months after the GEF approval of the project document. Thus, the project contributed to the achievement of 2007 and 2010 targets established for Armenia by the Montreal Protocol.

361. The project incremental cost was determined to be $551,306. The cost-effectiveness of the project was determined by UNDP to be $20.12/kg ODP assuming the annual quantities of recovered ODS to be 27.4 ODP tonnes that was assessed on the basis. The actual cost-effectiveness can be calculated using actual annual average of ODP tonnes recovered and reused for three years of operations. The average amount of annual ODP phase out is 1.93 ODP tonnes resulting in cost-effectiveness of $285/kg ODP. The actual cost-effectiveness exceeded the target by a factor of ten.

362. The efficiency of R&R operations can also be assessed by calculating the percentage of recovered and reused refrigerants to the total ODS consumption in the refrigeration servicing sector. The average quantity of recovered CFC-12 constitutes was about 6.5% of the consumption in the refrigeration servicing sector in 2006-2008. Another efficiency indicator: the annual quantities of recovered and recycled ODS per each recovery and recycling machine are calculated to be about 45 kg and 270 kg of ODS per machine respectively. The calculated value of avoided imports of new ODS refrigerants is $45,440 for three years based on the local price of CFC-12 and HCFC-22 in the respective year.

8.1.5.3 Assessment of Sustainability of project outcomes

8.1.5.3.1 Financial resources

363. At the time of this evaluation, the project was ongoing. The national consultant continued his monitoring activities of R&R operations. The completion of the project was planned in May 2009. The NOU in close cooperation with the Refrigeration Association is planning to continue its assistance to the recovery and recycling programme subject to extension of institutional strengthening support from the Multilateral Fund.

364. The growing prices for CFC-12 and HCFC-22 create incentives for enhancement of refrigerant recovery activities. The actual profitability of recycling centres is about $1.00 per kg of recycled material. The owners of recovery and recycling equipment are positive about sustainability of their business.

8.1.5.3.2 Socio-political

365. The socio-political climate is stable. The Ministry of Nature Protection is prominent in the Governmental hierarchy and maintains working relationships with other stakeholders. The

existing regulatory regime on imports of ODS to the country and enforcement of this regime by the Customs prevent the risk of illegal trade that could undermine the economic viability of R&R operations. The socio-political risk to the sustenance of the project is low.

8.1.5.3.3 Institutional framework and governance

366. The Government is committed to support decisions of the Parties to the Montreal Protocol in regard to the accelerated phase out of HCFCs. The Government is closely cooperating with UNDP on the development of the national strategy on this matter. The recovery and recycling of HCFC refrigerants will be a component of this national strategy. The existing set up of the Ozone Office within the Governmental structure and good likelihood of continuation of financial support of the NOU from the MLF provide opportunities for further strengthening of legal framework and policies in regard to ODS phase out that will be beneficial for the sustainability of the outcomes of the R&R project.

8.1.5.3.4 Environmental

367. The availability of CFCs in the country is diminishing because of active regulatory regime and the replacement of CFC-based equipment with ozone safe equipment. The production of CFCs was stopped globally. The recovery and recycling of CFC-12 refrigerant will discontinue in Armenia in foreseeable future. However, the use of HCFC- and HFC-based refrigerant is growing. Therefore, the recovery and recycling equipment provided under the Project will be in use within the next decade.

8.1.5.4 Catalytic role

368. There are very rear cases of purchasing of R&R equipment by refrigeration technicians on their own. In the absence of the qualification and licensing regulations, there are no requirements for having recovery and recycling equipment for new companies entering the refrigeration servicing business. Economic considerations are the only factor that would stimulate servicing enterprises in purchasing R&R equipment. The cost of this equipment and subsequent economic opportunities, however, are not particularly favourable at this point of time. The growing use of HFC refrigerants that are much more costly may change the situation.

8.1.5.5 Achievement of outputs and activities

8.1.5.5.1 Delivered outputs

369. All the following planned outputs have been achieved:

- Procurement and delivery of servicing, and recovery and recycling equipment to the country;
- Development and promotion of legislation supporting R&R operations;
- Development and distribution of R&R manuals and regulations;
- Selection of participants and conducting training/demonstration workshops on good servicing and R&R practices and certification of graduates;
- Distribution of R&R and servicing equipment among servicing workshops;
- Establishing a R&R monitoring system;
- Reporting R&R results.

370. The development and promotion of legislation supporting R&R operations was not accomplished such as a retailer licensing scheme that would have made mandatory for servicing enterprises to obtain a retailer license for purchasing CFCs from wholesalers/importers.

371. The section on Effectiveness provides detailed account of quantity, quality and usefulness of accomplished outputs.

8.1.5.6 Assessment of Monitoring and Evaluation Systems

8.1.5.6.1 M&E design

372. UNDP developed a technical assistance component for monitoring of activities under the RMP focussing on the implementation of R&R project. The GEF allocated $54,000 covering the salary

and internal travel costs of the national consultant for five years. In particular the monitoring component had to ensure that: 1) The recovery and recycling equipment was distributed in the most effective way to maximize the quantities of recovered and reused refrigerant; 2) All the equipment was properly used, kept and maintained; 3) Proper records of the amounts of CFCs recovered, recycled and reused are maintained; 4) The consultant should prepare and submit annual reports to UNDP. The activities of the national consultant were supervised by the UNDP international consultant, including supervisory missions to the country.

373. The NOU was responsible for the organizing training and certification of servicing technicians through training/demonstration workshops funded by UNDP, and monitoring of distribution of R&R equipment among the repair and servicing workshops in the way to maximize the volume of recovered CFCs. The local consultant provided assistance to the NOU and to the international consultant in the selection of beneficiaries, training and certification of technicians.

374. The contracts between the NOU and beneficiaries envisaged that the ownership of the machines and equipment would be kept by the Government throughout the duration of the project and then transferred to the users. The transfer will be subject to final evaluation of the R&R activities carried out by UNDP.

375. The project document contains the timetable with major milestones such as approval of the project by the GEF, procurement and delivery of equipment, conducting demonstration workshops, distribution of equipment, starting recovery and recycling operations, setting up the monitoring system. The implementation schedule indicates the time interval (a quarter of the year) as a target for the accomplishment of specific milestones without linkages to specific dates. The timetable was used as a monitoring tool of R&R project. Reports of the national monitoring consultant were used as a major source of information to track progress towards achieving project outputs The ODS reduction and the number of servicing shops as beneficiaries were the only measurable indicators incorporated in the project document. The M&E design envisaged the evaluation of the progress through the evaluation missions of the UNDP consultant.

376. The M&E design of the monitoring component has very limited quantitative performance indicators. The major one was the number of R&R machines to be delivered. The expected quantities of recovered and recycled ODS and the cost-effectiveness have been assessed using wrong assumption and proved to be impractical. The following performance indicators could be added providing more enlightening information: 1) the annual utilization rate of recovery and recycling machines is terms of kg of ODS recovered/recycled per machine; 2) the percentage of recovered and reused refrigerants to the total ODS consumption in the refrigeration servicing sector; and 3) the calculated value of avoided imports of new ODS refrigerants in $ terms. The availability of this additional information would be helpful in optimizing the R&R system and making it more efficient.

8.1.5.6.2 M&E plan implementation

377. The GEF approved the R&R project in March 2005. According to the timetable, the duration of the project was 38 moths i.e. the completion of the project was due in July 2008. The project was extended until May 2009 using the same approved funding. The reports of the national monitoring consultant show that the R&R activities started in January 2006 with three months delay. The National Consultant monitored and ensured that: the recovery machines are distributed in the way to maximize the volume of recovered CFCs; all the equipment was properly used and maintained; proper records of the amounts of CFC recovered, recycled and reused are maintained. National Consultant set up a computer database to monitor the information received from servicing enterprises and recycling centres. The NOU reported the results to the UNDP Headquarters on the annual basis in 2006, 2007 and 2008. The reports contain comprehensive data on recovered and recycled CFC-12 and HCFC-22 which are based on quarterly data received from each owner of the R&R equipment. In the course of his field visits to servicing enterprises, the consultant identified malfunctioning equipment and wrong practices in using the equipment and took corrective measures.

378. Upon completion, the R&R project will be the object of tripartite review of the progress and evaluation report. The review will be conducted by representatives from the Government, the NOU and UNDP. UNDP will prepare the evaluation report.

8.1.5.6.3 Budgeting and Funding for M&E activities

379. The budget of the monitoring component amounts to $54,100 covering expenses of the national consultant for five years. The cost of evaluation missions of the international consultant is covered in the R&R project at $10,000.

8.1.5.6.4 Long-term Monitoring

380. The long term monitoring was envisaged as a responsibility of the Government once the project was terminated. There is a high likelihood of extension of the institutional strengthening support from the Multilateral Fund in relation to the Government commitments to accelerate the phase out of HCFCs. The monitoring of HCFC recovery and recycling activities appears to be one of responsibilities of the NOU in the coming future.

8.1.5.7 Assessment of processes that affected attainment of project results

8.1.5.7.1 Preparation and readiness

381. By the time of the implementation of the R&R project in Armenia, UNDP gained substantial experience in the implementation of R&R activities in Article 5 countries. The Government identified R&R activities as an important tool in achieving ODS phase out within the Refrigerant Management Plan that was a part of the Country Programme prepared by UNDP and UNEP. The strategy was to start the R&R activities as soon as possible to maximize their contribution to the reduction of ODS consumption in the refrigeration servicing sector. UNDP started preparatory work immediately after the project approval and allocation of funding by the GEF. The active involvement of the NOU, the Refrigeration Association and the local consultant was the part of the UNDP implementation strategy. The awareness campaign and training/demonstration workshop facilitated greatly in mobilizing and involvement of the refrigeration community. As a result, the write choice was made in the selection of location of recycling centres and potential beneficiaries among the refrigeration servicing enterprises.

382. The practical ODS recovery and recycling operations started in nine month. The adoption of the Law on Substance that Deplete the Ozone Layer in 2006 by the Government was beneficial for the control of ODS imports to the country and provided incentives for R&R operations. The distinct feature of this project design was the incorporation of the very important monitoring component for the 5-year duration of phase out activities in Armenia. This component is described in detail in the Section called Assessment of Monitoring and Evaluation System.

383. In order to make R&R operations more effective and efficient, the project design envisaged introducing a retailer licensing scheme that would have made mandatory for servicing enterprises to obtain a retailer license for purchasing CFCs from wholesalers/importers. A pre-requisite for issuing such licenses would be that at least one technician of the servicing workshop had received training in good servicing practices and recovery and recycling. It is anticipated in the Country Programme that the introduction of taxation of ODS imports and a system for licensing operators in the refrigeration servicing sector should further reinforce the efficiency of R&R activities. These legislative measures have not been materialized.

384. The R&R project has the training component while UNEP implemented its separate training project. The curricula of two training programmes contain many similar elements. The curricula of the R&R training component incorporated quite a lot of information and on-hand demonstration of good servicing practices. Both training programmes could be effectively merged bringing resulting in savings of resources. Such an approach would result in interdependency of two agencies and require more close coordination and partnership. In reality, however, the implementation of the training programme by UNEP experienced serious delays that would have put at risk the success of the R&R component.

385. The training component of the R&R project emphasized the importance of the elimination of refrigerant venting and leak prevention. The use of nitrogen for pressurizing the system during leak testing and vacuum pumps for evacuation of the system are internationally proved techniques enabling to reduce ODS emissions in servicing operations. Nitrogen cylinders were not included in the list of supplied equipment.

8.1.5.7.2 Country commitment

386. The R&R activities were included in the RMP as part of the Country Programme approved by the Government as a tool in achieving complete ODS phase out by January 2010. It was anticipated that the early introduction of R&R practices would result in sizable reduction in the demand of imported CFC refrigerants. It was understood also that once CFC imports stopped in 2010, the recycled CFC would be the only alternative source of CFC-12 refrigerant in the country for maintaining the existing refrigeration equipment. The project design was fully in line with the national plans and Government commitments to meet the Montreal Protocol targets established for Armenia.

387. The Government through the NOU provided support to the implementation of the R&R project in terms of organizing training, certification of trainees, distribution of equipment and assisting in monitoring of the progress.

388. In the Country Programme, the Government committed to reinforce the expected impact of R&R operations by the introduction of the ODS import licensing and quota system, excise taxes on imported of ozone-depleting substances and the ban on imports of ODS containing equipment in 2003-2004. The Government managed to meet their commitments only partially. The ODS import licensing and quota system was fully introduced in 2007. The rest of expected regulatory measures have not been occurred.

8.1.5.7.3 Stakeholder involvement

389. The project design stipulated the involvement of UNOPS/UNDP, Government institutions, NOU, national consultants and refrigeration servicing industry as the major stakeholders in the implementation, monitoring and evaluation of the R&R project. Additionally, it was expected that the Refrigeration Association would have been established to support the outcomes of the project, especially in continuation of the monitoring activities. In many respects, these expectations did occur. The beneficiaries of the R&R programme were outreached by the NOU through awareness campaign, involvement of the Refrigeration Association and training/demonstration workshops. The beneficiary enterprises actively participated in the monitoring activities undertaken by the national consultant providing quarterly the necessary data. The NOU and national consultant provided annually reports on quantities of recovered and recycled ODS and the operation of the R&R system to the UNDP headquarters. The final evaluation mission was expected in 2009-2010.

8.1.5.7.4 Financial planning

390. The budget for the R&R project amounted to $551,306, including $44,104 as the agency overhead costs. Additionally, the monitoring component was approved at the amount of $54,100. The budget included allocations for procurement of the R&R equipment, conducting of training/demonstration workshops, and evaluation. The procurement and delivery of equipment was implemented by UNOPS. The control of expenditures was with the UNDP Montreal Protocol Unit and UNDP GEF Unit. The funding of training/demonstration workshops and the monitoring component was organized through the UNDP local office and the NOU. There was no delay in flow of funds associated with procurement and delivery of equipment and the implementation of the training and monitoring components.

391. The evaluation of financial accounts and financial audits was not part of the Terms of References for this terminal evaluation.

8.1.5.7.5 UNEP / UNDP Supervision and backstopping

392. The implementation of the project was supervised by the UNDP Montreal Protocol Unit and the international consultant. The UNDP organized one mission of the international consultant to Armenia for conducting training/demonstration workshops. The mission and the workshop proved to be successful. The same international consultant was involved in reviewing the annual reports provided by the local monitoring consultant. The UNDP evaluation mission is expected upon the completion of the project.

8.1.5.7.6 Co-financing and Project Outcomes & Sustainability

393. There was no expected co-financing of the R&R project.

8.1.5.7.7 Delays and Project Outcomes & Sustainability

394. The 3-months administrative delay with the approval of the project and another 3-months delay in the start of R&R operations did not allow the project to make its contribution into achievement of 2005 ODS reduction target. Nonetheless, Armenia as Article 5 country met the target reporting 2005 CFC consumption of 84 ODP tonnes that was lower than the target of 98.25 ODP tonnes. The R&R activities were valuable for the achievement of 2007 85% reduction and 2010 zero CFC consumption targets. There is a good likelihood of extension of the institutional support beyond 2010 from the Multilateral Fund in connection with the accelerated phase out of HCFCs that would affect positively the sustainability of the project.

8.1.5.8 Project ratings

395. The Recovery and Recycling project is rated according to categories and criteria specified in Annex 1 of the Terms of Reference of the evaluation. The ratings are presented in Table 14.

Table 14: Ratings for the project on ODS recovery and recycling in Armenia

Criterion	Evaluator's Summary Comments	Rating
Attainment of project objectives and results (overall rating)	Most of project objectives were attained	**S**
Effectiveness	Most of project objectives were successfully attained. The Government and NOU were not fully successful in developing and adopting the legislation on introduction of excise taxes on imported ODS that was committed in the Country Programme. The R&R activities contributed to the ODS phase out in Armenia. However, this contribution was much lower because the target proved to be grossly overestimated.	**S**
Relevance	All project outcomes are fully consistent with GEF strategy in ozone focal area. The objectives of the R&R project are incorporated into the Country Programme approved by the Government.	**HS**
Efficiency	The project contributed to the achievement of 2007 and 2010 targets established for Armenia by the Montreal Protocol. The cost-effectiveness was established by UNDP using wrong assumptions. The actual cost-effectiveness of the project was poorer than established by UNDP by a factor of ten. Additional performance indicators used by the evaluator show that the efficiency of R&R system in Armenia was reasonable	**MS**
Sustainability of Project outcomes (overall rating)	The probability of continuation of R&R operations is moderately high after the project funding ended in 2009.	**S**
Financial	The growing prices for CFC-12 and HCFC-22	**S**

Criterion	Evaluator's Summary Comments	Rating
	create incentives for enhancement of refrigerant recovery activities. The owners of recovery and recycling equipment are positive about sustainability of their business.	
Socio Political	The socio-political climate is stable in the country. The Ministry of Nature Protection is prominent in the Governmental hierarchy and maintains working relationships with other stakeholders. The existing regulatory regime on imports of ODS to the country and enforcement of this regime by the Customs prevent the risk of illegal trade. The socio-political risk to the sustenance of the project is low.	**S**
Institutional framework and governance	The recovery and recycling of HCFC refrigerants is a component of the national ODS phase out strategy. The existing set up of the Ozone Office within the Governmental structure and good likelihood of continuation of financial support of the NOU from the MLF provide opportunities for the sustainability of the outcomes of the R&R project.	**S**
Environmental	The availability of CFCs in the country is diminishing because of active regulatory regime and the ongoing penetration of ODS-free equipment. The recovery and recycling of CFC-12 refrigerant will discontinue in Armenia in foreseeable future. However, the use of HCFC and HFC refrigerants is growing. The recovery and recycling equipment provided under the Project will be in use within the next decade.	**S**
Achievement of outputs and activities	The most outputs and activities have been accomplished except development and promotion of some specific legislation supporting R&R operations.	**MS**
Monitoring and Evaluation (overall rating)	M&E system achieved its objectives with minor shortcomings	**S**
M&E Design	The funding of the R&R monitoring component for five years proved to be very effective. The M&E design is lacking a number of quantitative performance indicators that would help to optimize the R&R system and enhance its efficiency. The monitoring of long-term outcomes should be taken over by the Government upon termination of the project.	**MS**

Criterion	Evaluator's Summary Comments	Rating
M&E Plan Implementation (use for adaptive management)	UNDP supervised the R&R activities through reporting provided by the national consultant. UNDP will carry out the evaluation mission upon the closure of the project. The Government is preparing to take over the implementation of M&E plan within the national programme for accelerated phase out of HCFCs.	**S**
Budgeting and Funding for M&E activities	The budget of the monitoring component amounted to $54,100 covering all the expenses of the national monitoring consultant for five years.	**S**
Catalytic Role	Economic considerations are the only factor that would stimulate servicing enterprises in purchasing R&R equipment. The cost of this equipment and subsequent economic opportunities, however, are not particularly favourable at this point of time.	No ratings are requested for the catalytic role
Preparation and readiness	The project design was replicated after numerous projects implemented by UNDP. The Government approved licensing and quota legislation. NOU identified the beneficiaries.	**S**
Country ownership /motivation	The R&R project is in the list of priority in the country programme approved by the Government. The Government provided the necessary support in the implementation.	**S**
Stakeholders involvement	The project involved all relevant stakeholders in project preparation and execution.	**S**
Financial planning	There was no delay in flow of funds associated with procurement and delivery of equipment and training. The funding of the monitoring component for 5 year duration was very beneficial.	**S**
UNEP Supervision and backstopping	In general, UNDP fulfilled well its role of the supervisory agency in many respects owing to the R&R monitoring component.	**S**
Overall Rating	The project had minor shortcomings in the achievement of its objectives	**S**

*8.1.6 ARM/04/** – Raising awareness, incentive retrofit and replacement programme in the end-user refrigeration sector*

8.1.6.1 Background

396. According to the survey of the refrigerating sector, the CFC consumption was about 12 ODP tonnes in the servicing of end-user commercial refrigeration equipment (without unitary equipment), including refrigerated fruit stores, cold rooms in the food supply chain, refrigeration

units in food and milk processing and condensing units in restaurant and retailing business.

397. UNDP developed and implemented the concept of financial incentives for retrofit/replacement of refrigeration equipment in the commercial and industrial end-user sectors as a part of the implementation of RMP in several Article 5 countries, including Armenia. In line with UNDP guidelines, commercial or industrial refrigeration those end-user enterprises are considered under the incentive payment program that have to replace, or retrofit their existing CFC-12 or R-502 based refrigeration system with a non-CFC refrigerant-based system. The funding of "drop-in" conversions using HCFC ternary refrigerant blends has not considered the best use of available GEF funds because of sustainability problems

398. The design of the system envisaged that upon receipt of an application for an incentive payment by an enterprise, 40% of the estimated cost can be paid up front if the documentation is found to be satisfactory and if the application itself is acceptable. The eligible balance is paid after: 1) the conversion to non-CFC refrigerant-based equipment has been completed; 2) the actual total cost data have been reviewed and the International Consultant made a formal recommendation on the level of the incentive payment; 3) the replaced baseline CFC refrigerant-based equipment has been destroyed/dismantled/rendered unusable. Incentive payments are to be provided according to a sliding scale from $1,500 for 3 kg ODP up to 9 kg ODP of annual CFC consumption phased-out to $15,000 for 200 kg or more of ODP consumption phased out against invoices confirming costs incurred. The balance of the cost of retrofit or replacement has to be paid by the end-user.

399. The awareness, financial incentive and retrofit project for Armenia was developed by UNDP and approved by the GEF in March 2005 at the amount of $482,369, including agency overhead costs. The project forms part of the refrigeration strategy as proposed in the RMP, together with training activities for refrigeration technicians and customs officers and the completed recovery/recycling scheme. The objective of this project is *to* encourage refrigeration end-users to replace, or permanently retrofit, their existing ODS based equipment to use zero-ODP, or low-ODP refrigerants by providing financial incentives to the enterprises in the commercial and industrial refrigeration end-user sectors and to eliminate the consumption of CFC-12 or R-502 by replacement with zero-ODP, or low-ODP refrigerants. The project targeted the phase out of 5 ODP tonnes. In the absence of the logframe matrix, the performance indicators were inferred from the outputs/deliverables contained in the UNDP project documents (Table 15).

Table 15: Awareness, financial incentive and retrofit project in Armenia: Objectives/ Intended Results - Outputs/Deliverables - Outcomes/Performance indicators

Objectives/Intended Results	Outputs/Deliverables	Outcomes/Performance indicators
1. Permanent retrofit or replacement of ODS-based refrigeration end-user equipment with HCFC or HFC-based equipment 2. Reduction in CFC demand to meet CFC phase out 2007 and 2010 targets established in the Montreal Protocol	1. Awareness campaign to outreach the end-users and disseminate information about the Programme Placement of advertisements in newspapers printing of info-leaflets about the programme and mailing to end-users Holding of a National Workshop targeting the end-users 2. Review and evaluation of the applications received from end-users. Selection of beneficiaries and determination of the amount	1. End- user ODS-based refrigeration equipment is replaced or permanently retrofitted for the use of low ODP HCFC or HFC refrigerants. • Number of replacements or permanent retrofits confirmed by documents of completion and site inspections; 2. Attainment of ODS phase out targets through replacement or permanent retrofit of end-user equipment. The reduction of demand and use of

Objectives/Intended Results	Outputs/Deliverables	Outcomes/Performance indicators
	of incentives; 3. Preparation and signing contracts between NOU and selected end-users; 4. Payment of advances; 5. NOU supervision of procurement and installation of new non-ODS equipment or retrofit performed by end-users, and recovery & recycling of the ODS refrigerant charges in the baseline equipment; 6. Preparation of the required documentation of completion and reporting results to the UNDP international consultant; 7. Review of the reports, including invoices and issue of the recommendation on the eligible level of the incentive grant by UNDP international consultant; 8. Supervision of the destruction of ODS-based equipment by the local consultant; 9. Payment of the balance of the incentive grant to an end-user; 10. Submission of the project completion report	ODS. • Data on the baseline consumption and reports on completion of replacements or permanent retrofit; • Reports on destruction or rendering unusable CFC-based equipment and site visits. 3. Reduction in maintenance and energy costs of end-users as a result of replacement due to lower refrigerant leak and higher energy efficiency of new equipment. • Statements made by owners of equipment.

400. The awareness and incentive program in Armenia was designed as two component program. The first component focused on informing the end-users in Armenia about the existence and content of the incentive programme. The second component covers grant incentives to be provided to end-users that apply for incentive payments. The awareness and incentive workshops were held in Yerevan in June 2005 and in October 2007. A special TV program was broadcasted and a booklet "*Improve your production efficacy by switching to ozone-friendly technologies!*" was prepared and published to involve more end-users into the program. The refrigeration association was actively involved in the dissemination of the information about the programme among its members.

401. In total 39 enterprises applied for grant incentives against commitments to perform the retrofit or replace their ODS-based equipment. Four enterprises failed to complete the replacement activities due to financial problems and prepared to pay back the received up-front (40%) incentive payments. Altogether, 206 units of the refrigeration equipment have been replaced and 3 units were retrofitted at 35 enterprises.

402. The initial cumulative charge of CFC-12 refrigerant in these systems was 5,570 kg. The total cost of the replacement and retrofits was assessed to be $710,268. The estimated total compensation from the project amounts to $309,662 or about 44% of the total cost. The rest is covered by end-users. The program is still on-going. So far, the sum of incentives paid to beneficiaries amounts to $240,234.

403. The evaluator visited four enterprises where the incentive program played an important role in ODS phase out and at the same time promoting the technology advancement. In interviews with owners of refrigeration equipment, they testified that the implementation of the incentive replacement and retrofit programme strictly followed the procedure established by UNDP that reflected in Column 2 Table 8 as outputs and deliverables.

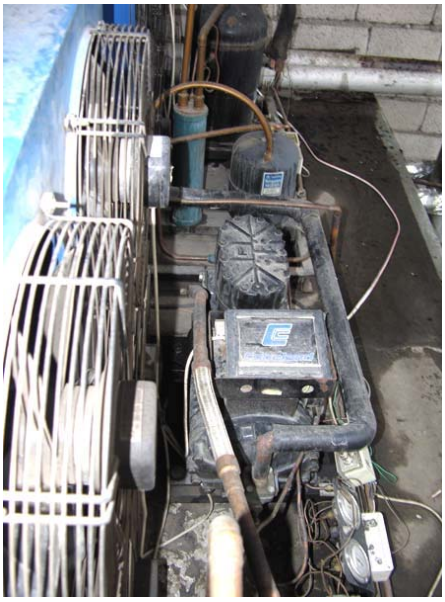


Figure 8: New Copeland R-22 condensing unit at Daroink

404. The confectionery company "Daroink" founded in 1998 in Yerevan. "Daroink" brand is among the most popular ones in Armenia offering varieties of biscuits, wafers, chocolates and cakes. "Daroink" is among the few enterprises that have been honoured with the governmental award for high quality. In 2003, "Daroink" was also awarded the International Quality Gold Star by the Board of the Business Initiative Directions in Geneva. Four CFC-12-based condensing units have been replaced with new R404 Copeland units at the cost of $34,661 (Figure 8). The documentation is under the evaluation process in the UNDP Headquarters. The compensation of $15,000 has yet to be paid.

405. *Khak Ltd* is located in Ararat Valley. Its major business is storing and selling fruits. The company completed the replacement of five CFC-12-based refrigeration units with new non-ODS equipment in August 2008. The total CFC-12 charge amounted to 79 kg. The company spent $11,000 for purchasing and installation of new equipment. The 40% advance of $2,000 was paid in March 2007. The balance of $3,000 is yet to be paid upon completion of the evaluation of invoices.

406. "Linda Ltd" is a leading meat processing enterprise in Armenia. The company was established in 1995. The company is developing its retailing network. The products of "Linda Ltd" were awarded with several diplomas and have been exported to Ukraine, Russia and Georgia. "Linda Ltd" was one of the first beneficiaries of the programme. The replacement of nine CFC-12 units was completed in June 2007 (Figure 9). The full compensation of $10,000 was paid in August 2007. In total, 209 kg of CFC-12 was phased out.

Figure 9: New Danfoss R-404 compressor at Linda Ltd.

407. *"Vostan Ltd"*, the restaurant and food processing enterprise completed the replacement of six CFC-based refrigeration units within 5 months resulting in the phase-out of 80 kg of CFC-12. The full compensation was paid in November 2006.

408. The management of visited companies expressed its satisfaction in regard to the objectives and implementation modalities of the program. The replacement equipment is mainly based on R404A and HCFC-22 with only a few based on R407C. The new HCFC-22-based equipment is still available and popular because of advantages in price of the refrigerant ($5.00/kg for HCFC-22 vs $16.00/kg for R404A). The major driving force for the replacement of CFC-12 based equipment was the future unavailability of the refrigerant. There

are additional benefits associated with replacements such as lower cost of energy and maintenance. The new equipment is virtually leak proof and do not require a permanent supervision by servicing personnel. The program facilitated the propagation of information on new technology. Completed conversions demonstrated new technological solutions to the refrigeration community providing a catalyzing and cascading impact, which indirectly also contributed to the achievement of 2005 and 2007 control targets.

409. The direct CFC phase-out in completed end-user conversions of about 5.5 ODP tonnes represented a tangible direct contribution to the overall reduction in CFC consumption in the country slightly exceeding the established target. The incentive program was well designed and implemented under the supervision of international and national consultants.

8.1.6.1.1 Relevance

410. The outcomes of the financial incentive and retrofit programme are fully in agreement with the strategy and priorities outlined in the country programme and with the G EF ozone focal area. The recovery and recycling operations contributed to the reduction of ODS emissions into the atmosphere. Since most CFC refrigerants are also greenhouse gases, the reduction in ODS emissions was also a factor in reducing the threat of the global warming, bringing substantial benefits to the climate.

8.1.6.1.2 Efficiency

411. The ODS phase out target of the incentive and retrofit programme was established in the UNDP project document at 5.0 ODP tonnes. The cost-effectiveness was erroneously calculated as $8.9/kg ODP. The correct value should be $89.3/kg ODP.

412. The programme is still ongoing. Out of $392,736 allocated for incentives, the amount of $309,662 has been committed under the signed contracts. The amount of $69,428 was committed but yet paid. The baseline charge of CFC-12 was 5,570 ODP kg in the equipment covered by the signed contracts. Currently, the cost-effectiveness can be calculated at $55.6 kg ODP using the value of committed resources and the charge of the system as an estimated annual ODS consumption[55]. The overall cost-effectiveness of the project is $80.2/kg ODP if the total funding is used in the calculation i.e $446,638. Effectively, the performance of the programme exceeded the targets established in the project document. However, the overall cost-effectiveness is less favourable than those registered in majority of other incentive projects implemented by UNDP in more than 20 Article 5 countries[56]. The final results will be available in the UNDP project evaluation report upon completion of the project.

8.1.6.2 Assessment of Sustainability of project outcomes

8.1.6.2.1 Financial resources

413. The resources allocated by the GEF proved to be sufficient to meet the established ODS phase out targets. All the components have funded as planned. The end-users have met fully their obligations and provided committed resources. The companies have invested about $400,000 in counterpart funding to either improve or expand their facilities and it is in their interests to safeguard this investment using CFC alternatives. The balance of the GEF funding of about $83,000 is still available and will be utilized within 2009-2010. There is no financial risk that may jeopardize sustenance of project outcomes.

8.1.6.2.2 Socio-political

414. The socio-political climate is favourable for maintaining sustainability of project outcomes. The Ministry of Nature Protection is prominent in the Governmental hierarchy and maintains working relationships with other stakeholders. The Government policies created uncertainty with availability of CFC refrigerant in Armenia that was one of the drivers for end-users to join the incentive and retrofit programme. The existing regulatory regime on imports of ODS to the country and enforcement of this regime by the Customs prevent the risk of CFC illegal trade that

---

[55] It should be noted that the estimated annual consumption of CFC-12 may differ from the initial charge sometimes significantly depending on the refrigerant leakage rate that is determined by the system design, age, maintenance practices and others.

[56] The 52nd Meeting of the Executive Committee of the Multilateral Fund; EXTENDED DESK STUDY ON INCENTIVE PROGRAMMES FOR RETROFITS; UNEP/OzL.Pro/ExCom/52/825 June 2007

could a negative effect for the replication of replacements by other end-users not involved in the project. The stakeholders clearly support the programme. The socio-political risk to the sustenance of the project is low

8.1.6.2.3 Institutional framework and governance

415. The existing set up of the Ozone Office within the Governmental structure and good likelihood of continuation of financial support of the NOU from the MLF provide opportunities for further strengthening of legal framework and policies in regard to ODS phase out that will be beneficial for the sustainability of the outcomes of the incentive and retrofit programme.

8.1.6.2.4 Environmental

416. The production of CFCs was stopped globally. The enforcement of the licensing and ODS import quota system, and steadily increasing prices of CFC-12 are the driving force to diminish the supply and demand of CFC refrigerants. The demand in CFC refrigerant is diminishing also because of the replacement of CFC-based equipment with ODS-free equipment, over and above the replacements under the Programme. Documented evidence is available showing that measures have been taken to destroy/render unusable the CFC-based equipment. All these circumstances help to sustain the conversions.

417. However, some of end-users have been replacing its equipment using HCFC- rather than HFC-based units primarily due to lower cost of the refrigerant. The Government is committed to support decisions of the Parties to the Montreal Protocol in regard to the accelerated phase out of HCFCs. The Government is closely cooperating with UNDP on the development of the national strategy on this matter. Therefore, the newly installed HCFC-based equipment is not the final solution for end-users concerned. The sustainability of several replacements funded by the Project is uncertain.

8.1.6.3 Catalytic role

418. The project has a certain replication effect. Completed conversions demonstrated new technological solutions to the refrigeration community providing a catalyzing and cascading impact. The Refrigeration Association plays its positive role in the dissemination of information regarding new more efficient equipment installed through the incentive programme.

8.1.6.4 Achievement of outputs and activities

419. All the activities listed in Column 2 (Outputs/Deliverables) Table 8 are part of the standard procedure developed by UNDP for the implementation of the Programme. The activities from 1 to 9 as listed in of Table 8 were achieved. The submission of the project completion report is pending.

8.1.6.5 Assessment of Monitoring and Evaluation Systems

8.1.6.5.1 M&E design

420. The implementation modality of the Programme stipulated the direct involvement of the national consultant recruited for carrying out the required activities. The international consultant was designated by UNDP for regular reviewing the documentation and reports of the national consultant and supervising his performance. The international consultant made final recommendations on up-front and final payments to end-users involved. The local UNDP office operated as a financing entity and acted according to recommendations from the UNDP international consultant. The local UNDP office performed also verification of contracts and invoices submitted by end-users. The NOU was also closely involved in the interactions with the local and international consultants and the UNDP office.

421. The international consultant used criteria and performance indicators developed by UNDP in the detailed procedures related to the selection of technology for replacements and retrofits, determinations of eligibility and the amount of the compensation, as well as other technical and safety issues.

8.1.6.5.2 M&E plan implementation

422. The information concerning the objectives, implementation modalities and the M&E plan of the

programme have been disseminated among the refrigeration community and end-users and further explained by the international consultant at the workshop organized in Yerevan with the participation of the NOU, potential beneficiaries and representatives from the local UNDP office and the Refrigeration Association (RA). The Chairman of the RA was designated as a national consultant responsible for the implementation of the Programme.

423. The local consultant and the NOU were successful in meeting all the requirements for monitoring and reporting. The local UNDP office provided valuable assistance in verifying invoices and other financial documentation provided by end-users. Only four enterprises out of 39 involved failed to complete the replacement activities due to financial problems. But these enterprises are prepared to pay back the received up-front (40%) incentive payments. No financial losses have been reported so far.

424. The final evaluation report will be prepared by UNDP upon completion of the project.

8.1.6.5.3 Budgeting and funding for M&E activities

425. The budget has provisions of $18,000 for services of the international consultant and $25,000 for services of the national consultant, including local travel and sundries. The above resources have been made available in a timely fashion.

8.1.6.5.4 Long-term Monitoring

426. There are no provisions for the long term monitoring of the results of the programme. However, the preparation of HCFC Phase out Management Plan is under way in Armenia that would require updated information in the end-user refrigeration sector.

8.1.6.6 Assessment of processes that affected attainment of project results

8.1.6.6.1 Preparation and readiness

427. UNDP took the initiative and responsibility in developing the concept of incentive programmes addressing CFC consumption in the refrigeration servicing sector in Article 5 countries. The Executive Committee of the Multilateral Fund considered this concept and approved guidelines for preparation of projects. UNDP implemented incentive projects in 20 Article 5 countries. The Executive Committee recognized these projects as one of the priorities jointly with other phase-out activities such as training of refrigeration technicians and providing basic tools and recovery and recycling equipment where still needed. The retrofit or replacement of CFC-based equipment brings sustainable conversions. Incentive programmes are also capable to bring additional benefits by stimulating non-funded units to convert on their own, re-using recovered refrigerant as well as enabling lower operating costs, better performance and life time extension of converted equipment.

428. The experience gained by UNDP in other Article 5 countries facilitated UNDP to incorporate lessons learned into the design of the incentive programme in Armenia. UNDP together with the NOU identified the stakeholders and made proper partnership arrangements that produced good results. The implementation modalities outlined in the project document have been closely followed. The NOU, international and local consultant demonstrated flexible approach and managed to address the needs and concerns of a variety of end-users.

8.1.6.6.2 Country ownership/commitment;

429. The financial incentive and retrofit programme was included in the RMP as part of the Country Programme approved by the Government as a tool in achieving complete ODS phase out by January 2010. It was anticipated that the implementation of the Programme would result in involvement of the important end-user sector and reduction in the demand of imported CFC refrigerants. It was understood also that retrofit or replacement of CFC-based equipment brings sustainable conversions and additional replication effect by stimulating non-funded units to convert on their own. The project design was fully in line with the national plans and Government commitments to meet the Montreal Protocol targets established for Armenia.

430. A well positioned and effectively functioning NOU has to be in place in order to provide the effective management and monitoring of the implementation modality for incentives for retrofits developed by UNDP. The Government through the NOU and the Refrigeration Association

provided valuable support to the implementation of the Programme in outreaching the end-users and in monitoring of the progress.

431. The ODS import licensing and quota system was fully introduced in 2007 stimulating end-users to participate in the incentive and retrofit programme. In the Country Programme, the Government committed to introduce excise taxes on imported ozone-depleting substances and the ban on imports of ODS containing equipment in 2003-2004 that would promote the Programme even further. Unfortunately, these regulatory measures have not been implemented.

8.1.6.6.3 Stakeholder involvement

432. The full involvement of UNDP and his international consultant, NOU, the national consultant and end-users of refrigeration equipment as the major stakeholders was an important factor for the successful implementation and monitoring of the incentive and retrofit programme. Additionally, the Refrigeration Association proved to be very effective in helping to outreach the potential beneficiaries. The beneficiary enterprises played the pivotal role in the implementation of the Programme contributing financially to the procurement and installation of new equipment and assisting to the national consultant in the monitoring activities providing the required information in a timely fashion. The local UNDP office was fully involved providing financial services.

8.1.6.6.4 Financial planning

433. In line with UNDP guidelines, upon receipt of an application for an incentive payment by an enterprise, 40% of the estimated cost can be paid up front if the documentation is found to be satisfactory and if the application itself is acceptable. The eligible balance will be paid after: (a) the conversion to non-CFC refrigerant-based equipment has been completed; (b) the actual total cost data have been reviewed and the International Consultant has made a formal recommendation on the level of the incentive payment; (c) the replaced baseline CFC refrigerant-based equipment has been destroyed/dismantled/rendered unusable.

434. The UNDP local office checked the invoices and other financial documentation provided by beneficiaries. The UNDP requirements have been fully met and that allowed for proper and timely flow of funds. The total cost of the replacement and retrofits was assessed to be $710,268. The estimated total compensation amounts to $309,662 or about 44% of the total cost. The co-financing of owners of refrigeration equipment amounted to about $400,000. The program is still on-going. So far, the sum of incentives paid to beneficiaries amounts to $240,234.

8.1.6.6.5 UNDP Supervision and backstopping

435. The international consultant was designated by UNDP to travel to Armenia for the awareness workshop and subsequently for regular reviewing the documentation and reports of the national consultant and supervising his performance by correspondence. The international consultant made final recommendations on up-front and final payments to end-users involved. The local UNDP office operated as a financing entity and acted according to recommendations from the UNDP international consultant. The local UNDP office performed also verification of contracts and invoices submitted by end-users. The level of supervision by UNDP proved to be positive and sufficient.

8.1.6.6.6 Co-financing and Project Outcomes & Sustainability

436. The sufficient co-financing from end-users is a principal condition for the success of the incentive and retrofit programme. The beneficiaries managed to maintain their obligations to the expected level and provided contribution amounting to about $400,000. The final value of co-financing will be known upon completion of the project. The matched co-financing ensures the sustainability of outcomes of the project

8.1.6.6.7 Delays and Project Outcomes & Sustainability

437. The duration of the project is six years. There were no delays in the implementation of the project. The completion of the project is anticipated in 2010.

8.1.6.7 Project ratings

438. The ratings of the training project is rated according to categories and criteria specified in Annex 1 of the Terms of Reference of the evaluation. The ratings are presented in Table 16.

Table 16: Ratings for financial incentive and retrofit project in Armenia

Criterion	Evaluator's Summary Comments	Rating
Attainment of project objectives and results (overall rating)	The project had minor shortcomings in the achievement of it objectives and results.	**S**
Effectiveness	The program is still on-going. The project resulted in phase out of 5.57 ODP tonnes through replacement and retrofitting thus contributing to meeting 2007 and 2010 MP benchmarks. The result exceeded the project target. The project yielded additional benefits such as lower cost of energy and maintenance. End-users invested about $400,000 of their resources.	**HS**
Relevance	All project outcomes are fully consistent with national priorities and GEF strategy in ozone and climate focal areas.	**HS**
Efficiency	The national demand for CFCs has been reduced by 5.57 ODP tonnes as result of the project against targeted 5.0 ODP tonnes. Currently, the cost-effectiveness is more favourable than a target. However, the overall cost-effectiveness is less favourable than those registered in majority of other incentive projects implemented by UNDP in more than 20 Article 5 countries.	**S**
Sustainability of Project outcomes (overall rating)	The socio-political and financial risks for sustainability are low. The sustainability of several replacements funded by the Project is uncertain because of some end-users selected HCFC-based equipment.	**ML**
Financial	The resources allocated by the GEF proved to be sufficient to meet the established ODS phase out targets. There is no financial risk that may jeopardize sustenance of project outcomes	**L**
Socio Political	The socio-political climate is favourable for maintaining sustainability of project outcomes. The Government policies created uncertainty with availability of CFC refrigerant in Armenia that was one of the drivers for end-users to join the incentive and retrofit programme. The stakeholders clearly support the programme. The socio-political risk to the sustenance of the	**L**

Criterion	Evaluator's Summary Comments	Rating
	project is low.	
Institutional framework and governance	The existing set up of the NOU within the Governmental structure and good likelihood of continuation of financial support of the NOU from the MLF provide opportunities for further strengthening of legal framework and policies in regard to ODS phase out that will be beneficial for the sustainability of the outcomes of the incentive and retrofit programme.	**L**
Environmental	The demand for and availability of CFCs in the country are diminishing. Some of end-users have been replacing its equipment using HCFC- rather than HFC-based units primarily due to lower cost of the refrigerant. The sustainability of several replacements funded by the Project is uncertain.	**ML**
Achievement of outputs and activities	The project is still ongoing. All the major planned outputs and activities have been accomplished. The submission of the project completion report is pending.	**S**
Monitoring and Evaluation (overall rating)	The monitoring and evaluation system is well designed. The M&E plan has been successfully implemented. The final evaluation report will be prepared by UNDP upon completion of the project.	**S**
M&E Design	The M&E modalities are very well articulated in the project design. The implementation of the M&E plan relies upon good cooperation between the UNDP designated consultant and the NOU, the local consultant and the local UNDP office.	**S**
M&E Plan Implementation (use for adaptive management)	The local consultant and the NOU were successful in meeting all the requirements for monitoring and reporting. The final evaluation report will be prepared by UNDP upon completion of the project.	**S**
Budgeting and Funding for M&E activities	The budget had sufficient allocations for the implementation of the M&E plan.	**S**
Catalytic Role	Completed conversions demonstrated new technological solutions to the refrigeration community providing a catalyzing and cascading impact.	No ratings are requested for the catalytic role.
Preparation and readiness	The experience gained by UNDP in the implementation of incentive programmes in other Article 5 countries facilitated UNDP to incorporate lessons learned into	**S**

Criterion	Evaluator's Summary Comments	Rating
	the design of the project for Armenia. UNDP together with the NOU identified the stakeholders and made proper partnership arrangements that produced good results.	
Country ownership / commitments	The Government through the NOU and the Refrigeration Association provided valuable support to the implementation of the Programme in adopting the legislation, outreaching the end-users and monitoring of the progress. Some of legislation committed In the Country Programme have not occurred.	**MS**
Stakeholders involvement	Al the relevant stakeholders have been fully involved that was the important factor for the successful implementation and monitoring of the programme.	**S**
Financial planning	The UNDP financial planning requirements have been fully met by stakeholders that allowed for proper and timely flow of funds. The co-financing from owners of refrigeration equipment amounted to about $400,000. The program is still on-going.	**S**
UNDP Supervision and backstopping	The UNDP international consultant together with the local UNDP office provided comprehensive supervision and backstopping.	**S**
Overall Rating		**S**

*8.1.7 ARM/04/*** - Phase-out of CFCs in manufacture of commercial refrigeration equipment at Saga*

8.1.7.1 Background

439. SAGA Ltd was the only refrigeration manufacturing facility in Armenia at the time of formulation the ODS phase out programme in Armenia. SAGA Ltd was founded in 1995 as a refrigeration equipment trading company. Later the company expanded its activities into manufacturing of commercial refrigeration equipment. At the time of the project formulation in 2001, the company manufactured display cases, chest freezers, bottle coolers and visi-coolers with production of 6,000 units per year. CFC-11 was used as the polyurethane (PU) foam blown agent and CFC-12 as the refrigerant. The GEF grant of $170,716 was utilized to phase out the total annual consumption of 6.5 ODP tonnes. The project was completed on 20 January 2006.

8.1.7.2 Attainment of objectives and planned results

8.1.7.2.1 Objectives, outputs, outcomes and performance indicators

440. The conversion of SAGA was included in the Country Programme approved by the Government. The objectives of the project were to phase out the use of CFC-12 and CFC-11 in the manufacture of commercial refrigeration equipment at SAGA applying non-ODS technologies. The outputs and planned activities are contained in the project implementation schedule. In the absence of the logframe for the evaluation of the Project, outcomes and performance indicators were inferred

from the outputs/deliverables contained in the UNDP project document (Table 17).

Table 17: Phase out of CFCs in manufacturing of domestic refrigerators at SAGA: Objectives/ Intended Results - Outputs/Deliverables - Outcomes/Performance indicators

Objectives/Intended Results	Outputs/Deliverables	Outcomes/Performance indicators
1.The elimination of the use of CFCs in the manufacture of commercial refrigeration equipment at SAGA assisting the Government to meet the Montreal Protocol CFC phase out targets 2.The establishment of ODS-free manufacturing capacity in Armenia reducing the future demand for CFC-12 in the servicing sector	1. Conversion of the manufacturing process at SAGA from the use of CFC-11 to water-blown PU foam and CFC-12 to HFC-134a refrigerant respectively. • Deliverables: • Procurement of new production equipment; • Delivery of new production equipment to the country; • Installation of new production equipment;; • Start up; • Training of personnel; • Re-design, prototyping, testing; • Pilot scale production of new product; • Test trials; • Certification;	1. The phase out of 6.5 ODP tonnes in manufacturing of commercial refrigeration equipment facilitating compliance with the Montreal Protocol benchmarks • The ODS-free production equipment is installed and commissioned; • The personnel is trained; • The manufacturing of ODS-free product is started; 2. Irreversibility of conversion • CFC-based production equipment is destroyed or rendered unusable; • The ban on imports of CFC-based equipment is introduced; 3. The stable production of commercial refrigeration equipment is maintained based on alternative ODS – free technologies avoiding the economic and social disruption after the conversion and reducing demand for CFC-12 refrigerant for servicing • Stable production of non-ODS product; • The new product is competitive on the local market; • The output after the conversion is comparable or higher than the production before conversion.

8.1.7.2.2 Effectiveness

441. In 2001, SAGA manufactured 6,000 units of refrigerated display cabinets, chest freezers, bottle

coolers and visi-coolers. The CFC consumption was calculated to be 6.58 ODP tonnes, including 2.0 ODP tonnes of CFC-11, 4.5 ODP tonnes of CFC-12 and 0.08 ODP tonnes of R-502. The company used CFC-11 as a blowing agent in the production of rigid polyurethane insulation panels and CFC-12 as refrigerant. By the time of project formulation, the HFC 134a refrigerant was universally accepted as a replacement for CFC 12 in the manufacture of domestic refrigerators and freezers. HFC 134a was widely available and the technology was mature, having already been introduced commercially in many developed countries. Replacement of CFC 12 with HFC 134a required relatively modest changes to existing production facilities involving the use of specific compressors and the associated new synthetic lubricants, re-design of the refrigeration systems to cater for the difference in thermodynamic performance of HFC 134a versus CFC 12, prototyping, testing and optimisation of each refrigerator model. The different properties of HFC 134a and the need to avoid cross-contamination with CFC 12 required installation of new system evacuation, refrigerant charging, and leak detection equipment.

442. Several alternative non-ODS technologies have been reviewed for foam blowing. HFC-245 and HFC-356 blowing agents did not meet the requirements on maturity and availability at the time of the project formulation. HCFC-141b-based technology was the least expensive but it did not comply with the GEF strategic guidelines because of its transitional nature and was rejected. HFC-134a was difficult to handle and expensive. Pentane met the selection criteria and was a preferred solution but was not feasible because this technology could not be safely incorporated into existing workplace environment. Therefore, SAGA has chosen a zero-ODP technology employing only carbon dioxide blowing agent generated from water/isocyanate reaction (Figure 10).

443. The GEF technical reviewer noted in his review that water/carbon dioxide foam blowing technology would not ensure the optimum insulation properties. UNDP consultant clarified that the enterprise was aware that water-based technology was not the best in terms of foam insulation value. The consultant clarified further that the optimum insulation value was not critical for SAGA' product since thicker insulation can be used in critical areas/product. The use of the high-pressure dispenser, giving more homogeneous foam, was likely to compensate for much reduction in insulation value. The company signed the Letter of Commitment accepting the project as proposed in the project document and promising the use of only zero-ODS technologies.

444. It should be noted that TEAP did not include the water/carbon dioxide as a technology of choice for the application in the refrigeration industry because of poor insulation value and existing energy efficiency standards. Basic performance requirements for commercial refrigerators and freezers have determined as for domestic refrigerators. The application area was limited to cases where the comparatively poor thermal insulation properties of the foam can be compensated by increased thickness in some cases such as production of water heaters.[57]

Figure 10: Cannon 80 foam dispenser at SAGA Ltd.

445. The new production equipment has been provided by UNDP and UNOPS delivered by UNOPS and installed at the plant site with assistance from the international consultant. New equipment allowed SAGA Ltd. to adapt the water-based PU foam formulation in manufacturing insulation panels. The high capacity 80 kg Cannon foam dispenser replaced manual foam mixing and pouring operations. New HFC-134a-based refrigerant charging equipment, new vacuum pumps and leak detectors provided for assembly line enhanced the production capability of the company. The company on their own purchased and installed a new 6-meter hydraulic press in new production facility that enabled the company manufacturing high quality insulation sandwich panels. In couple with the Cannon dispenser, this equipment helped to increase significantly both productivity and quality of SAGA' foam manufacturing operations.

[57] 2002 Report of the Rigid and Flexible Foams Technical Options Committee

446. All the necessary production equipment have been procured, delivered by UNOPS and installed at the plant site with assistance from the international consultant. The enterprise did not have any formal technology transfer agreements. The necessary technical assistance was obtained from their equipment suppliers and through UNDP technical support. The conversion was associated with changes in manufacturing processes and procedures introducing technology that required training of production line supervisors and operators. The pilot scale manufacture and testing were undertaken by the enterprise. The personnel involved in production have been trained.

447. The execution of the project was proceeding ahead of schedule. The conversion was completed and production of ODS-free product started in January 2006. The representative of UNDP/UNOPS and the management of SAGA signed the Certificate of Completion of the project and Declaration of Disposal of CFC baseline equipment. All the CFC- based production equipment was destroyed or rendered unusable. Through the conversion of SAGA ltd., the national ODS consumption was reduced by 6.5 ODP tonnes. The project contributed to the CFC phase out in the country and attainment of the Montreal Protocol targets. Presently, the company is one of the most important manufacturers of commercial refrigeration equipment in the Caucasus region producing about 3,000 units in 2007 reducing demand for CFC refrigerant in the servicing sector. The company has a good marketing strategy and exported its product to Georgia, Kazakhstan and Russia. The management of the company is planning new investments for the further expansion of the production. In overall, the project is a success story.

448. SAGA is using the foam system based on "BaySystems Pearl" Baymer DPU-40-1 polyol component in production of their thermal insulation panels. The polyol ingredient is manufactured and supplied to Armenia by the Bayer plant located in United Arab Emirates. The system is still using HCFC-141b as co-blowing agent. SAGA explained that water base blowing system did not meet their requirements and was abandoned. It is known that "BaySystems Pearl" have been prepared to offer more environmentally responsible options for eliminating HCFC-141b and give customers individual advice on selecting the best solution to meet their needs. Non-ODS foam systems are also available from other suppliers.

449. It was planned to adopt legislation banning the import of CFC-based refrigeration equipment in order to create more favourable conditions for SAGA products at the local market and reduce the demand for CFC refrigerants in the servicing sector. Until now, the legislation was not prepared and adopted by the Government.

8.1.7.2.3 Relevance

450. The project outcome related to CFC phase out is consistent with the Government strategy and priorities. The use of HCFC-based system is not consistent with GEF strategic guidelines.

8.1.7.2.4 Efficiency

451. The project was approved in March 2005. The completion of the project was planned within 33 months in December 2007. The project was implemented by UNDP/UNOPS and was completed ahead of schedule in January 2006. The early conversion of SAGA enabled the project to contribute to meeting 2007 85% reduction target by Armenia.

452. The cost-effectiveness of GEF grant was calculated at $24.32/kg ODP on the basis of 2001 production of 6,000 units and total consumption of 6.5 ODP tonnes. CFC-12 consumption was calculated using an average refrigerant charge of 0.75 kg. CFC-11 consumption was calculated on the basis of the total weight of PU foam consumed and 15% content of CFC-11 in the foam formulation.

453. The production of CFC-free units by SAGA in 2007 was 3000 units. The HCFC-141 content in BaySystems Pearl foam component is not known. Therefore, it is not possible to determine accurately the residual ODP consumption by SAGA in its foam blowing operations and to calculate the actual cost-effectiveness of the project. The residual HCFC-141 consumption can be roughly estimated on the basis of the current annual production of 3,000 units that represents 50% of production in 2000 and ODP of HCFC-141b if content of HCFC-141b is the same 15% of the foam formulation by weight as CFC-11. The residual consumption would be 110 kg ODP annually.

8.1.7.3 Assessment of Sustainability of project outcomes

8.1.7.3.1 Financial resources

454. The financial resources provided by GEF covered fully the cost of conversion of the insulation foam and refrigerant related operations. The company absorbed the increase in annual operating costs of $47,350 since these costs were not recognized eligible according to GEF guidelines. The expansion and upgrading of SAGA production in recent years indicate to the stable financial situation of the company that ensures the sustainability of the outcomes of the project.

8.1.7.3.2 Socio-political

455. The conversion of SAGA was a priority project for the Government. The Government was not successful in adoption of legislation banning imports of ODS containing equipment and products that would have strengthen further the position of the company on the local market. The expansion and upgrading the production was beneficial for the workforce and resulted in growth of jobs.

8.1.7.3.3 Institutional framework and governance

456. The Government and NOU provided the necessary support to the management of the enterprise during the implementation of the conversion. The NOU was actively interacting with the State Customs Committee to ensure the timely clearance of imported production equipment.

8.1.7.3.4 Environmental

457. The elimination of use of CFC-12 and CFC-11 in SAGA manufacturing process proved to be irreversible. SAGA is the only manufacturer of commercial refrigeration equipment in the country and hence the conversion had a sizable impact on the local market of refrigeration equipment. Currently, the remaining challenge is to switch from HCFC-based foam system to more environmentally responsible options.

8.1.7.4 Catalytic role

458. SAGA is the only manufacturer of commercial refrigeration equipment in Armenia. Therefore, no replication of SAGA conversion was observed in the country. The catalytic effect of the project is associated with penetration of CFC-free SAGA product on the local market that replaced the CFC-based equipment and resulted in the reduction in demand for CFC refrigerant in the servicing sector.

8.1.7.5 Achievement of outputs and activities

459. The outputs related to the project execution (procurement, delivery and installation of new production equipment, re-design, start up, training, pilot scale production of new product, test trials and mass production have been delivered ahead of project schedule. The Section on Effectiveness provides detailed account of their quantity, quality and usefulness.

8.1.7.6 Assessment of Monitoring and Evaluation Systems

8.1.7.6.1 M&E design

460. The project document contains the schedule reflecting the timing of all major tasks and the table with milestones of for project monitoring. The project design envisaged the monitoring of the implementation by backstopping officers in UNOPS and UNDP Montreal Protocol Unit. The international consultant was assigned to develop the conversion plan that was agreed with the management of the enterprise. The implementation of the plan was supervised by the same international consultant in cooperation with the NOU and the UNDP local office. The project envisaged also a mission of a UNOPS consultant to make the final evaluation and sign the Certificate of Completion, including the Declaration of Disposal of CFC baseline equipment.

8.1.7.6.2 M&E plan implementation

461. According to the project implementation schedule the mass production with CFC-free foam insulation was planned in 27 months since the approval of the project. The mass production with HFC-134 refrigerant was scheduled in 30 months after the approval. The Certificate of Completion was not made available to the evaluator. According to the NOU website the project

was completed in January 2006 with 12 months ahead of schedule.

462. The UNOPS international consultant supervised the implementation and visited the project site at key points in time providing the necessary expertise in planning, installation of production equipment, testing and prototyping, and evaluation of results and certification of the completion of conversion. The tri-partite protocol on the completion of the project was signed by representatives of the Government, the NOU and the local UNDP office.

8.1.7.6.3 Budgeting and Funding for M&E activities

463. The budget of the project provided sufficient resources for monitoring, evaluation and supervision activities through the following allocations: Technology Transfer/Technical Advisory Services - $20,000; Executing Agency Fee - $12, 646; Evaluation Mission - $5,000. All these resources were readily available.

8.1.7.6.4 Long-term Monitoring

464. The long term monitoring was not envisaged in the project. The responsibilities of executing agencies came to an end upon signing the certificate of completion. The NOU continued monitoring of ODS consumption by SAGA as part of its Article 7 reporting responsibilities.

465. Assessment of processes that affected attainment of project results

8.1.7.6.5 Preparation and readiness

466. UNDP had a substantial experience in conversion of commercial refrigeration manufacturing facilities in Article 5 countries as an implementing agency under the Multilateral Fund. The project design in many respect replicated the pattern of many approved projects under the MLF. The implementation mechanism relied upon the experience of UNOPS as an executing agency that was earlier involved in the implementation of similar projects in cooperation with UNDP. The project management and supervision followed established UNDP and UNOPS guidelines. The project was implemented ahead of established time schedule.

467. It should be noted that HCFC-141b foam systems have been selected by UNDP in majority of conversions of commercial refrigeration manufacturing facilities in Article 5 countries in cases when safety concerns prevented the use of cyclopentane-based technology. The GEF policies, however, did not allow for the choice of HCFC technology.

8.1.7.6.6 Country commitment

468. The Government considered SAGA conversion as a priority project and provided its support by facilitating the customs clearance and waving taxes on imported production equipment. The NOU provided all the necessary organizational support to the international consultant and the management of the enterprise during the implementation of the project.

8.1.7.6.7 Stakeholder involvement

469. The project involved directly the management of the enterprise at each step of its implementation as well as the NOU, the Government entities, UNOPS international consultant, UNDP Headquarters and its local office in Yerevan.

8.1.7.6.8 Financial planning

470. The budget covered all the necessary equipment and activities associated with conversion of the refrigerant and insulation foam production lines to replace CFC-12 and CFC-11 with HFC-134a and cyclopentane alternatives respectively. The planning and management of the project ensured the proper flow of funds. The conversion was accomplished ahead of the established timetable.

471. The enterprise did not claim incremental operating cost of $82,384 that was calculated as net present value for two years duration. This amount was presented as in-kind IOC co-financing by the company. The company also co-financed the procurement of the high pressure foam dispenser in the amount of $24,000.

472. The evaluators had no access to financial documentation to verify the breakdown of final actual project costs.

8.1.7.6.9 UNEP / UNDP Supervision and backstopping

473. The role of UNDP and UNOPS in supervising and backstopping of the project is described in the relevant Section above.

8.1.7.6.10 Co-financing and Project Outcomes & Sustainability

474. The enterprise is economically viable and planning to invest in the expansion of its production. The company absorbed incremental operating cost of the conversion and claimed these costs as in-kind co-financing of the project. There is no risk to the sustainability and outcomes of the project.

8.1.7.6.11 Delays and Project Outcomes & Sustainability

475. There was no delay in the implementation of the project.

476. The ratings for the domestic refrigerator production project at Saga in Armenia are show in Table 18.

Table 18: Ratings for the domestic refrigerator production project at Saga in Armenia

Criterion	Evaluator's Summary Comments	Rating
Attainment of project objectives and results (overall rating)	The project has minor shortcomings in the achievement of its objectives associated with the change of technology after the conversion	**MS**
Effectiveness	The conversion was completed with 12 months ahead of schedule. The project contributed to the CFC phase out in the country and attainment of the Montreal Protocol targets as planned. The enterprise is in a good shape and planning to invest in the further expansion of production. The foam blowing technology selected by UNDP proved to be inadequate. After the completion of the project, the company changed zero-ODP foam technology to HCFC-141b co-blowing system. The Government was not successful in adopting the ban on imports of CFC-based refrigeration equipment in order to create more favourable conditions for SAGA product at the local market and further reduce the demand for CFC refrigerants in the servicing sector.	**MS**
Relevance	The SAGA conversion is incorporated into the Country Programme as a priority. The use of HCFC-141b as foam co-blowing agent is not consistent with GEF strategic guidelines in the ozone focal area.	**MS**

Criterion	Evaluator's Summary Comments	Rating
Efficiency	The early conversion of SAGA enabled the project to contribute to meeting 85% CFC reduction target by Armenia in 2007. The cost-effectiveness of GEF grant was calculated at $24.32/kg ODP. The actual cost-effectiveness is slightly inferior because of residual ODP of about 1.5% due to the HCFC-141b co-blowing foam.	**MS**
Sustainability of Project outcomes (overall rating)	Conversion to ODS-free technology was not irreversible. The company is still using HCFC co-blowing agent albeit in small quantities. Project outcomes cannot be recognized as sustainable.	**MS**
Financial	The financial resources provided by GEF covered fully the cost of conversion of the insulation foam and refrigerant related operations. The expansion and upgrading of SAGA production in recent years indicate to the stable financial situation of the company that ensures the sustainability of the outcomes of the project.	**S**
Socio Political	The conversion of SAGA was a priority project for the Government. The expansion and upgrading the production was beneficial for the workforce and brought more jobs. The Government was not successful in adoption of legislation banning imports of ODS containing equipment products that would have strengthen further the position of the company on the local market.	**MS**
Institutional framework and governance	The Government and NOU provided the necessary support to the management of the enterprise during the implementation of the conversion. The NOU could not ensure the fulfilment of the enterprise commitments to use ODS-free technology.	**MS**
Environmental	The elimination of use of CFC-12 and CFC-11 in SAGA manufacturing process proved to be irreversible. The conversion had a sizable positive impact on the local market of refrigeration equipment. There is about 100 kg ODP of the residual use due to HCFC-based foam system.	**MS**
Achievement of outputs and activities	The outputs related to the project execution have been delivered ahead of schedule.	**S**
Monitoring and Evaluation (overall rating)	The M&E activities were implemented in a satisfactory way.	**S**
M&E Design	The project design envisaged the monitoring of the implementation by backstopping	**S**

Criterion	Evaluator's Summary Comments	Rating
	officers in UNOPS and UNDP Montreal Protocol Unit. The operational supervision of the implementation and certification were assigned to the international consultant. No monitoring was anticipated upon completion of the project.	
M&E Plan Implementation (use for adaptive management)	The M&E plan was implemented at a satisfactory level with assistance from the NOU and international consultants.	**S**
Budgeting and Funding for M&E activities	The budget had adequate resources to support monitoring and evaluation activities by UNDP/UNOPS staff and international consultants.	**S**
Catalytic Role	No catalytic effect was observed since SAGA was the only manufacturer of commercial refrigeration equipment in Armenia. UNDP gained experience that might be useful in implementation of similar projects elsewhere.	No ratings are requested for the catalytic role.
Preparation and readiness	The management of the enterprise finished all the construction work and preparation of the site well in time.	**S**
Country ownership / motivation	The Government attached a priority to the project and provided its support by facilitating the customs clearance and waving taxes on imported production equipment. The NOU provided all the necessary organizational support to the international consultant and the management of the enterprise during the implementation of the project. The Government did not succeed in adopting the legislation regulating imports of ODS contained refrigeration equipment.	**MS**
Stakeholders involvement	The project involved all relevant stakeholders in project preparation and execution.	**S**
financial planning	The budget covered all the eligible cost of equipment and activities associated with the conversion. The planning and management of the project ensured the proper flow of funds. The conversion was accomplished ahead of established timetable.	**S**
UNDP Supervision and backstopping	UNDP and UNOPS fulfilled their supervisory and backstopping responsibilities.	**S**
Overall Rating		**MS**

*8.1.8 ARM/04/*** - Phase out of CFCs in production of aerosols at Yerevan Household Chemistry Plant (UNDP/UNOPS);*

8.1.8.1 Background

477. The Yerevan Household Chemistry Plant (YHCP) was the only aerosol company in Armenia. YHCP commenced its aerosol operations in 1985. Its production fully satisfied the demand of the local market and was exported to other republics of the former Soviet Union and to countries in the Eastern Europe. Factory produced more than 30 items of household chemical industry. In 1995, the company was privatized. The company was manufacturing the following aerosol products: hair spray, insecticide, technical silicone and deodorants using the mixture of CFC-11 and CFC-12 in 50% to 50% proportion. The annual average consumption of ODS during the three year period of 1999 - 2001 was 14,333 tonnes of CFC-11/CFC-12. The phase out of ODS consumption by YHCP was a priority for the Government and was put in the list of projects identified in the Country Programme. The management of the company having been aware of the Government commitments to phase out ODS in Armenia agreed to participate in the conversion of the aerosols operations.

478. A UNDP consultant visited the enterprise in February 2002, and found that the plant was in full operation and financially sound. Yerevan Household Chemistry Plant had 25 employees. About 50 % of its produce was for national consumption and remainder was exported to Russian Federation, Ukraine and Georgia. The consultant discussed with the management the technological alternative to replace CFCs as propellants for industrial production of insecticides and technical aerosols.

479. The project was formulated and approved by the GEF for funding at the amount of $228,096 with co-financing of $35,200 from the enterprise. The objective of this project was to phase-out the use of CFC-11/CFC-12 in the manufacture of aerosols at YHCP by replacement with hydrocarbon propellant. This project was to eliminate the use of 14,333 ODP tonnes assisting to comply by Armenia with the 50% reduction of Annex A Group 1 substances by 2005.

8.1.8.2 Attainment of objectives and planned results

8.1.8.2.1 Objectives, outputs, outcomes and performance indicators

480. The outputs and planned activities are contained in the project implementation schedule. In the absence of the logframe for the evaluation of the Project, outcomes and performance indicators were inferred from the outputs/deliverables contained in the UNDP project document (Table 19).

Table 19: Phase out of CFCs out of CFCs in the production of aerosols at Yerevan Household Chemistry Plant: Objectives/ Intended Results - Outputs/Deliverables - Outcomes/Performance indicators

Objectives/Intended Results	Outputs/Deliverables	Outcomes/Performance indicators
1.The elimination of the use of CFCs in the manufacture of aerosol products at YHCP assisting the Government to meet the Montreal Protocol CFC phase out targets 2.The establishment of ODS-free aerosol manufacturing capacity in Armenia	1. Conversion of the aerosol manufacturing process at YHCP from the use of CFC-11/CFC-12 to hydrocarbon propellant. Deliverables: Procurement of new production equipment; Delivery of new production equipment to the country; Installation of new production equipment;; Training of personnel; Safety Certification; Test trials; Start up;	1. The phase out of 13.44 ODP tonnes in manufacturing of aerosol products facilitating compliance with the Montreal Protocol benchmarks The ODS-free production equipment is installed and commissioned; The personnel is trained; The manufacturing of ODS-free product is started; 2. Irreversibility of conversion CFC-based production equipment is destroyed or rendered unusable;

Objectives/Intended Results	Outputs/Deliverables	Outcomes/Performance indicators
	Commissioning;	The ban on imports of CFC-based equipment is introduced; 3. The stable production of aerosol product is maintained based on alternative ODS –free technologies avoiding the economic and social disruption after the conversion Stable production of non-ODS product; The new product is competitive on the local market; The output after the conversion is comparable or higher than the production before conversion.

8.1.8.2.2 Effectiveness

481. At the time of the formulation of the project, the plant was operating with three aerosol filling line (one Latvian made and two Armenian made). As a result of the project, the new filling line along with all the other related facilities was installed and commissioned allowing Yerevan Household Chemistry Plant to phase-out CFC 11/CFC 12 as a propellant in the production of aerosols replacing it with the ODP-free hydrocarbon propellant. The activities implemented under this project eliminated the use of 14,333 ODP tonnes, facilitating Armenia to comply with the 50% reduction of Annex A Group 1 substances by 2005. The project was completed on 9 August, 2006.

Figure 11: Coster gassing and crimping unit at YHCP

482. The project envisaged the installation of the filling room outside of the production area equipped with two conveyors and setting up a fenced storage farm for hydrocarbon propellant cylinder outside the building with related piping. The evaluation team visited the plant. The production arrangement was not in conformity with the project document. Changes have been made in the production set up in the course of the implementation of the project. Due to low production volume, all the new equipment has been provided and installed in the corner of the large existing production area, including destenching columns, Coster gassing and crimping units (Figure 11) equipped with the local ventilation and safety equipment. The hydrocarbon propellant is supplied from cylinders installed in the same premises.

483. UNDP/UNOPS managed to complete the project within 16 months. It can be explained by changes in the production set up made by management of the company. They did away with the installation of the prefabricated external gassing room and the connecting conveyor, external

storage rack for propellant cylinders. All the changes have been authorized by the supplier of the technology and local safety authorities. The company discontinued using CFCs and the ODS phase-out target was achieved.

484. However, based on observations of the evaluation team, the company is not sustainable. In once to be a very important producer of household chemical products, the plant has shown minimum signs of activities. Large premises were half empty and not heated although the outside temperatures were below zero in Yerevan area. The aerosol production was not in operation. The company experiences financial difficulties because of very low turnover. The stream of revenue in the aerosol industry depends very much on the economy of scale. The output of YHCP in recent years was a fraction of its installed capacity. The shortage of liquidity does not allow the company to expand the variety of its product and the production of aerosols has been limited to a campaign production of engine degreaser usually in summer time. Maintenance of the Coster equipment is difficult because of the supplier of technology is not always responsive and cost of spare parts is high. The company does not appear having both short-term and long- term strategy.

8.1.8.2.3 Relevance

485. Armenia joint the on the Montreal Protocol and ratified its Amendments and developed the Country Programme and National Action Plan in order to fulfil all the international obligations. The YHCP was the largest ODS consumer, therefore, the project was listed as a priority in the Armenia Country Programme on ODS Phase out.

486. The objectives of the project are consistent with the GEF Ozone Layer Depletion Focal Area that was established in response to the Montreal Protocol. The implementation of the Project is consistent with GEF operational policies and guidelines operational policies for financing activities in this focal area.

487. There are scientific evidences that CFCs and other ODSs also affect the climate system. The phase out of ODSs resulted in reduction of the global warming. The global warming effectiveness of ODS is expressed in CO_2-equivalent. As a result of global ODS phase out activities under the Montreal Protocol, the combined CO_2-equivalent emissions of ODSs decreased from 7.5 $GtCO_2$-eq per year in 1990 to 2.5 $GtCO_2$-eq per year in 2000[58] and was reduced further down to about 1.8 Gt CO_2-eq per year in 2007[59] as a result of ODS phase-out activities under the Montreal Protocol. These activities have significantly contributed to achieving the goals proclaimed in the Kyoto Protocol to the UN Framework Convention on Climate Change. Therefore, the Project is related to international activities on reduction of the global warming.

8.1.8.2.4 Efficiency

488. The project implementation timeline envisaged the commissioning of new equipment and completion of the project within 33 months from the time of its approval. The project was implemented by UNDP/UNOPS within 16 months in the period from March 2005 until August 2006 with 17 months ahead of schedule.

489. The GEF operational policies for financing activities in the ozone focal are followed the guidelines established by the Executive Committee of the Multilateral Fund. According to these guidelines, the cost-effectiveness threshold in the aerosol sector was determined to be $4.4/kg ODP phased out. Originally, the total YHCP project cost was determined at the amount $335,270 with the cost-effectiveness of $23.42 six times the sector threshold established in MLF guidelines. The GEF STAP reviewer draw attention of UNDP on the relatively small size of aerosol operations of the plant and poor cost-effectiveness of the project and proposed to reconsider the claimed incremental cost. UNDP has referred to one of the projects in Article 5 low volume consuming country that was approved by MLF with the cost-effectiveness of $14.7/kg ODP, and adjusted the cost of the YHCP project to $211,200. Armenia is also the low volume consuming country according to MLF classification. The GEF Secretariat accepted the arguments of UNDP and approved the project.

---

58 I PCC/TEAP Special Report on Safeguarding the Ozone Layer and the Global Climate System: Issues Related to Hydrocarbons and Perfluorocarbons; 2003

59 Velders, J.M., Andersen, S.O., Daniel, J.S., Fahey, D.W. and M. McFarland. 2007. The Importance of the Montreal Protocol in protecting climate

490. UNDP calculated net operating savings for 4 years amounting to $10,084 (based on perfumery filling) that was not taken into account in determining the grant value due to GEF policies. The enterprise committed $35,200 of their own resources covering some of capital costs of conversion.

8.1.8.3 Assessment of Sustainability of project outcomes

8.1.8.3.1 Financial resources

491. The financial resources provided by GEF of $228,096 covered the essential capital cost of the conversion, including procurement and installation of Coster aerosol and liquid product filling machine with gas management system, destenching column system, transfer pump, emergency shut-off valve, technology transfer and technical advisory services. The company committed resources of $35,200 to cover the cost of fenced hydrocarbon propellant cylinder storage farm and related piping, site preparation, extract ventilation in the production area, ex-proofed lighting, grounding, fire control and the local safety audit. UNDP calculated annual savings of $7,125 due to lower cost of propellant material and increase in the cost of maintenance of $3,378.

Figure 12: Household chemical products made at YHCP

492. Currently, the company experiences shortage of liquidity and the production of aerosols has been limited to engine cleaning degreasers being produced by a single round of a campaign production usually in summer time when there is a demand for such product. The company stopped production of aerosol air fresheners (Figure 12) because the destenching columns have not sufficient capacity and the company cannot afford frequent replacement of costly ceolyte in adsorption columns. The company experiences problems with supply of hydrocarbon propellant due to high customs expense. YHCP is involved in manufacturing of other than aerosol household chemicals that allow the company to maintain aerosol production at such a low level. In the very competitive environment that is observed in the aerosol industry, the future of the aerosol production by the company and its sustainability is uncertain.

8.1.8.3.2 Socio-political

493. The risk to the sustainability of the outcomes of the project is not stemming from the socio-political system. The NOU and the Government are aware about the situation in YHCP. However, in the market economy, the Government has very limited means and resources to correct the situation in this private company. The management of the enterprise failed to adapt to the very competitive environment in the global aerosol industry. The enterprise workforce engaged in the aerosol production was substantially reduced.

8.1.8.3.3 Institutional framework and governance

494. The Government and NOU provided the necessary support to the management of the enterprise during the implementation of the conversion. The NOU was actively interacting with the State Customs Committee to ensure the timely clearance of imported production equipment. Once the project was completed, the management of YHCP assumed the responsibility for the sustainability of the outcomes. It is unlikely that legislative, policy or government actions could have any impact on the sustainability of the project.

8.1.8.3.4 Environmental

495. The conversion is irreversible. The project achieved its objectives eliminating 14.3 ODP tonnes of CFC-11/CFC-12 consumption.

8.1.8.4 Catalytic role

496. YHCP was the only aerosol producer in Armenia. No replication or catalytic effect of the project was identified. The experience of YHCP conversion might be useful for UNDP/UNOPS and the

Government.

8.1.8.5 Achievement of outputs and activities

497. The following outputs related to the project execution have been achieved: procurement of new production equipment; delivery and installation of new production equipment, start up, on-job-training of personnel, trial production of new product, safety training and certification; test trials, start up, commissioning, destruction of CFC-based production equipment. The project was executed with 17 months ahead of schedule. The company discontinued using CFC propellants and the ODS phase-out target was achieved. However, the sustainability of the enterprise is questionable.

8.1.8.6 Assessment of Monitoring and Evaluation Systems

8.1.8.6.1 M&E design

498. The M&E plan as such was not part of the project document. The project document includes the implementation schedule reflecting the timing of major steps of conversion with the overall duration of 36 months. It appears that the monitoring has been implemented by backstopping officers in UNOPS and UNDP Montreal Protocol Unit. The international consultant was assigned to develop the conversion plan that was agreed with the Government and the management of the enterprise. The same international consultant supervised the implementation of the project in cooperation with the NOU and the UNDP local office. The project envisaged also a mission of a UNOPS consultant to make the final evaluation and sign the Certificate of Completion.

499. The M&E design did not include the monitoring of economic and financial variables that would determine the viability of GEF investment and the prospects of sustainable operation of the enterprise after the conversion.

8.1.8.6.2 M&E plan implementation

500. There are no reports available demonstrating the M&E activities performed by UNDP/UNOPS. It appears that the international consultants supervised the implementation and visited twice the project site providing the necessary expertise in planning and certification of the completion of conversion in August 2006. UNDP was not able to provide the Certificate of Completion and the final project evaluations report to the evaluation team.

8.1.8.6.3 Budgeting and Funding for M&E activities

501. The budget of the project does not include resources specifically earmarked for monitoring, evaluation and supervision activities. There are the following allocations that are partially related to M&E activities: $16,896 for executing agency support costs, $20,000 for technology transfer/technical advisory services and $5,000 for the evaluation mission.

8.1.8.6.4 Long-term Monitoring

502. The long term monitoring was not envisaged in the project. The responsibilities of executing agencies came to an end upon signing the certificate of completion. The NOU is interacting with the company as necessary.

8.1.8.7 Assessment of processes that affected attainment of project results

8.1.8.7.1 Preparation and readiness

503. UNDP discussed the selection of conversion technology with the management of YHCP. The design of the UNDP project on conversion of YHCP to hydrocarbon technology followed the pattern of aerosol conversion projects approved by MLF in many Article 5 countries. The project design was endorsed by the GEF STAP reviewer but the reviewer recommended reducing the budget to adhere to existing MLF cost-effectiveness threshold. UNDP adjusted the budget but the financing of several budget items, including safety features have been taken over by the enterprise. UNDP included a caveat passing on all the responsibilities for the authorization of changes in the design and safety certification to the management of the company.

504. The company is experiencing financial difficulties. UNDP did not undertake the financial viability tests that would assist the company to adjust its business plan taking into account the market

situation in the aerosol sector and macro-economic conditions that prevailed in Armenia at the time of the Project.

8.1.8.7.2 Country commitment

505. The Government considered the YHCP conversion as a priority project in assisting the country to comply with its Montreal Protocol obligations. The Government was aware of economic difficulties experienced by the enterprise. However, the Government is not in a position to intervene in the business of the private company.

8.1.8.7.3 Stakeholder involvement

506. The project involved directly the management of the enterprise at each step of its implementation as well as UNOPS international consultants, UNDP Headquarters and its local office in Yerevan. The NOU provided all the necessary organizational support to international consultants and the management of the enterprise during the implementation of the project. The enterprise has been interacting with the supplier of the technology and the local safety authority, and managed to resolve all the safety issues and obtained the necessary authorizations.

8.1.8.7.4 Financial planning

507. The budget covered the procurement, installation, training, commissioning and start up of production equipment and activities. The enterprise took responsibilities for financing the installation of the external gassing room and hydrocarbon cylinder storage rack located outside of the building within committed $35,200 of cost sharing. The company changed the design of the production set up obtaining authorization from the technology supplier.

508. There were no reports made available by UNDP to the evaluation team on financial planning in this project such as financial controls, reporting and management. Since there were no complaints from the enterprise it appears that the planning and management of the project on part of UNDP and UNOPS ensured the proper flow of funds. The conversion was accomplished with 17 months ahead of the established timetable.

8.1.8.7.5 UNEP / UNDP Supervision and backstopping

509. According to the NOU, the international consultant supervised the implementation and visited twice the project site providing the necessary expertise in planning, installation of production equipment together with the technology supplier and certification of the completion of conversion. UNDP was not able to provide the Certificate of Completion and the final project evaluations report to the evaluation team. UNDP did not undertake the financial viability tests that would assess business perspectives of the company within the macro-economic conditions that prevailed in Armenia at the time of the Project.

8.1.8.7.6 Co-financing and Project Outcomes & Sustainability

510. The management of the enterprise have not fully complied with commitments on cost sharing. Some elements of production design have not been implemented as planned and resulted in reduced production capacity. These changes, however, had no negative impact on the project outcomes. The company is not able to utilize the existing production capabilities because of financial difficulties. The future of the company is uncertain.

8.1.8.7.7 Delays and Project Outcomes & Sustainability

511. There were no delays in the implementation of the project. The project was completed with 17 months ahead of schedule. Risks to the sustainability of the enterprise are associated with permanent financial difficulties.

512. The ratings for the Yerevan aerosol project in Armenia are shown in Table 20.

Table 20: Ratings for the Yerevan aerosol project in Armenia

Criterion	Evaluator's Summary Comments	Rating

Criterion	Evaluator's Summary Comments	Rating
Attainment of project objectives and results (overall rating)	The project had moderate shortcomings in achievements of its objectives in terms of effectiveness and efficiency.	**MS**
Effectiveness	As a result of the project, consumption of 14,333 ODP tonnes was phased out facilitating Armenia to comply with the 50% reduction of Annex A group 1 substances by 2005. The production of aerosol non-ODS product after the conversion constitute constitutes a fraction of the installed capacity.	**MS**
Relevance	The project outcomes are fully consistent with country priorities and with ozone and climate international treaties.	**HS**
Efficiency	The project was completed with 17 months ahead of schedule. The cost-effectiveness is less beneficial than the MLF threshold by a factor of three.	**MU**
Sustainability of Project outcomes (overall rating)	The conversion to non-ODS propellant is irreversible. The enterprise experiences serious financial difficulties. The future of the company is uncertain.	**MU**
Financial	Upon completion of the project, the enterprise experienced financial difficulties reducing production to one product with output constituting a fraction of the installed capacity. The future of the company is still uncertain.	**MU**
Socio Political	The risk to the sustainability of the outcomes of the project is not stemming from the socio-political system. The enterprise management failed to adapt to the very competitive environment in the aerosol industry. The workforce engaged in the aerosol production was substantially reduced.	**S**
Institutional framework and governance	The Government and NOU provided the necessary support to the management of the enterprise during the implementation of the conversion. The sustainability of the enterprise is questionable. It is unlikely, however, that legislative, policy or government actions could have any impact on the sustainability of the project.	**S**
Environmental	The conversion is irreversible. The project achieved its objectives eliminating 14.3 ODP tonnes of CFC-11/CFC-12 consumption.	**S**
Achievement of outputs and activities	The outputs were delivered with 17 months ahead of schedule.	**S**

Criterion	Evaluator's Summary Comments	Rating
Monitoring and Evaluation (overall rating)	The M&E design, implementation and funding had significant shortcomings.	**MU**
M&E Design	The M&E plan was not part of the project document. The project document includes the implementation schedule reflecting the timing of major steps of conversion.	**MU**
M&E Plan Implementation (use for adaptive management)	There were no reports available demonstrating the implementation of M&E Plan. The international consultants supervised the implementation and twice visited the site to provide expertise in planning and certification of the conversion	**MU**
Budgeting and Funding for M&E activities	The budget of the project does not include resources specifically earmarked for monitoring, evaluation and supervision activities. There were budget allocations for executing agency support costs and technology transfer, technical advisory services and the final evaluation mission that were supposedly utilized for M&E activities.	**MU**
Catalytic Role	No catalytic effect was observed since YHCP is the only aerosol producer in the country.	No ratings required
Preparation and readiness	The company made all the necessary preparation and construction work. The design of the UNDP project on conversion of YHCP to hydrocarbon technology followed the pattern of aerosol conversion projects approved by MLF in many Article 5 countries. UNDP did not undertake financial viability tests that would reduce the risk to sustainability.	**MS**
Country ownership / motivation	The Government considered the YHCP conversion as a priority project in assisting the country to comply with its Montreal Protocol obligations.	**S**
Stakeholders involvement	The project involved all relevant stakeholders in the project execution.	**S**
Financial planning	The budget covered all the major steps of conversion. There were no reports made available by UNDP to the evaluation team on financial planning, control and management.	**Unable to assess**
UNEP Supervision and backstopping	According to the NOU, the international consultant supervised the implementation and visited twice the project site providing the necessary expertise. UNDP was not able to provide the Certificate of Completion and the final project evaluations report to the evaluation team.	**MS**
Overall Rating		**MS**

2 Azerbaijan

8.2.1 Background

513. Azerbaijan declared independence from the former Soviet Union in August 1991 and became a republic in April 1992. Azerbaijan is rich in mineral resources including oil and gas, which were largely responsible for promoting its annual average growth for the past 5 years to 21%. As a result of its improved economic performance, the percentage of the population in poverty was reduced from 39.7% in 2003 to 20.8% in 2006. Gross national income per capita was $2,600 in 2007. Poverty reduction continues to be one of the challenges for Azerbaijan.

514. The initial country programme for the phase-out of ODS was compiled in 1997 at the initiative of the UNEP/DTIE, based on the data survey of ODS consumption in various sectors, conducted by the National Ozone Team. In 1996, Azerbaijan used ODS in the refrigeration (CFCs), fire-fighting (halon), solvent (CFCs, methyl chloroform) and foam blowing (CFCs) sectors. Refrigeration accounted for little less than half of the total, fire-fighting for slightly more than half. Azerbaijan reported a halon consumption of 501.2 ODP-tonnes, but UNDP later determined that this might be installed in equipment rather than consumed.

515. Azerbaijan acceded to the Vienna Convention, the Montreal Protocol, the London and Copenhagen Amendments in 1996. As a developed country that was formerly a part of the Soviet Union, Azerbaijan was required to, *inter alia*, phase out the consumption of halon on 1 January 1994; and to phase out CFCs by 1 January 1996. Azerbaijan approved the Montreal Amendment in 2000.

516. In 1998, the Parties to the Montreal Protocol noted that Azerbaijan was in non-compliance with its control obligations as consumption of 456.5 ODP-tonnes of CFC and 501.2 ODP tonnes of halon[60] was reported in 1996[61]. About 93% of CFC consumption was in the refrigeration sector, 6% in the foam blowing sector with remaining 1% in the solvent sector. Azerbaijan believed that this situation would continue to at least until 2000. Based on its Country Programme, Azerbaijan committed to:

- To establish by 1 January 1999, a system for licensing imports and exports of ODS;
- To establish a system for licensing operators in the refrigeration-servicing sector;
- To tax the imports of ozone-depleting substances, to enable it to ensure that it meets the year 2001 phase-out;
- Phase out CFC consumption by 1 January 2001;
- Ban on all imports of halon by 1 January 2001; and
- To consider by 1999, a ban on the import of ODS-based equipment.

517. These commitments have been noted by the Parties in Decision X/20. In the same decision, the Parties specifically urged Azerbaijan to work with the relevant Implementing Agencies to implement non-ODS alternatives, and to quickly develop a system for managing banked halon for any continuing critical uses. The Government of Azerbaijan requested GEF assistance to enable it to comply with provisions of the Montreal Protocol.

518. The GEF Council approved the Project for Azerbaijan in March 1998 and the grant agreement was signed in February 1999. The objectives of the Project were to assist Azerbaijan to phase-

---

[60] Later UNDP identified only about 100 ODP tonnes of halon consumption

[61] Decision X/20: Compliance of Azerbaijan with the Montreal Protocol.

out its ODS consumption by providing financial support to a series of sub-projects. The GEF project is formulated as a framework project consisting of a technical assistance and training component implemented by UNEP and a technology conversion component implemented by UNDP. The project comprised six sub-projects.

519. Under UNEP technical assistant and training component funding was provided for *Training the Trainers in Refrigeration* to train trainers in servicing, maintenance and repair in the refrigeration sector and for *Institutional Strengthening* which was designed to provide assistance for co-ordinating the implementation of the Country Programme, including training of customs officers for monitoring and control of ODS. Under the technology conversion component UNDP provided the recovery and recycling equipment to establish the system of recovery, reclamation and reuse of CFC refrigerants avoiding imports of new CFC refrigerants for servicing the existing refrigeration equipment. Two investment sub-projects were to convert: *Chinar domestic refrigerator manufacturer* from using CFC-12 in the refrigerant cycle and CFC-11 in foam blowing operations to HFC-134a/isobutane and cyclopentane technology respectively, and *Sumgayit compressor manufacturer* to enable production of HFC-134a and iso-butane compressors to be used by Chinar and exported to other countries in the region. The consumption in the fire-fighting sector was addressed through establishment of the national halon management system.

520. The project was financed by a GEF grant of US$ 7,047,294 and contributions from the beneficiaries / Government amounted to US$ 2,652,783. The breakdown of the project cost and associated ODP to be phased out is shown in Table 21.

- RER/96/G41 - Country Programme & Project Preparation;
- GF/2110-99-03 - Institutional Strengthening and Capacity Building, – Establishment of an Ozone Office (UNEP);
- GF/4040-02-04 – Training of trainers for use of ODS-free refrigerants (UNEP);
- AZE/98/G33 - Recovery and recycling of ODS refrigerants in the air-conditioning and refrigeration sector (UNDP/UNOPS);
- AZE/98/G31 - Conversion of compressor manufacturing facility in Sumgayit (UNDP/UNOPS);
- AZE/98/G32 - Elimination of CFCs in the manufacture of domestic refrigerators at Chinar (UNDP/UNOPS);
- AZE/98/G34 – Halon management and banking national recovery/recycling centre (UNDP/UNOPS);

Table 21: Sub-projects that contributed to the Phase-out of ozone-depleting substances in Azerbaijan

	Project index	Title	Executing Agency	Years	ODP Phase-out (ODP Tonnes)	GEF budget[1] (US $)	Co-funding (US $)
1	RER/96/G41	Country Programme & Project Preparation	UNDP/UNEP	1	N/A	117,500	
2	GF/2110-99-03	Institutional Strengthening and Capacity Building – Establishment of an Ozone Office	UNEP	3	N/A	267,000	36,000[2]
3	GF/4040-02-04	Training of trainers for use of ODS-free refrigerants	UNEP	1	N/A	114,900	
4	AZE/98/G33	Recovery and recycling of ODS	UNDP/UNOPS	2	85.0	1,106,401	

	Project index	Title	Executing Agency	Years	ODP Phase-out (ODP Tonnes)	GEF budget[1] (US $)	Co-funding (US $)
		refrigerants in the air-conditioning and refrigeration sector					
5	AZE/98/G31	Conversion of manufacturing facilities at Sumgait compressor plant	UNDP/UNOPS	2	N/A	2,399,738	2,190,000[3]
6	AZE/98/G32	Elimination of CFCs in the manufacture of domestic refrigerators at Chinar	UNDP/UNOPS	2	122.4	2,906,496	448,683[4]
7	AZE/98/G34	Halon management and banking national recovery/recycling centre	UNDP/UNOPS	2	100	135,259	
		Total			**307.4**	**7,047,294**	**2,674,783**

[1] This amount includes UNOPS / UNEP Executing Agency Support Cost and Cost of the Project Support Services provided by the UNDP country office. N/A = not applicable; [2]The Government contribution to the project included office space, local telephone, office furniture, and local travel; [3]Industry contribution to the project (production equipment); [4]Industry in-kind contribution that corresponds to the incremental operating costs for ½ year.

521. The terminal evaluation of the GEF ODS phase out project in Azerbaijan has faced a number of obstacles. The project with all its components was reported as completed in 2002. The field work of the terminal evaluation was carried out in February 2009. The acting Director of the Centre on Climate Change and Ozone (CCCO) and the Ozone Officer were just recently appointed and had a very limited information about the past ODS phase out activities and the current status of ozone related issues in Azerbaijan. The archive of documentation related to the implementation of the ODS phase out program in the country was poorly managed and virtually does not exist. The evaluator had no opportunity working with the UNEP DTIE archive in Paris since most of the documentation pertinent to activities in CEITs was discarded once the management of ozone related activities in CEITs was transferred to UNEP DGEF. The significant portion of the UNDP data base related to the past activities in CEITs was also lost due to an inadvertent damage in the computer system. It was not possible to reach some key consultants working for UNDP/UNOPS in Azerbaijan. The interview with the Director of "Chinar"[62] domestic refrigeration plant, Director of "Titan" Group, representative of the State Customs Committee and former Director of the CCCO and ozone focal point in 2003 to 2008 was the major source of information on the past and current status of ozone related issues in Azerbaijan. The UNDP Project Implementation Report, project documents and the 2004 UNEP Mid-Term Evaluation Report were also the basis of the analysis of results of the ODS phase-out program in Azerbaijan.

522. It should be noted that the mid-term evaluation of the GEF ODS project in Azerbaijan and the field visit to the country were conducted in April 2004 i.e. two years after the project completion. The NOU ceased to exist with closure of the project in 2002. The mid-term evaluator obtained the most relevant information from the interview with the former Head of the NOU. Some general information was provided by a new Director of the CCCO appointed in 2003.

523. The design of the UNEP and UNDP projects did not require clearly defined logframes and prior

[62] http://www.cinar-az.com/en/index-en.php

agreed performance indicators (PIs) at the time of their formulation and approval. The 2004 Mid-Term Review has also identified the issue of absence of results-based management and accountability frameworks, including PIs in UNEP and UNDP sub-projects. Therefore, it has been necessary to retrospectively formulate some of project outputs and outcomes, and PIs based on results of mid-term and terminal evaluations.

8.2.1.1 GF/2110-99-03 - Institutional Strengthening and Capacity Building – Establishment of an Ozone Office

8.2.1.1.1 Objectives/Goals

524. The main objective of the project is to strengthen the national capacity in order to facilitate the efficient and effective coordination and management of actions outlined in the Country Program and the Refrigerant Management Plan (RMP), and to meet the expectations expressed in MOP Decision X/20. More specifically, the project seeks to: 1) to establish a NOU which would undertake and monitor the implementation of the CP and the RMP; 2) to facilitate the adoption of a legal and regulatory system that ensure the compliance with MP obligations; 3) to raise ODS consciousness of the general public promote the strategy for the accelerated ODS phase out in industry through the implementation of awareness programme; 4) to support and encourage the local industry in adopting ODS-free substitute technologies; 5) to coordinate implementation of ODS phase out activities envisaged in UNEP, UNDP/UNOPS sub-projects; 6) to enable the collection of the required data on ODS use and consumption and reporting to the Ozone Secretariat and IAs. In the final analysis, the ultimate goal of the country ODS phase out programme and this sub-project was to eliminate the use of CFCs and to meet the requirements of the Montreal Protocol.

8.2.1.1.2 Effectiveness: Performance indicators

525. In the absence of the logframe for the evaluation of the IS component, the performance indicators were inferred from the outputs/ deliverables contained in the project document, UNDP PIRs, mid-term evaluation report and assessed as commensurate real outcomes as shown in Table 22.

Table 22: Azerbaijan Institutional Strengthening Project - Objectives/ Intended Results - Outputs/Deliverables – Outcomes and Performance indicators

Objectives/Intended Results	Outputs/Deliverables	Outcomes/Performance indicators
1. Strengthening of the national capacity to effectively coordinate and administer the actions outlined in CP and RMP	1. Establishing NOU and initiating actions that created a suitable climate in the country for the expeditious phase-out • Time required to UNEP to disburse the first funding tranche; • Timely recruitment of sufficient and qualified NOU staff; • Timely establishment of adequate NOU infrastructure; • Provision of the counterpart funding;	1. Evidence of strengthened institutional capacity and improved coordination among stakeholders. • Continuity of NOU staff and operation; • Establishment of the Interagency Committee; • Approval of the Action Plan; • Access of NOU staff to decision makers; •
2. The facilitation of legislative measures for	• 2 Political priority assigned by the Government to environmental issues and	• 2. Introduction of legal acts regulating ODS import and use related

Objectives/Intended Results	Outputs/Deliverables	Outcomes/Performance indicators
the phase-out of ODS;	the MP in particular • • Development and promotion of legislative acts and regulations on control of ODS ;	issues and their enforcement. • Ratification of MP Amendments; • Adoption of legislation on ODS import/export licensing system in 2002 ; • Establishment of ODS import quota system; • Register of authorized importers; • Introduction of ban on trade of ODS and equipment containing ODS; • Adoption of qualification requirements in refrigeration servicing; • Adoption of legislation that mandates 3R activities; • Measures on enforcement of legislation through training of customs officers; • Introduction of taxes in trade of ODS and incentives in trade of alternatives; • Change of market price relations between CFCs and substitutes;
3. Availability of trained custom officers	3. Establishing training centres; 4. Development and translation of a training manual; 5. Conducting a training workshop for trainers with participation of higher level officials from customs and other government departments (Phase 1); 6. Conducting the training programme on application of the licensing system and	4. Enforcement of ODS import licensing and quota system through training of customs officers. 5. Reduction in illegal trade of ODS. 6. Improvement in ODS data collection resulting from the raised awareness about ODS import licensing and quota system among higher level officials from customs and other government departments;

Objectives/Intended Results	Outputs/Deliverables	Outcomes/Performance indicators
	identification equipment for customs officers at border checking points(Phase 2);	• Number of customs training courses conducted and officers trained; • Establishment of in-country customs training capacity; • Continuity (follow-up, refreshment) of training activities; • Availability of curricula and material used in customs training; • Adequate number of ODS identifiers supplied; • Effective use of identifiers; • Availability of computerized customs data system;
3. The facilitation of increased coordination and monitoring of the CP and RMP	7. Effective interaction with governmental institutions and agencies; 8. Increased cooperation with business sector and professional associations; 9. Assistance in coordination and monitoring of implementation of investment and training projects executed by IAs as part of the RMP; 10. Assistance in the preparation of budgets and advice on the release of funds from the GEF;	3. Improved coordination and monitoring in implementation of the CP and RMP. • Evidences of access of NOU to and interaction with decision makers, steering committees or inter-ministerial bodies; • Involvement of private sector stakeholders; • Establishment and support of the Refrigeration Association; • Successful completion of training of custom officers together with UNEP; • Successful completion of training in good servicing practices together with UNEP; • Successful completion of training of R/R operators together with UNDP; • Successful completion of conversion of Sumgayit compressor plant to non-ODS technology; • Successful conversion of “Chinar” refrigerator manufacturing plant to non-ODS technology

	Outputs/Deliverables	Outcomes/Performance indicators
4. The design and implementation of ODS awareness programme	11. Conducting awareness workshops for central and regional governmental officials, environmental inspectors and customs officers on ozone layer and MP issues; 12. TV and radio interviews on ozone layer protection issues; 13. Dissemination of booklets about ozone layer protection, and implementation of National ODS Phase out Programme;	4. Improved communication with and effective engagement of governmental and non-governmental institutions, professional organizations, private sector and general public in ODS phase out activities. • 5. Reduction of ODS consumption due to public awareness programme. • Number of workshops and degree of participation of institutions listed in Item 4. above in awareness programme and related ODS phase out activities; • Number of publications prepared and disseminated; • Degree of market penetration of ODS free products;
5. Support and encourage of local industry and technical institutions in adopting ODS-free substitute technologies	14. Support in conversion of manufacturing domestic refrigeration appliances at "Chinar"; 15. Support in conversion of Sumgayit compressor plant; 16. Coordination in provision of R&R equipment and modern tools to servicing workshops in domestic, commercial refrigeration and A/C sector; 17. Coordination in creating the halon bank and recycling and management;	6. Adoption ODS-free substitute technology by "Chinar". • Commercial production of ODS-free product; • 7. Adoption of ODS-free substitute technology by Sumgayit compressor plant • Commercial production of ODS-free compressors; 8. Adoption of good servicing practices and availability of modern tools in the refrigeration sector, including recovery and recycling. • Number of R&R and servicing kits provided to servicing enterprises;
6. Facilitate / enable the collection of the required	18. Collection, analysis and exchange of MP related	9. Establishment of the line of communication with the

Objectives/Intended Results	Outputs/Deliverables	Outcomes/Performance indicators
data on ODS use and consumption, establish the line of information exchange in the country and reporting to the Ozone Secretariat and IAs.	information in the country and the region, including annual reports on ODS consumption and NOU activities to the Ozone Secretariat (OS); 19. Preparation and submission of necessary information and reports to the implementing agencies; 20. Exchange of experience between the NOU and other Network members to combat illegal trade in ODS, including sub-regional cooperation; 21. Participate in the regional training for the Custom Officials of Countries with Economies in Transition to facilitate the implementation of regionally unified procedures for using tariff classifications and monitoring, control and reporting of data on trading of ODS;	Customs, and licensed importers to collect ODS import data. • Timely availability of Article 7 data in the Ozone Secretariat. • Creation of ODS database; 10. Establishment of the line of communication with the Ozone Secretariat and NOUs in border countries, . • Communication of MP related information to UNEP Ozone Secretariat (OS); • Reporting to the Implementation Committee; • Participation in Central Asia and Eastern Europe Networking; • Improvement of the quality of NOU reporting to IAs;
7. Facilitate the Government of Azerbaijan in reduction and phase out of consumption of controlled ODS.	22. Coordination of the implementation of the National ODS Phase- out Programme to meet compliance obligations.	11. Compliance with ODS phase out schedule established in Decision X/20 of the Parties; 12. Compliance with Halon reduction schedule established in Decision X/20 of the Parties;

8.2.1.1.3 Attainment of objectives and planned results: Effectiveness

526. The assessment of achieved results and their effectiveness involve the analysis of how the intended results as formulated in the sub-project were achieved and inputs have been translated into outputs and long-term outcomes, and impact. Performance indicators formulated in the third column of Table 2 served as evaluation tools. The effectiveness, relevance and efficiency were used as qualifiers in measuring the success or failure as appropriate.

8.2.1.1.3.1 Establishment of the Ozone Office

527. The IS project provided resources to the State Committee of Ecology and Nature Resources Management (SCENRM) that was later reorganized into the Ministry of Ecology and Natural Resources (MENR) for strengthening the national institutional structure and monitoring the ODS

phase-out activities for a period of three years. UNEP approved the IS project in May 1999. The first tranche of the approved budget was disbursed through the UNDP local office. The exact date of the first disbursement is not known. This support included computing and communications equipment, operating costs including telecommunications and office supplies, staff support for a national project coordinator and NOU personnel, funding for essential public awareness and project support services.

528. The National Ozone Unit (NOU) was established in SCENRM effectively staffed with the National Coordinator, an assistant coordinator on industrial issues, an assistant coordinator on legislative issues, an accountant and a secretary. The head of the NOU held a position of a professor in the department of refrigeration of the Baku Polytechnic Institute. The Government made its contribution to the project including the office space, local telephone, office furniture, and local travel. A part time assistance was also provided by the Ministry personnel. The monetary value of the Government contribution was assessed in US $36,000. The GEF support of the NOU was originally scheduled for 3 years until the end of 2002.

529. The Cabinet of Ministers designated the Chairman of the SCENRM as a project manager for the implementation of activities envisaged in the Country Program. No acting Interagency Committee was formed to co-ordinate ODS phase-out activities at the country level. As appropriate, there were meetings with representatives from the SCENRM, UNDP Office in Azerbaijan and if necessary from Government agencies concerned. The mid-term evaluation report indicates that according to the former Head of the NOU, a clear and comprehensive mandate was given to the NOU and SCENRM to coordinate the Government's activities in order to meet the country commitments under the MP. The former NOU head confirmed that the NOU had an access to decision makers and enforcement agencies.

530. The NOU prepared its working plans for 2000, 2001 and 2002 according to timetables developed by UNEP and UNDP in their respective sub-projects. The IS sub-project was completed as planned and financially closed in June 2002. One of the important outcomes of the IS project was attained. The fully functioning NOU was established and continued it operations in support of other investment and non-investment GEF sub-projects until their completion. With completion of the IS project in 2002, the NOU ceased to exist. All the NOU personnel were released from the MENR. About a year later, the Centre on Climate Change and Ozone (CCCO) was established in the National Hydrometeorological Agency (HMA) supervised by the MENR. The integration of climate and ozone related activities was a positive step towards achieving a synergy in tackling climate and ODS phase out issues. However, the creation of CCCO under HMA signified a decline of the importance of ozone related issues. The CCCO as part of HMA occupied a lower position in the Government hierarchy of the decision making process. The director of CCCO was appointed in 2003 and held his position until 2008. The newly appointed director of CCCO as well as a new ozone officer has no previous experience in dealing with ODS issues. The CCCO maintains liaison with MENR through Division of Environmental and Nature Protection Policy. The management of CCCO indicated that decisions involving other ministries have been taken in the Cabinet of Ministers. The access of the Ozone Office to decision makers has been essentially weakened.

8.2.1.1.3.2 Adoption of legislative acts and regulations on control of ODS and its enforcement

531. By approval the ODS Phase-out Country Programme the Government committed to the following legislative undertakings: 1) to establish by 1 January 1999, a system for licensing imports and exports of ODS; 2) to adopt a system for licensing operators in the refrigeration servicing sector; 3) to introduce taxation on the imports of ozone-depleting substances to ensure the year 2001 phase-out; 4) to consider by 1999, a ban on the import of ODS-based equipment; 5) to introduce a ban on all imports of halon by 1 January 2001. The same benchmarks have been incorporated into Decision X/20 taken at the 10th Meeting of the Parties to the Montreal Protocol.

532. The NOU was involved in preparing legislative drafts and promoting their approval by the President. In March 2001, the President approved the Law on Protection of Atmospheric Air[63]. The Law established the general principles and regulations of the use and release of harmful substances, including ODS into the atmosphere. The law established the rights and

[63] Decree No. 109-IIQ of 27 March 2001 Law of Azerbaijan Republic on the Protection of Atmospheric Air

responsibilities of Government and private entities involved, including the requirement for issuing permits. In its Decree No 501, the President requested the specific responsible Governmental agencies and the Ministry of Ecology and Natural Resources in particular to develop and submit for approval the necessary legislation drafts to enact the Law on Protection of Atmospheric Air.[64] The NOU prepared the draft of the Decree on introduction of a licensing system in ODS imports/exports. The development of the licensing system in Azerbaijan was facilitated through the participation of Governmental officials in the UNEP regional workshop held in Baku in June 2000 that was designed for the needs of Central Asian countries and Azerbaijan. The workshop was organized as a part of the UNEP 21-country compliance project: Promoting compliance with trade and licensing provisions (GF/2110-98-050). Subsequently, the Decree was signed by the President in December 2000.

533. According to the mid-term evaluation report, the NOU prepared and submitted legislative drafts on: 1) Production, storage, processing, collection, destruction and recycling of the ozone depleting substances and ODS containing products contained them; and 2) The list of activities, requiring special permissions (licenses), and of the executive bodies responsible for granting these permissions. Unfortunately, these initiatives have not been supported by the Cabinet.

534. Thus, the ODS imports licensing system implemented by the NOU and the MENR was a major tool regulating imports of ODS to the country. Azerbaijan banned the import of halon in 1997. Quotas for CFC imports were established for the period 1997 to 1 January 2002 that was determined as the date of the complete CFC phase out.

535. The momentum in promoting further legislative activities was lost after the closure of the IS project in 2002. The adopted licensing system was not well enforced to stop imports of CFCs. Azerbaijan was in non-compliance in 2001, 2002, 2003, 2004 and 2005. Imports of CFCs continued contrary to the Government promised undertakings. The issue of non-compliance of Azerbaijan was before the every meeting of the Implementation Committee in 2003 to 2006. The deliberations in the Implementation Committee with participation of the representative of Azerbaijan revealed that the lack of expertise and legislation impaired its ability to meet its agreed commitments. Consequently, the Parties of the Montreal Protocol extended several times the deadline for the complete CFC phase-out. In an effort to assist Azerbaijan to meet its commitments, the Parties in 2005 were requested to halt all exports of CFCs to Azerbaijan. The Parties cautioned Azerbaijan that further action would be taken unless the country phased out CFCs by 1 January 2006. On 12 September 2005, the President of Azerbaijan had signed an executive order which, among other things, had effected a ban on imports of ODS, and that the national customs authorities had been instructed to halt all the import of ODS into the country. Azerbaijan reported zero CFC consumption in 2006.

536. The NOU in cooperation with the MENR submitted the proposal on acceding to the Montreal Amendment that was approved by the Parliament of Azerbaijan in September 2000. The ratification of the Beijing Amendment is still pending. Until now, the Government has not fulfilled its undertaking included in Decision X/20 to establish a system for licensing operators in the refrigeration servicing sector; to tax the imports of ozone-depleting substances, and to introduce a ban on the import of ODS-based equipment.

537. In their decisions regarding non-compliance of Azerbaijan, the Parries recognized the limited capacity of CCCO and recommended to seek further assistance from UNEP and GEF for capacity building in Azerbaijan. The GEF approved the project Continued Institutional Strengthening Support (CISS) for CEITs to meet the obligations of the Montreal Protocol for four CEITs, including Azerbaijan[65]. The expected date of the commencement of the project was June 2007. In March 2009, discussions were still ongoing between the CCCO and UNEP on implementation modalities of the project.

8.2.1.1.3.3 Enforcement of regulations on the ODS control through training of customs officers enforcement

538. Originally, neither the IS nor training projects had a training component for customs officers. The regional workshops under the UNEP project on promotion compliance with the trade and license

[64] Decree No 501 of 11 June 2001 on the Application of the Law on Protection of Atmospheric Air

[65] Continued Institutional Strengthening Support for CEITs to meet the obligations of the Montreal Protocol in Kazakhstan, Tajikistan, Uzbekistan and Azerbaijan; GEF Project ID 3185;

provisions of the MP for 21 CEITs were supposed to provide training to ensure enforcement of regulations on the ODS control in Azerbaijan. Only limited number of enforcement personnel attended the above workshops, including the workshop in Baku in 2000.

539. Illegal trade in ODS has been estimated at approximately six tons in 1998[66]. It was apparent that borders could not be secured without training of customs officers working at border checkpoints. UNEP DTIE took corrective measures and allocated part of IS dedicated resources to organize the necessary training courses. The NOU played the active role putting the training programme on track.

540. Altogether 200 customs officers and representatives from other Government institutions concerned were trained at five training sessions organized by the NOU together with the State Customs Committee. The customs officials had been instructed on the implementation of the national import and export licensing system. The participants were also trained to work with the ODS identifiers to enable ODS to be identified in cylinders and equipment. The NOU produced brochures and books for the workshop that included: "*The Montreal Protocol and responsibilities of customs organizations*"; "*ODS imports/exports and licensing systems*"; and "*The implementation of the Montreal Protocol in Azerbaijan*". Most of the trained officers worked at the entry checkpoints.

541. However, the procurement of ODS identifiers was not included in the Project budget and, therefore, no equipment was purchased and distributed in those days. There was no continuation of training of customs officers to fill the gap due to high rotation of customs personnel. The training program for custom officers appeared to be insufficient to enforce the licensing system. Azerbaijan continued imports of CFCs and was recognized as being in non-compliance by the Implementation Committee until 2006. The CFC imports data provided by the SCC in 2002 and 2003 proved to be unreliable because of the misuse of customs codes.

542. In 2005, the representative of Azerbaijan informed the Implementation Committee[67] that the national customs authorities had been instructed to ban completely the import of ODS into the country in accordance with the Executive Order of the President. He stressed that the success of the ban would depend on the training of customs and other officials with respect to customs codes and other matters pertinent to identification of ODS, and said that his country required assistance with such training as well as funding assistance in connection with the recycling and reprocessing of ODS and compliance with the MP in general. The representative expressed reservations as to the NOU ability to enforce the ODS import ban given the existing lack of expertise in the tracking of ODS trade. The regular training of customs officers on ODS related issues was discontinued in the country. Due to the high rotation of personnel, the share of new untrained staff has increased. He advised also that Azerbaijan could not be certain as to the type and quantity of ODS entering the country, or the customs codes that were being used to record such trade. The discussions at the Implementation Committee meeting demonstrated that training of customs officers conducted by UNEP brought no positive results.

543. During the evaluation mission, the meeting was organized in the Central Laboratory of the SCC. The evaluator has been advised that in recent years the Laboratory was equipped with modern equipment. Recently, 13 "Neutronic Ultima ID" ODS detectors were purchased. All eleven checkpoints were equipped with the new detectors. The laboratory plans to purchase new identifiers capable of detecting components of HFC blends. It appears that currently the staff of the SCC and officers at checking points have been trained and provided with the necessary equipment in order to ensure the control of the illegal trade of ODS. The leadership of the SCC is well informed about the border security issues associated with ODS and committed.

544. The evaluator has been advised that in 2007, three mislabelled shipments of blends containing CFC-12 were intercepted by SCC. One hundred CFC-12 cylinders were seized from a ship in the Caspian Sea. The detained ODS were kept in the customs warehouse as there are no destruction facilities in the country. The SCC cooperated routinely with the World Customs Organisation.

---

[66] Study of Impacts of GEF Activities on Phase-Out of Ozone Depleting Substances (2000 GEF Evaluation Report)

[67] Implementation Committee under the Non-compliance procedure for the Montreal Protocol; Thirty-fifth meeting; Dakar, 7–9 December 2005

Recently, 10-digit codes were introduced enabling the identification of refrigerant blends. In 2007, codes were assigned to all the known new blends and reportedly, MENR was advised consequently. The CCCO, however, was not aware that new codes had been assigned. The Ozone Office continues to use six digit codes in its interaction with government entities concerned. It appears that there are communication problems between MENR and Customs authorities and within MENR on ODS-related issues. In spite of control measures undertaken by the Government CFC-12 refrigerant is still available on the market.

8.2.1.1.3.4 The NOU role in co-ordination and monitoring of ODS phase out activities

545. The implementation of investment projects by UNDP/UNOPS and non-investment activities by UNEP required the coordination by the NOU on three levels: a) among governmental institutions; b) among implementing agencies; and c) among national commercial enterprises. The preparation and promotion of Presidential decree on the licensing system of CFC imports required interaction with the Cabinet of Ministers and Governmental agencies concerned. The relatively short time (about 12 months) required to sign the Decree establishing the licensing system. This is an indicator of a good coordinating role of the NOU.

546. From the other hand, other drafts of legislative acts prepared by the NOU have never been passed through and adopted (such as regulation of imports of products and equipment containing ODS; introduction of qualification requirements in servicing refrigeration equipment; and regulations promoting proper storage, destruction and recycling of ODS). These factors pointed to the limited drafting capability, coordination and authority of the NOU in existed Governmental hierarchy.

547. The enforcement of the adopted ODS import licensing system relied upon close co-operation with the Cabinet of Ministers and in particular with the State Customs Committee and CFC consuming industries. The NOU managed to reduce the CFC consumption from about 100 ODP tonnes in 1999 to 12 ODP tonnes in 2001. However, the CFC consumption maintained and even increased for the following four years in defiance of early Government commitments that demonstrated the lack of coordination and access to decision makers on part of the NOU and its successor.

548. The timely completion of training of customs officers, training of refrigeration servicing technicians and investment projects at Chinar domestic refrigerator manufacturer, Sumgayit compressor manufacturer and Halon management and banking recovery and recycling centre demonstrate an important coordination role of the NOU. From the other hand, the CCCO representative could not provide reliable information to the Implementation Committee about enterprises consuming CFCs and the contribution of ODS recovery and recycling operations to the reduction of CFC consumption. The NOU failed to establish the professional refrigeration association that would have been very useful in collection of the required information and implementation of Government policies.

549. Currently, CCCO has virtually no contacts with stakeholders that participated in the GEF project in 2000 to 2002.

550. In conclusion, the NOU played an active coordination role in the implementation of the National Country Programme once the IS project was in force. This role has been seriously diminished after the closure of IS project. The coordination of timely allocation and disbursement of GEF resources, procurement and delivery of equipment by implementing agencies was beyond the control of the NOU.

8.2.1.1.3.5 The public awareness programme

551. The objectives of the awareness campaign were formulated in the institutional strengthening project as follows: 1) to increase consciousness of the general public through the mass media and NGOs; 2) to demonstrate and promote the strategy for the accelerated phase out by disseminating information on ODS-free technologies; 3) to develop an effective and efficient documentation centre and information Focal Point to disseminate information on ozone matters, both on request and via public awareness programmes.

552. During the three-year period many activities aimed at improvement of public awareness of ozone layer depletion were carried out. Reportedly, the NOO organized 24 awareness workshops

on the implementation of the MP in Azerbaijan in different regions for more than 1300 participants. The public has been informed about negative consequences for health and environment and about actions aimed at fulfillment of obligations under the Montreal Protocol, etc: Other activities undertaken include: 1) Workshops on public awareness on ozone issue in Azerbaijan, covered by National TV, and distributed printed material; 2) The content on the best children's drawing dedicated to the International Ozone Day; 3) Meetings with students of technical universities; 4) Meetings with the people involved in refrigeration and air conditioning; 5) Articles published in mass media; 6) Broadcasting via radio and TV shows; 6) The Regional Workshop on Implementation and Enforcement of ODS Import/Export Licensing Systems in Newly Independent States (NIS) held in Baku (June 2000); 7) Dissemination of the brochure about the Regional Workshops in Baku and Kiev; 8) Publishing scientific papers in the journal of *"Nature of Azerbaijan*"; 9) Publishing the information brochure *"Implementation of the Montreal Protocol in Azerbaijan for the Saving of Ozone Layer*"; 10) Publishing the information brochure "The Montreal Protocol and Duties of Customs Organizations"; 11) Publishing the pocket calendar "Save the Ozone Layer"; 12) Monthly NOU program on the national TV. The awareness activities were brought to minimum after the closure of the IS project in 2002.

553. The wide dissemination of information about ozone depleting issues contributed to expanded penetration of ODS-free equipment and its acceptance by the industry and general public. On the whole, the expected outcomes of the public awareness component have been achieved. UNEP project design did not include, a baseline and performance indicators to measure the benefits of the public awareness programme in terms of ODS reduction or otherwise.

8.2.1.1.3.6 The role of the NOU in promoting and adopting ODS-free substitute technologies by the industry and technical institutions

554. The NOU coordinated the promotion of ODS-free technology in the industry providing support to UNDP/UNOPS investment projects on conversion of the "Chinar" domestic refrigerator manufacturer and the Sumgayit compressor plant. The project at "Chinar" was aimed at the replacement of CFC-12 with HFC-134a refrigerant and conversion of CFC-11-based foam blowing operations to cyclopentane technology. The conversion of "Chinar" was accomplished in June 2001. With Swiss bilateral assistance, "Chinar" later installed an additional production line based on iso-butane refrigerant, that allowed this enterprise to implement hydrocarbon technology while the user demand arises. The project at Sumgayit compressor plant targeted the conversion of the manufacturing process enabling the enterprise to start production of HFC-134a-based compressors primarily for domestic market, including "Chinar" and refrigeration servicing industry. The technology selected by "Chinar" and "Sumgayit" was proven and used by many similar enterprises in both Article 5 and non-Article 5 countries.

555. The NOU established the line of communication between UNDP/UNOPS and their consultants and the management of two enterprises involved. The NOU in cooperation with the State Customs Committee enabled timely and tax-free delivery of manufacturing equipment "Chinar" and "Sumgayit". The certificates of completion have been signed by representatives of UNDP/UNOPS, the management of two enterprises and the NOU in June 2001 and March 2002 for "Chinar" and "Sumgayit" respectively. Both enterprises commenced production of new non-ODS-based products. Unfortunately, "Sumgait" failed to adapt to new economic situation on the market and went bankrupt. "Chinar" is still manufacturing domestic appliances for the local market. However, its annual output is only a fraction of the installed production capacity that makes its business perspectives not very promising.

556. The commercial refrigerator and insulation panel manufacturer "Titan" used HCFC-22 and CFC-11 as refrigerant and blowing agent at the time of the implementation of GEF Project in Azerbaijan. Reportedly, the disagreement in selection of replacement technology prevented this enterprise to be one of beneficiaries of the GEF Project. "Titan" continued the use of CFC-11 in its foam blowing operations until 2006 when it was replaced with HCFC-141b blowing agent. The continuing consumption of CFC-11 by "Titan" was one of the reasons behind Azerbaijan non-compliance and consideration of this issue by the Implementation Committee. More proactive role of the NOU could have brought the solution to this problem at the earlier stage.

557. The NOU played an important role in promotion of good servicing and recovery and recycling practices for reduction of CFC emissions into atmosphere. The NOU directly participated in the

introduction of legislation on banning imports of bulk ODS and intensive public awareness campaign that created conditions for market penetration of domestic and commercial refrigeration equipment, and A/C systems based on non-ODS alternative. The training of refrigeration servicing personnel in good servicing practices facilitated greatly in reduction of emissions of CFC refrigerants. Through the implementation of the recovery and recycling project, servicing shops were provided with modern and more efficient servicing equipment that was essential for refrigerant containment.

558. However, the system established by the NOU for monitoring R&R operations has not proved to be robust. Once the IS project was completed and the NOU ceased to exist, the successor CCCO could not provide information to the Implementation Committee on quantities of recovered and recycled CFCs. The existing Ozone Office has no information regarding the status of R&R activities in the refrigeration sector.

559. The NOU participated in establishment of the centralized national recovery/recycling and storage centre as of the National Halon Management Plan. The NOU interacted with the State Fire Department and facilitated in delivering halon recycling equipment. The co-operation has been stopped between two entities upon completion the project.

560. In conclusion, the NOU played an important role in adoption, promotion of new non-ODS based technology and equipment in the manufacturing, end-user, and servicing sectors but its efforts do not appear to be robust, comprehensive and sustainable.

8.2.1.1.3.7 The role of the NOU in collection of ODS related data and information exchange with other parties

561. The collection of ODS consumption data and reporting this data to national supervisory bodies and the Ozone Secretariat is the important task included in the terms of responsibilities of the NOU. The data officially reported under Article 7 of the Montreal Protocol to the Ozone Secretariat serve as a basis for determination of the compliance of the country with the Montreal Protocol phase-out schedule. The NOU coordinated input from two sources of ODS consumption data i.e. from State Committee on Statistics (SCS) that collected data from end-using enterprises and from the State Customs Committee (SCC) that registered ODS imports on customs terminals. There are no indications that the NOU received ODS import data directly from designated importer to double-check SCS and SCC data. The NOU provided regularly ODS consumption data to UNEP DTIE and the Ozone Secretariat in 2000 to 2002. UNDP and UNEP DTIE had no complaints in regard to timeliness and completeness of the NOU reporting.

562. Upon completion of the IS project, the successor CCCO continued reporting ODS consumption data to the Ozone Secretariat. Data submitted for 2001 to 2005 had shown consumption of CFCs in breach of Government commitments. The Implementation Committee (IC) sought further information from Azerbaijan. The representative of Azerbaijan attended all meetings of the IC and indicated to serious inconsistencies in earlier reported data. Thus based on the SCS information, CFC consumption in 2002, 2003 and 2004 was reported as 82.6 ODP tonnes, 76.4 ODP tonnes and 69.9 ODP tonnes. It came across later that the same custom code was used for reporting CFCs and HCFC-22. Similar confusion in codes was found in data provided by the SCC. The Azerbaijan records of CFC consumption for 2002, 2003, 2004 and 2005 had been corrected in the Ozone Secretariat in light of revised data provided by the CCCO.

563. The evaluator met with the representative of the SCC who clarified that the SCC cooperated routinely with the World Customs Organization in recent years. Lately, 10-digit codes were introduced enabling the identification of refrigerant blends. In 2007, codes were assigned to all the known new blends and MENR was advised accordingly. The CCCO, however, was not aware that new codes had been assigned. It suggests that communication is limited within MENR on ODS-related issues.

8.2.1.1.3.8 The role of the NOU in meeting compliance obligations

564. The NOU played a positive role in achieving benchmarks established by Decision X/20 (See Paragraph 6 above), in particular controlling the ODS consumption in the country. Halon imports were stopped in 1998. CFC consumption was reduced from 99.9 ODP tonnes in 1999 to 12.0 ODP tonnes in 2002, however, the results were short of the Government commitments to bring CFC

consumption to zero by 1 January 2001. Azerbaijan was recognized being in non-compliance in 2001 through to 2005. The targeted and actual CFC consumption is shown in Figure 13.

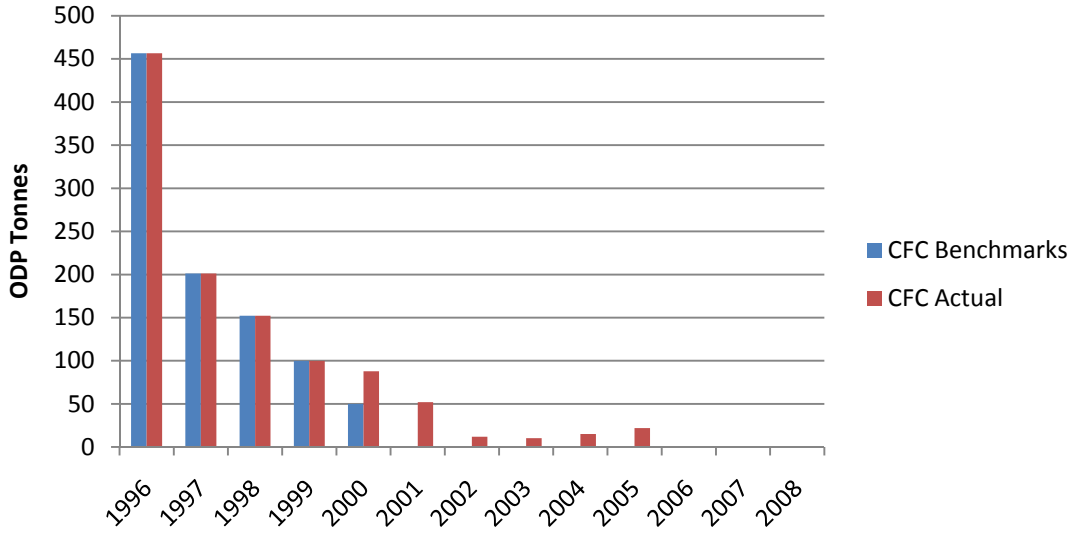


Figure 13: Country programme benchmarks and actual CFC consumption in Azerbaijan

565. The NOU facilitated the establishment of the CFC imports licensing system and enforcement mechanism. Unfortunately, the system has not proved to be sufficient and robust. Other commitments have not been met such as adoption of qualification requirements in refrigeration servicing industry, taxation of ODS imports and ban on imports of ODS containing equipment.

566. In conclusion, the following objectives have been fully or partially achieved:

- Established NOU and strengthened institutional capacity;
- Adopted legislation on ODS import/export licensing and quota system (partially effective);
- Availability of ODS-free technology and products;
- Introduction of ODS containment practices;
- Raised awareness;
- ODS phase-out (partially effective);
- Ratification of MP Amendments (partially effective);
- Reporting to UNEP, UNDP and OS (partially effective).

8.2.1.1.3.9 Relevance

567. The Table 1 and subsequent later sections show that outputs and outcomes of the IS project were in agreement with the Government strategy and priorities outlined in the country programme albeit not fully adequate.

568. Although the GEF is not linked formally to the Montreal Protocol, its strategy in the Ozone Layer Depletion Focal Area is an operational response to the Montreal Protocol. The strategic objective of the Focal Area is to protect human health and the environment by assisting countries in phasing out the consumption and production, and in preventing release of ODSs while enabling alternative technologies and practices according to countries' commitments under the Montreal Protocol. The expected long-term impact of the GEF interventions is to contribute to the return of the ozone layer to pre-1980 ozone levels, which is expected by 2065. The IS project in Azerbaijan fits the GEF strategy.

569. The link between ozone depleting chemicals and climate change has also increased dramatically in recent years with the recognition that many of ODS also have significant global warming

potential (GWP)[68] many hundreds to thousands of times greater than carbon dioxide. The GEF portfolio of ODS phase out project in CEITs and in Azerbaijan in particular, contributed to avoided GHG emissions. The project outcomes are, therefore, consistent with and contributed to the objectives of GEF Ozone Layer Depletion and Climate Change Focal Areas and respective operating strategies.

8.2.1.1.3.10 Efficiency

570. It is problematic to assess the cost-effectiveness of the IS project in terms of US$/kg ODP. However, from analysis of outcomes versus inputs, one can conclude that the project was cost-effective. The NOU activities facilitated reduction of CFC consumption from about 100 ODP tonnes in 1999 to 12.0 ODP tonnes in 2002. The objectives of project could have been met in a more comprehensive way had the GEF assistance would be extended. Once the GEF financing was exhausted, the support of the NOU from the Government stopped and was resumed in a year time at a very modest and insufficient level. The IS extension project with the financial assistance attached was approved by the GEF Council in 2007 but the adequate operation of the NOU yet to be resumed.

8.2.1.1.4 Assessment of Sustainability of project outcomes

8.2.1.1.4.1 Financial resources

571. The NOU was staffed with 5 permanent positions and temporary consultants. In June 2002, the IS project was completed, the terminal report submitted to UNEP DTIE and GEF funding stopped. Later in 2002, all the UNDP investment projects had also been completed and the NOU was dissolved. The ODS related activities virtually stopped in Azerbaijan. In a year time, CCCO was established in the Hydrometeorological Service. The head of CCCO was assigned with responsibilities to deal with ozone related issues. The budget of the CCCO did not allow for the employment of consultants. Due to very limited resources and the lack of required expertise, the scope of its activities was limited to reporting of Article 7 data to the Ozone Secretariat and interacting with the Implementation Committee on non-compliance issues. In the absence of the Refrigeration Association, the continuation of ODS phase out activities in the refrigeration servicing sector was not viable. In 2007, the GEF funding for the extension of IS activities was approved in four CEITs, including Azerbaijan. The allocated resources have not been disbursed to Azerbaijan yet.

8.2.1.1.4.2 Socio-political and institutional framework and governance

572. Socio-political sustainability is directly related to the level of Government commitment to the institutional support and the adoption and enforcement of the legislation restricting imports of ODS in bulk and equipment containing ODS. The Government support of ODS related activities remains extremely modest that resulted in frequent rotation at the junior post of the ozone officer in CCCO. The recently appointed officer has no previous ODS related experience and is subjected to communication problems. The licensing and quota system approved in 2000 with the NOU support was not effective. The additional Presidential Decree was approved in March 2006 that banned imports of CFCs. Since then, no legislative activities have been undertaken to further enforce the sustainability of the Project and meet Government commitments, including adoption of qualification requirements in refrigeration servicing industry, taxation of ODS imports and ban on imports of ODS containing equipment, and introduction of mandatory ODS recovery and recycling practices.

573. The 2000 legislation was enforced by training of customs officers. The UNEP training programme did not prove to be successful. The procurement of CFC identifiers was not envisaged by the IS project that impaired customs border control capabilities. In recent years, the SCC obtained the necessary equipment and provided it to border checking points and terminals together with adequate training.

574. On part of CCCO, there were no centralized efforts to organize the continuation of training of refrigeration servicing personnel. Reportedly, the training module covering ODS issues was

[68] Global warming potential is a measure of how much a given mass of greenhouse gas is estimated to contribute to global warming. It is a relative scale which compares a gas in question to that of the same mass of CO2 (whose GWP is 1).

introduced into curriculum of the local Polytechnic Institute. However, CCCO has no information about the impact of this undertaking. The refrigeration association does not exist that could arrange the training of refrigeration technicians on the commercial basis. The sustainability of the project was undermined also by the absence of monitoring of ODS recovery and recycling activities. This is an area where the refrigeration association would have played an important role. It appears that the Government could play more proactive role in creating conditions for the stronger sustainability of project outcomes.

8.2.1.1.4.3 Environmental

575. In spite of massive replacement of CFC-based refrigeration end-user equipment, the risk of illegal trade still remains in Azerbaijan because of the continuous demand for CFC-12 for servicing old refrigeration equipment. The role of recovery and recycling programme is not known since data on the recovered quantity of CFC-12 are not available. The evaluator has been advised while visiting the SCC that in 2007, three mislabelled shipments of blends containing CFC-12 were intercepted by SCC. One hundred CFC-12 cylinders were seized from a ship in the Caspian Sea. The detained ODS were kept in the customs warehouse as there are no destruction facilities in the country. The Government, the CCCO and the State Customs Committee should undertake concerted efforts to maintain and enforce the environmental sustainability of the project.

8.2.1.1.5 Achievement of outputs and activities

576. The achievement of outputs and activities is analysed in *the section Attainment of objectives and planned results: Effectiveness*. Not all outputs were achieved. The implemented outputs and activities created a basis for Halons and CFC phase out by 1997 and 2006 respectively.

8.2.1.1.6 Catalytic role

577. The catalytic role of the IS project can be traced through increased penetration of new non-ODS refrigeration end-user equipment. It is difficult to differentiate between market forces and the effect of legal Government measures restricting ODS supply, training programme and the awareness-raising component. The wide dissemination of information about the threats to the ozone layer contributed in promoting ODS-free equipment and its acceptance by the general public. The IS project had an influence on the attitude of companies and servicing technicians in the refrigeration and air-conditioning sector. Those who received training under the project apply good practices in servicing the refrigeration equipment and transmit this knowledge to new generation of servicing personnel.

8.2.1.1.7 Assessment of Monitoring and Evaluation Systems

8.2.1.1.7.1 M&E design

578. The evaluators had limited capabilities in investigating the monitoring and evaluation systems applied in the course of the implementation of the IS project in Azerbaijan. On UNEP side, the project was managed by DTIE office in Paris. Originally, the evaluation team was scheduled to visit DTIE Headquarters in Paris to get acquainted with the project documentation, including progress reports and to be briefed by UNEP DTIE staff members involved in management of the GEF portfolio in CEITs. However, this visit did not materialise. Later, the head of DTIE Ozone Action Branch in Paris office advised the evaluation team that all the archived documents related to GEF ozone portfolio in CEITs were discarded. The evaluation team had a short briefing session with the GEF Task Manager (TM) in Geneva during the 29th Meeting of OEWG in July 2009. UNDP provided the evaluation team with the Project Implementation Reports (PIR) presented to the GEF Secretariat in 2002. The assessment of monitoring and evaluation system is based on the analysis of the UNDP PIR, mid-term evaluation report and interviews with the CCCO staff.

579. The mid-term evaluators had the opportunity working with UNEP DTIE staff and relevant documentation in Paris in 2004. The six-month progress reports and annual Article 7 data reported to the Ozone Secretariat were the major monitoring tools for UNEP DTIE to measure the progress. The Mid-term Evaluation Report (MER) identified shortcomings of the M&E system design, in particular, the report called to review and determine the adequacy of Performance Indicators (PIs) where they exist and assign PIs where they did not exist. The

Report recognized also the lack of result-based management and accountability framework.[69]

580. The IS project document and UNDP PIR indicate that the design of the Azerbaijan institutional strengthening project was not reflective of state-of-the-art project management practices. The UNDP PIR did not address the benchmarks in the Country Programme and Decision X/20 as targets and performance indicators and country accountability for sustaining results achieved. The UNDP PIR contains a few quantitative indicators as the necessary monitoring tools but there is no assessment and rating of progress in regard to project outputs, internal and external risk identification and rating and description of project implementation monitoring, experience and lessons learned.

8.2.1.1.7.2 M&E plan implementation

581. According to the Mid-term Evaluation Report, the ozone office carried out monitoring of consumption of ODS based on permits issued to importers by the State Committee of Ecology and on the data provided the State Customs Committee on import/export of ODS. The enterprises that received the recovery and recycling equipment reported quarterly to the NOU on quantities of recovered and recycled ODS and the use of alternative non-ODS refrigerants. The provincial ecological authorities were also involved in collecting data on consumption, and recovered and recycled ODS. The NOU capacity was sufficient to meet the annual reporting requirements as per Article 7 of the MP. Reportedly, the NOU progress reports had been submitted to UNEP DTIE at time and of adequate quality. Reports on consumption of ODS in 2000 and 2001 have been prepared and submitted timely to the Ozone Secretariat UNEP.

582. Upon completion of the IS project in 2002, M&E activities were stopped on the part of UNEP DTIE. Inasmuch as Azerbaijan reported its CFC consumption in 2001 and 2002, the Implementation Committee initiated the regular monitoring of the non-compliance situation in Azerbaijan in accordance with Decision X/20 starting from its 31st Meeting (November 2003). The CCCO was interacting with the Implementation Committee on the issue of non-compliance until 2006 when the Presidential decree was adopted and CFC imports finally stopped in Azerbaijan. As indicated above, the CCCO experienced difficulties in collecting and presenting objective CFC consumption data.

8.2.1.1.7.3 Budgeting and Funding for M&E activities

583. The internal monitoring of ODS phase out activities by the NOU staff and local consultants was covered from the budget of the IS project. The monitoring functions were part of working responsibilities of UNEP DTIE. The IS project budget included the budget line "UNEP Participation" amounting to $21,000 for three years. The budget envisaged costs of services of consultants and travel, miscellaneous for technical assistance, monitoring and evaluation of project. The evaluation team had no access to financial documents of UNEP DTIE to investigate this issue further.

8.2.1.1.7.4 Long-term Monitoring

584. The Government continues fulfilling requirements of the Montreal Protocol reporting ODS consumption data to the Ozone Secretariat in accordance with Article 7 of the Montreal Protocol and its amendments. The CCCO is monitoring ODS consumption in the country by correspondence with Governmental agencies concerned mainly relying upon information provided by the State Customs Committee.

8.2.1.1.8 Assessment of processes that affected attainment of project results

8.2.1.1.8.1 Preparation and readiness

585. The GEF intervention in CEITs addressing the ODS phase out issues was based in great extent on the experience gained by the Multilateral Fund and its implementing agencies (UNEP, UNDP, World Bank, UNIDO) in Article 5 countries. The GEF intervention in Azerbaijan followed the strategy that proved to be successful in many Article 5 countries i.e. as a first step, preparation the country programme with direct involvement of the Government and other stakeholders concerned and the Refrigerant Management Plant. The preparation of these strategic

[69] Mid-term evaluation report 4 July 2004, Victor Buxton and Risto Ciconkov

586. Yet, the significant difference exists in institutional support to NOUs created in CEITs by GEF and Article 5 countries by MLF. The initial training to NOU in CEITs was provided at series of regional workshops organised by UNEP. Such an approach does not ensure the continuity of expertise in case of rotation of personnel in NOUs and its sustainability. The MLF created a networking system of Article 5 NOUs in each geographical region, including the East European and Central Asia (EECA) network. The network meetings have been carrying out on an annual basis. Each network is supported by a regional office established under UNEP Compliance Assistance Program (CAP). The networking system and CAP, among other, allow for providing timely assistance to newly appointed NOU personnel. As a non-Article 5 country, Azerbaijan did not participate in EECA Network.

8.2.1.1.8.2 Country commitment

587. The country commitment to ozone international treaties was manifested by the fact that the Republic Azerbaijan ratified the Vienna Convention and the Montreal Protocol, including its London and Copenhagen Amendments on 12 June 1996 and Montreal Amendments on 28 September 2000. The ODS Phase out Country Programme (CP) that was elaborated with the assistance of UNEP and UNDP and approved by the Government of Azerbaijan in January 1998 became the major tool to address ODS related issues in the country. Several key components have been were identified that characterize the Government commitments in several specific areas: support to the NOU and to IS project, legislation (including Montreal Protocol compliance); customs and border security; training of refrigeration servicing technicians; recovery and recycling programs and investment projects in the refrigeration industry.

588. The State Committee of Ecology and Nature Management Control (SCENMC) that later transformed into the Ministry of Ecology and Natural Resources (MENR) was designated as the agency responsible for the implementation of the Country Programme. The Chairman of the SCENM was the project manager of all ODS related activities. Throughout the three year duration of the IS project, the Government achieved some positive results: the NOU was established and became fully operational, the legislation was approved facilitating the substantial reduction in CFC imports and border control; UNEP and UNDP/UNOPS sub-projects were completed in time.

589. Not all the commitments were met as identified in the CP and Decision X/20, in particular, the country was in the state of non-compliance until 2006. There were plans to implement further improvement in legislative provisions related the MP; to ratify the Beijing Amendment; to introduce certification scheme for companies and service technicians in refrigeration sector; to continue training and dissemination of information in R/AC sector; to continue public awareness activities.

590. However, inadequate financing of the NOU (CCCO) prevented the implementation of these plans that demonstrate the lack of commitments on the part of the Government.

8.2.1.1.8.3 Stakeholder involvement

591. The implementation of National ODS Phase out Programme and GEF funded activities required interaction of the NOU and MENR with a number of national stakeholders, including the Administration of the President, the Legal Department of the Cabinet of Ministers, the State Customs Committee, the State Committee on Statistics, Ministry of Economy, Ministry of Foreign Affairs, Ministry of Internal Affairs (Halon project) State Committee on TV and Radio Broadcasting, Ministry of Education. The NOU was in close interaction with refrigeration servicing enterprises involved in training and recovery/recycling projects. The NOU coordinated the implementation of two industry investment conversion projects in “Chinar” and “Sumgayit” that required the regular NOU communication with UNDP/UNOPS and their consultants, local

592.

593. The broad participation of governmental agencies throughout the active existence of the NOU showed a sense of project ownership. The scope of responsibilities of the CCCO has been narrowed down to reporting of Article 7 data in recent years. Respectively, the interaction with stakeholders has been substantially reduced and has been done mainly through the correspondence indicating the lower level of country ownership and commitments.

594. The current structure of the Ministry of Ecology and Natural Resources can be found in the Ministry website[70].

8.2.1.1.8.4 Financial planning

595. The financial planning and control were exercised by the UNEP DTIE. The allocation of cash was based on the review of quarterly and semi-annual progress reports, expenditure reports, plans of future actions and requests for cash advances prepared by the NOU. The monies have been transferred to the NOU through local UNDP office in Baku. Reportedly, the NOU activities and accounting were subject to regular national financial auditing on an annual basis. Copies of the audit reports were forwarded to UNEP. The evaluation team has not been provided with the access to financial planning and reporting documents and, therefore, is not in a position to comment on the appropriateness of financial planning standards applied by UNEP and UNDP.

596. The extension of the IS project in Azerbaijan was approved in 2007 by GEF. However, the start up of the new project has experienced significant delays. No allocated resources have been disbursed yet.

8.2.1.1.8.5 UNEP / UNDP Supervision and backstopping

597. UNEP was a lead agency in the country program preparation and in implementation of institutional strengthening and capacity building, awareness raising and training activities. UNEP DTIE was a responsible supervising organization since the inception of the NOU in 2000 until 2002. The supervision was conducted through reviewing the regular quarterly and semi-annual reports provided by the NOU to the UNEP DTIE. The mid-term evaluation report indicates that the NOU experienced no problems in its interactions with the UNEP Paris office. No information is available about supervisory missions of UNEP staff to Azerbaijan during the project.

598. UNDP was responsible for formulation and implementation of investment sub-projects with the private sector involving the United Nations Office for Project Services (UNOPS) for procurement and project management that relied mainly on international consultants. UNDP engaged widely international consultants for the supervision of the implementation of investment activities and its country office that provided interactions with the Government and also served as a financial institution supporting UNDP investment and UNEPs institutional strengthening and training components. Reportedly, the NOU had no complaints regarding the local UNDP office as a financial intermediary.

8.2.1.1.8.6 Co-financing and Project Outcomes & Sustainability

599. The Government assessed its co-financing of the IS project amounting to $36,000 (in-kind) for three years that covered the office space, local telephone, office furniture, and local travel. A part time assistance was also provided by the Ministry personnel. Reporting of in-kind co-financing was not a part of the original project reporting. There have been no official lists of leveraged resources for the projects of the Ozone portfolio, as this was never mandatory for Ozone projects.

600. The current level of the Government contribution on the annual basis can be assessed as one third of the declared contribution to the IS project ($12,000) plus the annual salary of a junior ozone officer (about $1,500) with a total of $13,500. This estimated value represents about 13% of the annual budget of the IS project. This limited budget was not sufficient to ensure the

[70] http://www.eco.gov.az/nazirlik-struktur.php

sustainability of the results achieved in the implementation of the ODS phase out project and for further development and enforcement of legislation, continuation of public awareness and training programme, monitoring of recovery and recycling operations, and the halon bank management. The delay in provision of funds by UNEP DGEF to the NOU further put at risk the outcomes of the IS project achieved.

8.2.1.1.8.7 Delays and Project Outcomes & Sustainability

601. The implementation of investment and training components was completed as planned in 2001. The IS project was accomplished in June 2002 by submitting the NOU terminal report to UNEP DTIE. There were no delays in implementation schedules of UNEP and UNDP/UNOPS projects. The threats to sustainability of outcomes have been instigated by inadequate Government commitments and serious delays in the implementation of the IS extension project.

8.2.1.1.9 Project ratings

602. The ratings of the IS project have been performed according to categories and criteria specified in Annex 1 of the Terms of Reference of the evaluation. The ratings are presented in Table 23.

Table 23: Project ratings for the Institutional Strengthening project in Azerbaijan

Criterion	Evaluator's Summary Comments	Rating
Attainment of project objectives and results (overall rating)	Not all the project objectives were attained. The country was in non-compliance until 2006.	**MS**
Effectiveness	The most of project objectives were fully or partially achieved. The Government and NOU have not been successful in promotion and adoption a number of regulations committed in the Country Programme and included in Decision X/20. In particular, complete phase out of CFC consumption was not achieved by 1 January 2001.	**MS**
Relevance	All project outcomes are fully consistent with GEF strategy in ozone and climate focal areas and Government priorities.	**HS**
Efficiency	The objectives achieved in relation to costs and the time make the IS project relatively effective. The objectives of project could have been met in a more comprehensive way had the GEF assistance would be timely extended.	**MS**
Sustainability of Project outcomes (overall rating)	The disruption in GEF financing of the NOU put the sustainability of project outcomes at risk	**ML**
Financial	The GEF financing of the NOU stopped in 2003. The Government financial commitments were very limited. The scope of activities of the NOU has been substantially reduced. The GEF IS extension was approved in 2007 but the funding has not resumed yet.	**ML**
Socio Political	Government commitments, legislative and enforcement measures did not prove to be sufficient enough to maintain and enforce the sustainability of project outcomes.	**ML**
Institutional framework	The institutional capacity created by the	**ML**

Criterion	Evaluator's Summary Comments	Rating
and governance	Project was lost and Government commitments did not ensure the institutional sustainability and governance. The project management was not adaptable to inadequate Government support of the NOU to ensure sustainability of outcomes.	
Environmental	The target of zero CFC consumption was moved from 2001 to 2006. There is still demand for ODS refrigerant and, respectively, a risk of ODS illegal trade.	**ML**
Achievement of outputs and activities	Most of outputs were achieved fully or partially. The implemented outputs and activities created a base for attaining objectives and meeting planned outcomes. However, not all outcomes were met.	**MS**
Monitoring and Evaluation (overall rating)	The design of the IS project is not reflective of state-of-the-art project management. Reportedly, the implementation of M&E plan was good quality.	**MS**
M&E Design	The design of the IS project is not reflective of state-of-the-art project management practices and lacking of result-based management and accountability framework. Risk analysis was also not a part of project design.	**MU**
M&E Plan Implementation (use for adaptive management)	The NOU capacity was sufficient to carry out monitoring and reporting activities in 2000 to 2001. No supervisory and monitoring visits were mounted by UNEP. Upon completion of the IS project in 2002, M&E activities were stopped on the part of UNEP DTIE. The Implementtion Committee conducted the regular monitoring of the non-compliance situation in Azerbaijan until 2006. The capacity of CCCO was insufficient to provide reliable Article 7 data.	**MS**
Budgeting and Funding for M&E activities	The internal monitoring of ODS phase out activities by the NOU staff and local consultants was covered from the budget of the IS project.	**MS**
Catalytic Role	The catalytic role of the IS project can be traced through increased penetration of new non-ODS refrigeration end-user equipment and the use of good servicing practices.	No ratings are requested for the catalytic role.
Preparation and readiness	The project document was associated with the country programme approved by the Government. The project design did not contemplate originally the training of customs officers and procurement of ODS identifiers.	**MS**
Country ownership /	The Government demonstrated the	**MS**

Criterion	Evaluator's Summary Comments	Rating
commitment	appropriate level of commitments and ownership in the course of implementation of the IS project. Not all the commitments were met as identified in the CP and Decision X/20, in particular, the country was in the state of non-compliance until 2006.	
Stakeholders involvement	The project involved all relevant stakeholders in project preparation and execution. The level of participation was reduced once the IS project was over.	**MS**
Financial planning	The project had no serious shortcomings in flow of funds. No financing was originally allowed for training of customs officers. The necessary corrections were done at the later stage. No resources were allocated in the budget for procurement of ODS identifiers that impaired customs ability to secure borders. The extension of the IS project in Azerbaijan was approved in 2007 by GEF. The start up of the new project has experienced significant delays. No allocated resources have been disbursed yet.	**MS**
UNEP Supervision and backstopping	In general, UNEP fulfilled its role of the supervisory agency. No supervisory missions were undertaken to the country.	**MS**
Overall Rating	Not all the objectives of the project were met.	**MS**

8.2.1.2 GF/4040-02-04 – Training of trainers for use of ODS-free refrigerants;

8.2.1.2.1 Background

603. UNEP and UNDP in close co-operation with the Government prepared the National ODS Phase out Programme and the Refrigeration Management Plan (RMP) using the 1996 ODS consumption as the baseline. The total 1996 ODS consumption was 957.7 ODP tonnes, including 456.5 ODP tonnes of CFC and 501.2 ODP tonnes of halons. The CFC consumption was subdivided between refrigeration manufacturing sector (about 115 ODP tonnes) and servicing sector (about 340 ODP tonnes). The ODS phase out in the refrigeration servicing sector requires a systematic approach based on a comprehensive, multi-faceted strategy aiming at establishing the proper sequencing of projects and policies that proceed in a coordinated way. Such strategy was reflected in the Refrigeration Management Plan (RMP) developed by UNDP. The training of technician in good practices is part of the RMP. The survey identified about 460 repair workshops with 1100 servicing technicians. It was anticipated that the introduction of good servicing practices and maintenance would result in reduction of CFC refrigerant consumption and emissions. The project had no specific benchmark in terms of ODP tonnes phase out.

8.2.1.2.2 Attainment of objectives and planned results

8.2.1.2.2.1 Objectives, outputs, outcomes and performance indicators

604. The objectives of the project are to provide technical information and demonstrate procedures and practices to refrigeration servicing technicians improving service and maintenance practices in order to prevent intentional and/or unintentional emissions of ODS into the atmosphere and to extend the useful life-time of the refrigeration equipment. The design of the UNEP project for Azerbaijan did not require clearly defined logframe analysis and prior agreed performance indicators (PIs) at the time of their formulation and approval. The 2004 Mid-Term Review undertaken for the UNEP-managed projects identified the issue of the absence of results-based

management and accountability framework, including the lack of PIs in the UNEP sub-projects. In the absence of these PIs, project outputs and outcomes and PIs were developed for this Terminal Evaluation Assessment, based on the results of the mid-term evaluation, the UNEP PIRs and achievements that became evident during the assessment of each of the sub-projects (Table 24).

Table 24: Azerbaijan Training Project - Objectives/ Intended Results - Outputs/Deliverables - Outcomes/Performance indicators

Objectives/Intended Results	Outputs/Deliverables	Outcomes/Performance indicators
1. Training of adequate number of local trainers in good servicing practices to reduce ODS emissions.	1. Procurement and delivery of training equipment; 2. Establishing a training center; 3. Development and translation of training curricula and manuals; 4. Conducting Train-the-Trainer Workshops (Phase 1); 5. Certification of trainers ;	1. Availability of adequate number of local trainers. Time required by UNEP to disburse GEF funding; Timely establishment and availability of equipped training center; Availability of training materials in the training process; Number of certified trainers (90);
2. Training of refrigeration technicians in good servicing practices to reduce ODS emissions.	6. Establishing regional training centers equipped with training equipment; 7. Compilation of lists of participants and training schedule. 8. Dissemination of training material among servicing companies and individual technicians around the country. 9. Conducting training workshops for servicing	2. Introduction of good servicing practices into routine operation of servicing network and reduction ODS emissions. Availability of functioning training centers; Number of months elapsed since training-the –trainers workshop; Number of trained and certified technicians (1100); Evidence of application of received knowledge in practical work; Evidence of availability of modern servicing tools and equipment; 3. Contribution to meeting the ODS phase-out schedule. Reduction in ODS emissions due to introduction of good servicing

Objectives/Intended Results	Outputs/Deliverables	Outcomes/Performance indicators
	technicians (Phase 2); 10. Organizing testing and certification of trainees;	practices by 20%;
3. To ensure the continuation of training activities upon completion of the project.	11. Introduction of ODS related curricula into training programmes of technical universities and vocational schools. 12. Continuation of hands-on training in refrigeration servicing industry. 13. Development and promotion of a regulatory framework for the refrigeration sector which will enforce good maintenance and servicing practices.	4. Growing availability of graduates from technical universities and vocational schools trained to handle ODS issues. Number of graduates trained annually; Number of technicians receiving hands-on training and certified annually. 5. Introduction of regulations on qualifications requirements for refrigeration servicing personnel.

8.2.1.2.2.2 Effectiveness

605. The GEF funds amounting to $114,900 were provided to UNEP for *Training the Trainers in Refrigeration* in accordance with the project document in May 1999. This date can be considered as the start of the project. The funds approved covered fees and travel costs for an international consultant, fees for a local consultant, adaptation and translation of technical materials, office supplies, workshop costs for both initial and subsequent training events, simultaneous translation for the workshops, and travel and DSA for non-local participation at the workshop (participants from other cities in Azerbaijan). The budget also included funding to cover the costs of the participation of UNEP in the project, including assistance to the Government of Azerbaijan and monitoring and evaluation of the project. The training component was implemented by UNEP in co-operation with the UNDP country office. Shortly after the approval of the project document funding was disbursed to the NOU through the UNDP local office.

606. The Ozone Officer interviewed by the evaluator had no information on the implementation of the training project in 2000 -2002. The milestones and outcomes of the UNEP training project have been mainly obtained from the project document, 2004 UNEP Mid-term Evaluation Report and 2002 UNDP PIR.

607. Reportedly, the NOU undertook important preparatory activities to start off the training courses as planned. The training centre was established and furnished with training equipment. The NOU Coordinator and his assistant officer being refrigeration engineers prepared training modules for both service technicians and engineers using the UNEP Training Manual on "Good Practices in Refrigeration" as a resource document. The NOU interacted with Technical University and major refrigeration servicing companies and compiled the list of participants for

the train-the-trainer course. The train-the-trainers workshop as Phase I was held in May 2000 in Baku after twelve months elapsed from the time of approval of the training project. The international consultant from Germany conducted the workshop. Altogether, 90 refrigeration engineers and technicians were trained and provided with certificates that corresponded to the number of trainers targeted in the Project Document. The training material was translated into Azeri and provided to every participant.

608. The training module covered all the elements of good servicing practices, including: theory of ozone depletion; provisions of the Montreal Protocol; basics of refrigeration science; servicing and maintenance practices for ODS-containing refrigeration equipment; new alternative refrigerants and retrofitting procedures; leak detection and prevention; government ODS phase-out regulations relevant to the refrigeration sector. The training module contained initial information on recovery and recycling operations in coordination with UNDP recovery and recycling project. .

609. The Phase II training of service technicians was followed. The NOU interacted with two major servicing companies having branches in the regions and composed the database of enterprises and individual participants. The NOU prepared the "National Code of Good Practice" in the refrigeration and air-conditioning sector using Canadian "Guidebook for Implementation of Codes of Good Practice in the Refrigeration Sector" and other documents as source documents. The training manual on 70 pages was compiled using the basic sections of the “National Code” and distributed among the participants. In total, 32 training workshops were organized in all major regions of the country within twelve months from November 2000 to October 2001 involving 1011 service technicians. Those graduates who passed the test were provided with certificates. The targeted number was 1,100 of trained technicians. Yet, the unknown number of unregistered technicians was not covered by the training programme.

610. Additionally, training on refrigerant recovery and recycling, and good repair and maintenance practices was provided by UNDP in July 2001. This training component will be discussed under AZE/98/G33- Recovery and recycling of ODS refrigerants in the air-conditioning and refrigeration sector.

611. It appears that UNEP DTIE and the NOU undertook timely the necessary activities for the training of trainers and servicing technicians and almost met the established target in terms of the number of trainees. The application of good servicing practices requires the availability of modern servicing equipment and tools. The budget of the training project did not contain provisions for procurement of such equipment and tools. About 300 kits of the servicing equipment tailored for servicing and refrigerant recovery operations were purchased and distributed under UNDP recovery and recycling project together with recovery and recycling machines and other equipment. It was not possible, however, to ascertain to what extent the trained servicing personnel had been equipped with the adequate servicing equipment in order to apply effectively good servicing practices. The Mid-term Evaluation Report and other available documents do not provide the relevant information on this issue. The CCCO Ozone Office did not carry out any monitoring of servicing enterprises for the last six years and failed to organize visits to enterprises benefited from the project.

612. In 2000, the training module related to the MP and ozone issues was included into the curricula of the State Technical University of Azerbaijan. The available documentation contains no information on the number of graduates received the relevant training. The CCCO Ozone Office has no information on the current status of training activities in technical universities and vocational schools in regard to the MP and ozone issues.

613. One of the major objectives of the training project was to reduce the demand for CFC refrigerants in servicing operations dealing with CFC-based equipment. Some servicing shops flushed the system with CFCs to eliminate the air from the system, and then vented the flushed CFC into the atmosphere prior to final charging. Apparently, the training and provision of vacuum pumps and introducing nitrogen for flushing stopped the bad practices of CFC venting that was earlier considered as a norm. The quality of repair work has also improved bringing about a reduced leakage rate in serviced equipment. It appears that good servicing practices have been introduced into routine operation of servicing network and the outcomes of the training component were achieved resulting in certain reduction of ODS emissions.

614. The project document contains no specific target for the reduction of the national CFC consumption in terms of ODP tonnes. The project document indicated that the demand in CFCs for servicing could be reduced by about 20%. As a result of the project. The national consumption in Azerbaijan had been reduced from 87.8 ODP tonnes in 2000 to zero in 2006. There is no data available that could establish quantitatively the contribution of the training project into the reduction and eventual phase out of CFC consumption in the refrigeration servicing sector in Azerbaijan. In general, notwithstanding the fact that UNEP conducted numerous training projects for refrigeration servicing personnel in CEITs and Article 5 countries there is no methodology available for determining the impact of these projects in quantitative terms.

615. The NOU commenced the work on development of the national code of good practices in the refrigeration servicing industry that should have culminated in the adoption of the legislation requiring mandatory qualification of servicing personnel. Unfortunately, this work was not continued after the NOU was dissolved due to the termination of the IS project.

616. In recent decade, the domestic and commercial refrigeration and air-conditioning sector underwent a serious transformation adjusting to new economic realities. Currently, there are several well established companies in Azerbaijan that involved in distribution, assembling and servicing of modern refrigeration and air-conditioning equipment based on HCFC-22 and HFC refrigerants. “Titan Group” is one of them that was visited by the evaluator. The company has its training programme that keeps update the knowledge and skills of its servicing personnel responding to the demand of the market. The company does not deal with servicing of old CFC equipment that apparently yet exists in the country. Reportedly, there are less sophisticated refrigeration servicing companies and individual unregistered servicemen dealing with CFC-based equipment. Unfortunately, the CCCO Ozone Office does not have any database of such companies and failed to organize a working visit to one of them.

8.2.1.2.2.3 Relevance

617. The Table 4 shows the relationship between inputs, outputs and outcomes. The outcomes of the training component are fully in agreement with the strategy and priorities outlined in the country programme. The training component being part and parcel of the ODS phase out programme is fully consistent with the G EF ozone focal area.

8.2.1.2.2.4 Efficiency

618. The ODS phase out target of the training component was not clearly established in the UNEP project document. There was an indication that the training program might reduce the CFC consumption in servicing by 20%. The CFC consumption was reduced from 87.8 ODP tonnes to zero in 2006. It is not possible, however, to assess a share of a reduction in CFC consumption due to training of the refrigeration servicing personnel. There is no methodology to verify the impact of training in terms of ODP tonnes phased out.

619. The number of trained technicians (1033) almost matched the target established in the project document (1100). The efficiency can be assessed by subdividing the total cost of the training component ($ 114,900) by the number of trainees. The cost-effectiveness would be about $ 111 per a trainee that is a quite good value.

620. The preparation and Phase 1 and Phase 2 training activities have been accomplished within 25 months that was according to the established time line and demonstrated a good efficiency of the implementation.

8.2.1.2.3 Assessment of Sustainability of project outcomes

8.2.1.2.3.1 Financial resources

621. Once the training programme was completed and the project was terminated in 2002 there was no financing specifically provided by the Government to continue and expand the training activities in the refrigeration servicing industry.

8.2.1.2.3.2 Socio-political

622. The Government commitments to continue the ODS phase out training activities were not very

strong. The well-established refrigeration companies continue training programmes using their own resources in order to maintain their commercial and business interests. These activities, however, have not been monitored and centrally supported. Apparently, there are small servicing businesses that have not been fully covered by the UNEP project. It appears that currently these businesses and individual entrepreneurs do not have access to any training facilities**.** Lack of training of refrigeration technicians on new refrigeration technologies and alternative increased the risk of unskilled technicians entering the workforce. The adoption of the legislation requiring mandatory qualification of servicing personnel could be a strong stimulus for continuation of the training. This piece of legislation is yet to be developed and approved by the Government. Absence of legislation that requires refrigeration technicians to be certified increased the risk of bad practices in refrigerant servicing and increased the risk of emissions and illegal trade.

8.2.1.2.3.3 Institutional framework and governance

623. The major outcome of the training programme is in the creation of a core of trained personnel that has a capability to pass on their knowledge, skills and experience. The sustainability of this process depends on the availability of a sufficient institutional framework. The CCCO established in 2003 had very limited capacity and resources, and no mandate in monitoring and continuation of training activities in the refrigeration sector. The refrigeration association was not established. This organisation could play a very important role in dissemination of knowledge among the refrigeration community. The ODS related curriculum was introduced in the local technical university in 2002. However, the Ozone Office has no information on the current status of the ODS related training programme.

8.2.1.2.3.4 Environmental

624. The training of more than a thousand of servicing technicians had a very positive impact on the containment and reduction of emissions of CFCs into atmosphere. The CFC refrigerants still present on the market. The risk of non-controlled use of CFCs exists due to the lack of centrally coordinated continuation of training activities.

625. In conclusion, the sustainability of the outcomes of the UNEP training project is uncertain.

8.2.1.2.4 Catalytic role

626. The project has a certain replication effect. The well-established servicing companies, which were beneficiaries of the training project, continue training activities once the project was over in order to maintain and expand their position on the market. All the smaller remaining beneficiaries supposedly use the core of trained technicians to continue the hands-on training of newcomers. The latter, however, could not be verified in the absence of data in the Ozone Office. The opportunity for the continuation of training would be much more encouraging had the Refrigeration Association been established and the legislation requiring mandatory qualification of servicing personnel adopted.

8.2.1.2.5 Achievement of outputs and activities

627. The achievement of outputs and activities is analysed in the section on the Attainment of objectives and planned results. The first eleven planned outputs as listed in the Table were achieved. Outputs 12 and 13 were partially achieved.

8.2.1.2.6 Assessment of Monitoring and Evaluation Systems

8.2.1.2.6.1 M&E design

628. Similar to IS project, the training component was managed by DTIE office in Paris. The NOU has exercised the monitoring and coordination functions. The analysis of limitations in the evaluation of the M&E design of the IS Project contains in the relevant Section above. The same limitations are applicable to the analysis of the M&E design of the UNEP training component. The shortcomings of general nature in the M&E design have been identified in the 2004 mid-term evaluation report (MTER). In particular, the report called to review and determine the adequacy of Performance Indicators (PIs) where they exist and assign PIs where they don't exist. The

Report recognized also the lack of result-based management and accountability framework.[71] The 2002 UNDP Project Implementation Reports (PIR) indicated to similar problems. The assessment of M&E design in regard to the IS project as contained in Paragraphs 68 to 70 is also relevant to the M&E of the training component.

629. Training in good practices and provision of basic tools resulted in some reduction of consumption of CFC-12 in the servicing sector. However, the achievements of training component in terms of reduced ODS consumption could not be verified. The practical use of knowledge transmitted through training has not been monitored and documented once the training was accomplished. UNEP DTIE did not develop and employ the appropriate methodology to determine the baseline, performance indicators and progress achieved through the training of servicing personnel in terms of relevant reduction in ODS consumption.

8.2.1.2.6.2 M&E plan implementation

630. The internal monitoring of the training activities had been conducted by the MENR, NOU staff and local consultants. The monitoring functions were part of working responsibilities of UNEP DTIE. UNEP DTIE representative attended the first train-the-trainers workshop. According to the Mid-term Evaluation Report, monitoring and reporting on the project activities has been carried out in a timely, comprehensive and efficient manner. There is no information, however, provided to the evaluation team on monitoring activities of UNEP DTIE.

8.2.1.2.6.3 Long-term Monitoring

631. It was envisaged that upon completion of the project, the long term monitoring of outcomes of the training component would be the responsibility of the Government and the NOU. Due to lack of resources, the Ozone Office was not capable to organize the long-term monitoring of the training component.

8.2.1.2.7 Assessment of processes that affected attainment of project results

8.2.1.2.7.1 Preparation and readiness

632. According to 2004 MTER, the NOU undertook important preparatory activities to start off the training courses as planned. UNDP delivered the training equipment in time. The training centres were established and furnished with training equipment. The NOU Coordinator and his assistant officer being refrigeration engineers prepared training modules for both service technicians and engineers using the UNEP Training Manual on "Good Practices in Refrigeration" as a resource document.

633. The application of good servicing practices requires modern tools and equipment. The procurement of the necessary tools was not reflected in the project document and the budget attached to it. The UNDP project "Recovery and recycling of ODS refrigerants in the air-conditioning and refrigeration sector" included the procurement of recovery and recycling equipment as well as 300 kits of tools and instruments for better servicing and containment of refrigerants to be distributed among servicing workshops . The UNDP project had also a training component targeting training of 200 technicians in 20 training sessions. The UNDP training program had many elements that are similar to the UNEP training curriculum. The UNEP project document contains a brief reference to the UNDP recovery and recycling project ("This project will be coordinated with the Recovery and Recycling project being implemented with UNDP") but fails to establish the link between these two projects. It appears that there was a very little coordination and partnership between two agencies at the stage of preparation of their project designs. At the implementation stage, the NOU tried to coordinate and optimise the distribution of servicing and recovery and recycling equipment taking into account the results of the UNEP training program. Yet, two agencies had two separate sets of training courses resulting in duplication of their efforts.

634. The design of UNEP training projects in many Article 5 countries and CEITs included the component for the training of customs officers with the budget for procurement of ODS identifiers through UNDP/UNOPS. In Azerbaijan, the training of customs officers was completely

[71] Mid-term evaluation report 4 July 2004, Victor Buxton and Risto Ciconkov

omitted at the planning stage of the training project and was incorporated at the implementation phase using resources from the IS project. These resources proved to be sufficient only for training of about 200 customs officers. Recourses for procurement of CFC identifiers have not been envisaged. The absence of ODS identifiers impaired the ability of customs officers at checkpoints to combat with illicit trade of CFCs until recently when the SCC equipped their checkpoints with these instruments.

635. It appears that the UNEP preparation and design of the training project in Azerbaijan, and the coordination of its implementation with UNDP were not fully adequate.

8.2.1.2.7.2 Country commitment; Stakeholder involvement

636. The training of refrigeration technicians was part of the approved country programme. Apparently, the following concerned parties were involved in the implementation process: the State Committee of Ecology (now Ministry), the State Customs Committee, the Ministry of Education, the concerned departments of the Government, the refrigeration and air conditioning sector companies and educational institutions. The presence of officials from the ministries and agencies raised awareness about MP issues, ODS import licensing and quota system issues, and enhanced communication between the NOU and governmental entities involved.

637. Upon completion of the UNEP training courses, a license certificates had been awarded to the technicians who have successfully completed the training course. This certificate was intended to be one of the requirements in obtaining a license for handling and purchasing CFCs. There were plans to develop a relevant legislation for a mandatory qualification of servicing personnel. These plans, however, have not materialized.

638. According to the Mid-term evaluation report, the ODS related curriculum was introduced in the local technical university in 2002. However, the Ozone Office has no information on the current status of the ODS related training curricula in universities and vocational schools. The refrigeration association could play a very important role in dissemination of knowledge among the refrigeration community in stimulating the continuation of the training of servicing personnel. Unfortunately, this public institution is yet to be established in Azerbaijan. No other NGOs were involved in relevant training activities.

8.2.1.2.7.3 Financial planning

639. UNEP DTIE had been disbursing cash advances according to working plans developed by the NOU and approved by the Minister of Ecology and National Resources. The following financial tranches had been expended upon receipt of expenditure reports. There were no significant delays in following this procedure by parties involved. The planned activities had been implemented in accordance with the timetable established in the project document. The Phase 1 was accomplished in May 2000. The Phase 2 had been implemented from October 2000 until November 2001.

640. No allocations were envisaged for training of customs officers and procurement of ODS identifiers in the project design. Resources for training of customs officers were drawn from the budget of the IS project. ODS identifiers had not been purchased putting the border control at risk.

8.2.1.2.7.4 UNEP / UNDP Supervision and backstopping

641. UNEP DTIE was supervising the training component since its inception. The project budget included allocations for supervision and travel. The UNEP backstopping officer visited Baku together with the international consultant to start up the Phase 1 training. Notwithstanding a rotation of backstopping officers in DTIE Paris office, the project proceeded according to the established schedule.

642. UNEP as a supervisory agency was not forthcoming as much as necessary to ensure the better coordination with UNDP in combining training activities under UNEP training and UNDP recovery and recycling project. More close coordination could avoid duplication in training curricula and save resources.

8.2.1.2.7.5 Co-financing and Project Outcomes & Sustainability

643. The co-financing was not a requirement for the implementation of the planned training

activities. The sustainability of the achieved outcomes was directly related to continuation of the training program upon completion of the project and required the full cooperation of the Government and public institutions. Seemingly, the local technical university introduced the ODS related course in its curricula in 2002 that can be characterized as co-financing from the Government.

8.2.1.2.7.6 Delays and Project Outcomes & Sustainability

644. There were no delays in the implementation of the project. All the training activities had been accomplished as planned. The risk in sustainability of outcomes of the project relates to weak Government commitments to secure the monitoring and continuation of training activities.

8.2.1.2.8 Project ratings

645. The ratings of the training project is rated according to categories and criteria specified in Annex 1 of the Terms of Reference of the evaluation. The ratings are presented in Table 25.

Table 25: Project ratings for the training project in Azerbaijan

Criterion	Evaluator's Summary Comments	Rating
Attainment of project objectives and results (overall rating)	Not all the project objectives were attained	MS
Effectiveness	As a result of the project, 1,011 servicing technicians have been trained and certified, and good servicing practices have been introduced into routine operation of beneficiary servicing workshops. The targeted reduction in demand of CFC refrigerants was established at about 20% of annual consumption in the servicing sector that could not be verified due to lack of methodology. The legislation on mandatory qualification of servicing personnel was not adopted as planned.	MS
Relevance	All project outcomes are fully consistent with national priorities and GEF strategy in ozone and climate focal areas.	HS
Efficiency	It is not possible to measure the impact of the training programme in terms of ODP tonnes phased out. Expenditures per trainee amount to $111. The project was implemented according to the schedule without delays.	S
Sustainability of Project outcomes (overall rating)	The ongoing demand for CFC refrigerant and continuing illegal ODS trade poses the moderate risk to the sustainability of outcomes of the training programme.	ML
Financial	Once the training programme was completed and the project was terminated in 2002 there was no financing specifically provided by the Government to continue and expand the training activities in the refrigeration servicing industry.	ML
Socio Political	Lack of continuation of centralized training of refrigeration technicians increases the risk	ML

Criterion	Evaluator's Summary Comments	Rating
	of unskilled technicians entering the workforce. The legislation requiring mandatory qualification of servicing personnel is yet to be developed and approved by the Government.	
Institutional framework and governance	The Ozone Office has very limited capacity and resources to ensure the continuation of training activities in the refrigeration sector. The Ozone Office has no information on the current status of the ODS related training programme in the country.	ML
Environmental	There is still high demand for ODS refrigerant and, respectively, a risk of inappropriate handling of CFC refrigerant.	ML
Achievement of outputs and activities	The majority of planned outputs and activities have been accomplished. Several legislative measured yet to be adopted.	MS
Monitoring and Evaluation (overall rating)	The monitoring and evaluation system does not appear to be adequate to measure the level of success of the training programme.	MS
M&E Design	The project document The achievements of training component in terms of reduction in ODS consumption could not be verified because of lack of appropriate methodology.	MS
M&E Plan Implementation (use for adaptive management)	The routine monitoring of progress was primarily based on the review of quarterly and semi-annual reports submitted by the NOU to UNEP DTIE.	MS
Budgeting and Funding for M&E activities	The budget had allocations for M&E activities.	S
Catalytic Role	The project had a certain replication effect since hands-on training continued in companies-beneficiaries once the project was terminated.	No ratings are requested for the catalytic role.
Preparation and readiness	The NOU undertook the preparatory work organizing training centers and preparing and translating training modules. The design of the training project did not include the components for training of customs officers and procurement of ODS identifiers, and the associated budget.	MS
Country ownership / commitments	The Government demonstrated the satisfactory level of commitments and ownership in supporting the implementation of training activities outlined in the project. The premeditated legislation for a mandatory qualification of servicing personnel was not established. The role of the existing Ozone Office is immaterial in monitoring and continuation of training activities.	MS
Stakeholders involvement	The project involved all relevant stakeholders in project preparation and execution. The	MS

Criterion	Evaluator's Summary Comments	Rating
	Ozone Office has no information on the current status of the ODS related training in universities and vocational schools. The Refrigeration Association is yet to be established.	
Financial planning	There was no problem with cash flow for the implementation of planned training activities in the servicing sector. No allocations were envisaged for training of customs officers and procurement of ODS identifiers in the project design. Resources for training of customs officers were drawn from the budget of the IS project. ODS identifiers had not been purchased putting the border control at risk.	MS
UNEP Supervision and backstopping	UNEP DTIE supervision and backstopping of the training component was adequate. UNEP as a supervisory agency was not forthcoming as much as necessary to ensure the better coordination with UNDP in combining training activities under UNEP training and UNDP recovery and recycling project. More close coordination could avoid duplication in training curricula and save resources.	MS
Overall Rating	Not all the objectives of the project were met.	MS

8.2.1.3 AZE/98/G33 - Recovery and recycling of ODS refrigerants in the air-conditioning and refrigeration sector (UNDP/UNOPS);

8.2.1.3.1 Background

646. The Government of Azerbaijan approved the RMP as part of its Country Programme which addressed the ODS phase out in the refrigeration sector. The ODS phase out in the refrigeration servicing sector requires a systematic approach based on a wide-ranging strategy encompassing training, technical assistance and legislation-oriented activities. The GEF project in Azerbaijan is formulated as a framework project consisting of a capacity building and training component implemented by UNEP and a technology conversion and technical assistance component implemented by UNDP. The UNDP recovery and recycling sub-project aimed at establishing the system of recovery, reclamation and reuse of CFC refrigerants avoiding imports of new CFC refrigerants for servicing the existing refrigeration equipment.

647. The survey completed by the Government in assistance with UNEP and UNDP indicated that the bulk of 1996 CFC consumption was in the refrigeration servicing sector amounting to about 340 ODP tonnes. The sector dealt with servicing of about 2,500,00 domestic refrigerators, 13,000 commercial and Industrial units, 9,880 refrigerated containers used on the railway and road transportation systems, and about 10,000 vehicles equipped with CFC-based Mobile Air Conditioners (MAC) equipment.

648. The refrigerant recovery involves the removal of the refrigerant in vapour or liquid form for reuse or storing in an external container for subsequent recycling or destruction without testing or processing it. The refrigerant recycling means to process the contaminated refrigerant through oil separators and filter dryers using a recycling machine working predominantly at a local service shop. The refrigerant reclamation requires that the contaminated refrigerant be reprocessed using evaporation, segregation and distillation operations to meet new product specifications. The reclamation infrastructure represents a significant investment and may only be economical for large quantities of recovered refrigerant. In Azerbaijan, reclamation

equipment was not part of the UNDP project.

8.2.1.3.2 Attainment of objectives and planned results

8.2.1.3.2.1 Objectives, outputs, outcomes and performance indicators

649. The UNDP ODS recovery and recycling (R&R) project in Azerbaijan was approved in February 1999. Funding of $1,106,401 was allocated by the GEF to UNDP/UNOPS to implement the *r*ecovery and recycling of ODS refrigerants in the refrigeration and air-conditioning sector as part of a national Refrigerant Management Plan. The installation of reclamation facilities has not been under consideration due to limited quantities of refrigerants in the installed refrigeration equipment. The objectives of the R&R project were to assist the Government in phasing out consumption of CFCs by 1 January 2001 as established for Azerbaijan in MOP Decision X/20 through introduction of refrigerant conservation and containment measures combining good servicing, repair, and recovery and recycling practices. It was envisaged to recover and recycle about 85 ODP tonnes of CFC refrigerants annually and respectively to reduce the demand in imported CFC refrigerant.

650. The proclaimed objectives have been attained by provision of recovery, recycling, and servicing equipment and training of personnel that received this equipment using UNOPS/UNDP facilities. The UNDP/UNOPS training was complementary to the training programme provided by UNEP. The outputs were defined as follows: delivery of the necessary R&R and servicing equipment to selected refrigeration servicing workshops; training of refrigeration technicians; lending technical support and provision of technical information; demonstration of recovery and recycling procedures and good servicing practices to refrigeration technicians. The NOU took responsibilities for monitoring the recovery and recycling operations.

651. The outcomes were defined as introduction of refrigerant recovery and recycling practices throughout out the country, resulting in the decrease of national CFC demand and the reduction of ODS emissions into the atmosphere. In the absence of the logframe and performance indicators (PIs) for the evaluation of the R&R project and its training component, the PIs were inferred from the outputs/deliverables contained in the UNDP project document, and UNDP PIR (Table 26).

Table 26: Azerbaijan ODS Recovery and Recycling Project - Objectives/ Intended Results - Outputs/Deliverables - Outcomes/Performance indicators

Objectives/Intended Results	Outputs/Deliverables	Outcomes/Performance indicators
1. Introduction of sustainable refrigerant containment and R&R practices and reduction in ODS emissions into the atmosphere 2. Reduction in CFC demand to meet the Montreal Protocol CFC phase out targets established in Decision X/20	1. Procurement and delivery of servicing, and recovery and recycling equipment to the country 2. Development and promotion of legislation supporting R&R operations 3. Development and distribution of R&R manuals and regulations 4. Selection of participants and conducting training workshops on good servicing and R&R practices and certification of graduates	1. Adoption of legislation supporting R&R operations 2. Establishment of ODS recovery and recycling system in the refrigeration and air-conditioning sector 3. Attainment of ODS phase out targets through the reduction of demand and use of recovered and recycled ODS in the servicing sector

Objectives/Intended Results	Outputs/Deliverables	Outcomes/Performance indicators
	5. Distribution of R&R and servicing equipment among servicing workshops 6. Establishing a R&R monitoring system 7. Reporting R&R results	Timely adoption of ODS imports licensing and quota system Proper timing in procurement and delivery of R&R equipment (Q2/1999); Preparation and translation of R&R training materials; Number of R&R trained and certified refrigeration technicians (200 technicians) ; Number of R&R machines distributed to servicing workshops; Increase in CFC prices in relation to substitutes; Timely commencement of R&R operations (Q3/1999); Quantity of ODS recovered and recycled (85 ODP tonnes annually); Adoption of legislation promoting recovery and recycling operations; Economic cost/benefits of adopted R&R programme; Availability of R&R monitoring system during and after the project; The availability of R&R data in the NOU and UNDP.

8.2.1.3.2.2 Effectiveness

652. The timetable of the R&R project reflected the requirement to contribute to the complete CFC phase out by January 2000. According to the timetable, the recovery and recycling operations should start in six months time from the date of the GEF approval i.e in July-August 1999. The total project duration was determined to be 18 months and planned for closure in June 2000. The project experienced delays and was completed in June 2001 by 12 months later than

scheduled.

653. UNOPS procurement office formulated the required specifications for R&R and servicing equipment, organized the international bidding and delivered the equipment. The list of equipment for refrigerant recovery operations included 300 sets of portable recovery machines and recovery bags together with refrigerant cylinders and recovery equipment kits, including manifolds, hoses, tools and accessories, electronic leak detectors and weighing scales. The UNOPS procurement office acquired 50 sets of refrigerant recycling and servicing equipment for recycling centres, including automatic single cycle recycling machines together with 10 machines designed for servicing mobile air-conditioners, 50 portable recovery machines and recovery bags, refrigerant cylinders, vacuum pumps for handling storage cylinders, refrigerant identifiers and recovery kits, tools and accessories. Spare parts were included in the delivery package.

654. The NOU selected potential beneficiaries among registered servicing workshops and refrigerant distributors on the basis of their pattern and quantities of CFC refrigerants used in their servicing operations. There were a number of small unregistered servicing enterprises and individual entrepreneurs with insignificant CFC consumption that had been left out from the NOU consideration. The database of potential beneficiaries was compiled by the NOU. The UNDP consultant arrived to Baku and conducted training workshops in the training centre established in the Baku Technical University. The training curriculum included the following topics: the theory of Ozone Layer and impact of CFC emissions; the production and supply trends of ODS refrigerants (CFC-11, CFC-12, R-502, HCFC-22); proper and safe handling of CFC refrigerant; Recovery, Recycling and Reclamation of ODS; good ODS containment practices in servicing the refrigeration equipment (refrigerant recovery procedures, methods of evacuation of systems before recharging, prevention and early detection of leaks). Hands on training followed demonstrating the work of the supplied recovery and recycling equipment in servicing of different refrigeration systems. Later, the national consultant conducted a series of one day workshops in different geographical locations of the country. All the participants received translated recovery and recycling manual. Upon completion of the training course, the trainees have been tested and provided with certificates. According to the project document, the targeted number of trainees was 200. The UNDP PIR does not provide detailed information on the number of training courses and the number of certified technicians.

655. The distribution of the recovery and recycling equipment was performed by the NOU. Servicing workshops dealing with commercial and domestic refrigeration equipment were in the focus of NOU attention. The placement of 300 sets of recovery machines and associated servicing kits have been determined by evaluating the most effective locations with regard to their access to the largest and consistent volumes of CFC-12. The ownership of recovery and recycling equipment was maintained with the Government. According to agreements between NOU and servicing enterprises, the recovery and recycling equipment was leased to the owners on a non-commercial basis. The enterprises were responsible for keeping records and reporting data to the NOU on quantities of refrigerants recovered and recycled and the efficiency of the equipment. It was envisaged that with time the locations of R&R equipment might be changed and the machines would then be relocated to facilities with greater needs. There are no records available about the termination of the agreement and/or relocation of the R&R equipment.

656. Altogether, 32 recycling centres were established. Several recycling centres were situated within the principle refrigerant distributors with refrigerant handling experience. Fifty recovery units have been held in reserve in the recycling centres, to be made available for recovery operations by workshops and firms not included in the primary recovery network and for replacement while the units were sent for repair and maintenance. No information is available about the distribution of these 50 recovery units.

657. About 10,000 vehicles were identified as equipped with CFC-12 based MAC systems. The network of MAC servicing workshops exists in the country. Most of these workshops are located in the capital Baku. In average, each car MAC system contains about 1 kg of refrigerant. There was a good potential to reduce CFC emissions in this sector by providing recycling equipment to servicing workshops. When distributing 10 recycling machines designed for servicing MAC systems, special attention was given to those workshops that had a record of sufficient number of MAC repair jobs.

658. In all cases, the proper training of servicing personnel was a mandatory requirement for the enterprise in obtaining R&R equipment.

659. The adoption of the licensing and quota system was a positive initiative to promote recovery and recycling operations. In order to make R&R operations more effective and efficient, the project design envisaged introducing a retailer licensing scheme that would have made mandatory for servicing enterprises to obtain a retailer license for purchasing CFCs from wholesalers/importers. A pre-requisite for issuing such licenses would be that at least one technician of the servicing workshop had received training in good servicing practices and recovery and recycling. Another NOU legislative initiative promoted mandatory qualification requirements for all refrigeration servicing personnel. Certain economic and fiscal measures were envisaged in the country programme to discourage the import of CFCs and promote CFC alternatives. Unfortunately, none of these measures was materialized.

660. The historical data on the relative prices of CFCs and their alternatives can provide a key indicator of relevant economic conditions for R&R operations. Once the prices for CFC-12 increase exceeding HFC-134a prices, this might create the favourable market situation for sustainable CFC-12 recovery and recycling operations. Unfortunately, these data are not available in the Ozone Office in Azerbaijan.

661. The establishment of a monitoring system in the NOU was a very important step. Reportedly, the NOU kept the database of the equipment distributed and the record of quantities of recovered and recycled ODS. The R&R operations commenced in 2000 when the CFC consumption was 87.8 ODP tonnes. Unfortunately, the NOU monitoring activities were short lived and stopped with the closure of the IS project in 2002.

662. The CFC consumption should be reduced to zero by 1 January 2001 according the Country Programme and MOP decision with important contribution from the R&R programme. In the project document, the targeted quantity of recovered and recycled CFCs was determined to be 85 ODP tonnes. In reality, the CFC consumption was completely phased in 2006. While the non-compliance issue was discussed by the Implementation Committee in its sessions in 2004 and 2005, the representative of Azerbaijan could not provide reliable information about enterprises consuming CFCs and the contribution of ODS recovery and recycling operations to the reduction of CFC consumption.

663. The establishment of an effective monitoring system is the important factor for the success of the R&R programme. In particular, the monitoring system ensures that: i) the recovery machines are adequately distributed to secure the maximum efficiency of recovery operations, ii) the recovery and recycling equipment is properly used, maintained and timely supplied with spare parts; iii) proper records of the quantities of CFC recovered, recycled and reused are maintained. Assumingly, the NOU conducted the monitoring for about a year in 2001- 2002 until the project was closed. Presently, the records showing the actual quantities recovered and recycled CFCs are not available in the Ozone Office. Therefore, it is not possible to establish the practical contribution of R&R programme into overall reduction of CFC consumption in Azerbaijan in relation to the established target. It should be mentioned also that the target of recovered and recycled quantities was calculated purely on the basis of capacity of R&R equipment. The lack of data on the volume of recovered and recycled material and relative prices of CFCs and alternative refrigerants does not allow performing the economic cost/benefit analysis of recovery and recycling programme in Azerbaijan.

664. The evaluator visited Titan Group the manufacture of commercial refrigeration equipment, cold rooms and display cabinets. The company is also engaged in the sale and servicing of imported refrigeration equipment. The refrigeration servicing department of Titan comprised 20 technicians that participated in the GEF training and recovery/recycling programmes. Titan reported that the training workshops and servicing manuals provided to them were very useful. In total, about 1,200 kg of CFC-12 were recovered and reused. However, Titan discontinued its recovery and recycling operations because their clients ceased to use CFC-12 equipment. Moreover, CFC-12 was still available on the market at a moderate price that undermined the economy of recovery and recycling operations.

665. In conclusion, the R&R and monitoring system was established through the UNDP project that made possible to reduce CFC emissions into the atmosphere. However, the Government and

NOU were not successful in developing and adopting the legislation that would facilitate recovery and recycling activities, including economic incentives, mandatory qualifications of servicing personnel and the long-term monitoring. In the absence of records of recovered and reused CFCs, it is not possible to ascertain the contribution of R&R activities to the ODS phase out in Azerbaijan.

8.2.1.3.2.3 Relevance

666. The R&R project is fully consistent with the GEF strategy in the ozone focal area and Azerbaijan country programme. The recovery and recycling operations contributed to the reduction of ODS emissions into the atmosphere. Since most CFC refrigerants are also greenhouse gases, the reduction in ODS emissions was also a factor in reduced global warming, bringing substantial benefits to the climate.

8.2.1.3.2.4 Efficiency

667. The project funding was $1,106,401. The cost-effectiveness of the project was assessed by UNDP to be US $11.9/kg ODP assuming the annual quantities of recovered ODS to be 85 ODP tonnes. However, this cost-effectiveness is a theoretical one and was not achievable since the total 2001 ODS consumption in the servicing sector did not exceed 50 ODP tonnes. The actual cost-effectiveness cannot be calculated because of lack of data on recovered and reused ODS. For the same reason, it is not possible to calculate another efficiency indicator: annual quantities of recovered ODS per each recovery machine provided under the R&R project and the calculated value of avoided imports of new refrigerants.

8.2.1.3.3 Assessment of Sustainability of project outcomes

8.2.1.3.3.1 Financial resources

668. According to the UNDP PIR, the R&R project was completed in June 2001 resulting in establishing the recovery and recycling and monitoring system. In August 2002, the GEF project in Azerbaijan was officially closed, GEF funding terminated and the NOU dissolved. The new ozone office was established by the Government a year later with inadequate funding and limited mandate. Subsequently, R&R monitoring activities were discontinued. No records are available regarding prices for CFC refrigerants. The information provided by Titan indicates that availability and relatively low prices of imported CFCs undermined the economic viability and sustainability of recovery and recycling operations by owners of R&R equipment

8.2.1.3.3.2 Socio-political

669. Formally, the ownership of R&R equipment belonged to the Government. However, the Government averted itself from responsibilities to monitor R&R activities, control the distribution, and maintain and repair of the R&R equipment provided under the UNDP project. In reality, the stakeholder ownership rested with servicing enterprises. The economic considerations were the only driver that determined the importance and priority of R&R activities for servicing companies. In the absence of legislation, promoting R&R activities there is a socio-political risk to the sustainability of the R&R project.

8.2.1.3.3.3 Institutional framework and governance

670. The level of Government commitments to the Montreal Protocol in general and to monitoring of R&R activities in particular was significantly diminished after the GEF project was closed and the NOU dissolved. The existing set up of the Ozone Office within the Governmental structure, the absence of the Refrigeration Association and the lack of legislation promoting R&R related activities jeopardize the sustainability of the outcomes of the R&R project.

8.2.1.3.3.4 Environmental

671. The replacement of CFC-based equipment with ozone safe equipment is in progress. Given the closure of production of CFCs globally, the phase out of CFC consumption in Azerbaijan is irreversible. The recovery and recycling of CFC-12 refrigerant will discontinue in foreseeable future. The use of HCFC-22 is growing. There is no data on the status of R&R equipment and quantities of recovered and recycled HCFCs in Azerbaijan. One can speculate that the recovery

and recycling equipment provided under the Project is still in the working condition and will be in use within the next decade.

8.2.1.3.4 Catalytic role

672. In the absence of the qualification and licensing regulations, there are no requirements for having recovery and recycling equipment for new servicing companies entering the refrigeration servicing business. Economic considerations are the only factor that would stimulate servicing enterprises in purchasing R&R equipment. No records in the Ozone Office are existed to make possible a meaningful analysis about prospective of R&R operations in Azerbaijan.

8.2.1.3.5 Achievement of outputs and activities

8.2.1.3.5.1 Delivered outputs

673. All the planned outputs as identified in Column 2 Table 6 have been achieved except development and promotion of legislation supporting R&R operations. The section on Effectiveness provided a detailed account of their quantity, quality and usefulness.

8.2.1.3.6 Assessment of Monitoring and Evaluation Systems

8.2.1.3.6.1 M&E design

674. The monitoring of the implementation of the project, including procurement and delivery of the R&R equipment, training and certification of servicing personnel was implemented by UNDP/UNOPS with assistance from the local UNDP office and NOU. The NOU was responsible for the monitoring of distribution of equipment and R&R activities and keeping records of the amounts of ODS recovered and recycled by each service centre. The national consultant was recruited to perform this task. The National Consultant set up a computer database to monitor the information received from service centres. He kept the database up to date and produced monthly reports. The National Consultant monitored and ensured that: the recovery machines are distributed in the way to maximize the volume of recovered CFCs; all the equipment was properly used and maintained; proper records of the amounts of CFC recovered, recycled and reused are maintained. The NOU reported the results to the UNDP Headquarters.

675. The contracts between the NOU and beneficiaries envisaged that the ownership of the machines and equipment would be kept by the Government throughout the duration of the project and then transferred to the users. The transfer will be subject to final evaluation of the R&R activities carried out by the individual users.

676. The project document contains the timetable with major milestones such as approval of the project by the GEF, procurement and delivery of equipment, conducting demonstration workshops, distribution of equipment, starting recovery and recycling operations, setting up the monitoring system. The implementation schedule indicates the time interval (a quarter of the year) as a target for the accomplishment of specific milestones without linkages to specific dates. The timetable is the only monitoring tool to track progress towards achieving project outputs. The ODS reduction (85 ODP tonnes) and the number of servicing shops as beneficiaries (350) were the measurable indicators incorporated in the project document. The M&E design envisaged the evaluation of the progress through the evaluation missions of the UNDP consultant.

8.2.1.3.6.2 M&E plan implementation

677. The GEF approved the R&R project in February 1999. According to the timetable, the duration of the project was 18 moths i.e. the completion of the project was due in July 2000. The project was completed in June 2001 with 11 months of delay. According to the project document, the NOU was assigned the responsibilities on the operational control, monitoring and reporting of the R&R activities. The national consultant was awarded a 12 months contract to conduct monitoring of R&R operations, including missions to the major regions in the country. As indicated by the UNDP PIR, the NOU produced all the required reports and provided data on recovered and recycled refrigerant and on the status of R&R equipment until the closure of the GEF project in August 2002.

678. Upon completion, the R&R project was the object of tripartite review of the progress and

evaluation report. Seemingly, the review was conducted by representatives from the Government, the NOU and UNDP, and the results of the project were recognized as positive and all responsibilities in regard to the provided equipment and monitoring of R&R operations were accepted by the Government.

679. The evaluators have not been provided with the relevant documentation and, therefore, cannot pass their judgement on the implementation of M&E plan.

680. The Ozone Office was newly established in 2003 by the Government. No monitoring activities of R&R operations have been undertaken by the Ozone Office due to limited capacity and inadequate resources.

8.2.1.3.6.3 Budgeting and Funding for M&E activities

681. The budget of the project included the cost for the monitoring system amounting to $10,100 for 12 months duration and expenses of the international consultant for the evaluation missions.

8.2.1.3.6.4 Long-term Monitoring

682. The long term monitoring was envisaged as a responsibility of the Government once the project was terminated. The newly established Ozone Office has not continued any monitoring activities due to limited resources.

8.2.1.3.7 Assessment of processes that affected attainment of project results

8.2.1.3.7.1 Preparation and readiness

683. The Government and NOU undertake preparatory activities compiling the list the most perspective servicing companies in terms of quantities of CFCs used in their operations. The Government and NOU facilitated customs clearance of delivered R&R equipment and organizing training and distribution of equipment.

684. The Government made ambitious commitments to phase out CFC consumption by 1 January 2001. The major objective of the R&R project was to contribute in meeting these commitments in a maximum extent possible. The UNDP strategy was to start the implementation of the R&R activities in twelve months after GEF approval of the project (February 1999) and subsequent to adoption of the legislation on ODS import licensing and quota system that planned to be established in January 1999. It was also anticipated that the introduction of taxation of ODS imports and a system for licensing operators in the refrigeration servicing sector should further reinforce the efficiency of R&R activities.

685. In reality, ODS import licensing and quota system was introduced only in May 2001. The R&R project was implemented with 12 months delay. The planned legislation on ODS import taxation and mandatory qualification of servicing personnel did not materialize. The monitoring system functioned only for 12 months until the project was terminated. The long-term monitoring proved to be unsuccessful.

686. The R&R project has the training component while UNEP implemented its separate training project. The curricula of two training programmes contain many similar elements. The curricula of the R&R training component incorporated quite a lot of information and on-hand demonstration of good servicing practices. Both training programmes could be effectively merged bringing certain savings of resources. Such an approach would result in interdependency of two agencies and require more close coordination and partnership. In reality, however, the implementation of the training programme by UNEP experienced serious delays that would have put at risk the success of the R&R component.

687. The training component of the R&R project emphasized the importance of the elimination of refrigerant venting and leak prevention. The use of nitrogen for pressurizing the system and vacuum pumps for evacuation of the system are internationally proved techniques enabling to reduce ODS emissions in servicing operations. According to the project document, the supply of only 50 vacuum pumps was envisaged to recycling centres disregarding the needs of numerous servicing workshops. Nitrogen cylinders were not included in the list of supplied equipment.

8.2.1.3.7.2 Country commitment

688. The R&R activities were included in the Country Programme approved by the Government as a

tool in achieving complete ODS phase out by January 2001. It was anticipated that the early introduction of R&R practices would result in significant reduction of the demand in imported CFC refrigerants. It was understood also that once CFC imports stopped in 2001, the recycled CFC would be the only alternative source of CFC-12 refrigerant in the country for maintaining the existing refrigeration equipment. The project design was fully in line with the national plans and Government commitments in order to contribute towards achievements of Montreal Protocol targets.

689. The Government through the NOU provided support to the implementation of the R&R project in terms of organizing training, certification of trainees, distribution of equipment and establishing a short-term monitoring system.

690. The Government committed to reinforce the expected impact of R&R operations by the introduction of the following legislation: ODS import licensing and quota system by 1 January 1999; taxation the imports of ozone-depleting substances to ensure meeting the year 2001 phase-out target; and establishing a system for licensing operators in the refrigeration servicing sector. The establishment of the Refrigeration Association was also anticipated.

691. The Government managed to meet their commitments only partially. The ODS import licensing and quota system was introduced in June 2001 with a delay of 2.5 year. This legislation did not proved to be effective. The imports of CFCs continued until 2006 when a new Presidential Decree banned CFC imports. The rest of expected regulatory measures have not been occurred. The Ozone Office that was newly established by the Government has not been adequately funded and capable of monitoring the continuation of R&R operations.

8.2.1.3.7.3 Stakeholder involvement

692. The project involved UNOPS/UNDP, Government institutions, NOU and refrigeration servicing industry as the major stakeholders in the implementation, monitoring and evaluation of the R&R project. Additionally, it was expected that the Refrigeration Association would have been established to support the outcomes of the project, especially in continuation of the monitoring activities. Unfortunately, these expectations did not materialize. The beneficiaries of the R&R programme were outreached by the NOU through awareness campaign and training workshops. At the initial stage of the project, beneficiary enterprises participated in the monitoring activities undertaken by the national consultant providing the necessary feedback. The NOU reported R&R data to the UNDP headquarters. The final evaluation mission was organized in 2002 with the participation of MENR, the NOU and representatives of UNDP.

693. The regular monitoring and reporting of R&R data stopped upon termination of the project in 2002. The newly established Ozone Office was not capable of continuing monitoring and maintaining the sound involvement of industry participants in maintenance of R&R equipment, providing repair and spare parts and making the redistribution of equipment when it deemed necessary. This lack of Ozone Office capability was detrimental for the efficiency and sustainability of the outcomes of the project.

8.2.1.3.7.4 Financial planning

694. The budget for the R&R project amounted to $1,106,401, including $91,292 as the agency overhead costs. The budget included allocations for procurement of the R&R equipment, technical assistance, training, monitoring and evaluation. The procurement and delivery of equipment was implemented by UNOPS. The control of expenditures was with the UNDP Montreal Protocol Unit and UNDP GEF Unit. The funding of training workshops and monitoring was organized through the UNDP local office and the NOU. There was no delay in flow of funds associated with procurement and delivery of equipment and the implementation of the training and monitoring components. According to UNDP PIR all the funds allocated for R&R project were spent by January 2002.

695. The evaluation of financial accounts and financial audits was not part of the Terms of References for this terminal evaluation.

8.2.1.3.7.5 UNEP / UNDP Supervision and backstopping

696. The implementation of the project was supervised by the UNDP Montreal Protocol Unit. The

UNDP organized two missions of the international consultant to Azerbaijan: one was for training of core trainers in R&R operations; the second one was for the evaluation of the progress and signing the Certificate of Completion of the project. Both missions were very useful in providing advice and expertise for the NOU and local staff involved in the implementation of the project. The UNDP stated that the R&R project was completed in June 2001.

8.2.1.3.7.6 Co-financing and Project Outcomes & Sustainability

697. There was no expected co-financing of the R&R project.

8.2.1.3.7.7 Delays and Project Outcomes & Sustainability

698. The data of completion of the project (June 2000) was determined having in mind the contribution of the R&R project to meeting the Government commitments of CFC phase out by January 2001. The completion of the R&R project experienced a delay of 12 months. The efficiency of R&R operations depend on the availability and prices of imported CFCs in relation to prices of non-ODS refrigerants. There was a significant delay in adoption of legislation introducing CFC import licensing and quota system that was adopted in March 2002. This legislation was not effective enough. The imports of CFCs continued until 2006 when a Presidential Decree banned these imports completely. The expected legislation measures on taxation of CFC imports were not materialized. It is difficult to assess the impact of delays in completion of the R&R project in the absence of historical records of quantities of recovered and reused CFCs. At any rate, delays in adoption of working and efficient legislation were more critical for non-compliance of Azerbaijan in 2001 to 2006. The lack of monitoring of R&R activities by the Ozone Office affected negatively the sustainability of the project.

8.2.1.3.8 Project ratings

699. The Recovery and Recycling project is rated according to categories and criteria specified in Annex 1: Terms of Reference of the evaluation. The ratings are presented in Table 27.

Table 27: Azerbaijan Recovery and Recycling Project ratings

Criterion	Evaluator's Summary Comments	Rating
Attainment of project objectives and results (overall rating)	Not all the project objectives were attained	MS
Effectiveness	Important project objectives were successfully attained by establishing the R&R and short-term monitoring system. The Government and NOU were not successful in adoption and enforcement of the legislation facilitating recovery and recycling activities. R&R operations started with a delay and could not contribute to meeting of 2001 zero CFC consumption target. In the absence of records of recovered and reused CFCs, it is not possible to ascertain the contribution of R&R activities to the ODS phase out in Azerbaijan.	MS
Relevance	All project outcomes are fully consistent with GEF strategy in ozone and climate focal areas. The objectives of the R&R project are incorporated into the Country Programme approved by the Government.	HS

Criterion	Evaluator's Summary Comments	Rating
Efficiency	The planned cost-effectiveness of $11.9/kg ODP was not achieved. In the absence of data on quantities of recovered CFCs, it is not possible to assess the efficiency using other PIs.	MS
Sustainability of Project outcomes (overall rating)	Long-term outcomes and impact of R&R project was uncertain after the project funding ended in 2002. CFC consumption continued until 2006.	MU
Financial	Availability and relatively low prices of imported CFCs undermined the economic viability and sustainability of recovery and recycling operations by owners of R&R equipment.	MU
Socio Political	The Government averted itself from responsibilities to monitor R&R activities, control the distribution, maintainance and repair of the R&R equipment provided under the UNDP project. In the absence of legislation, promoting R&R activities there is a socio-political risk to the sustainability of the project outcomes.	MU
Institutional framework and governance	The level of Government commitments to the Montreal Protocol in general and to monitoring of R&R activities in particular was significantly diminished after the GEF project was closed and the NOU dissolved. The existing set up of the Ozone Office within the Governmental structure, the absence of the Refrigeration Association and the lack of legislation promoting R&R related activities jeopardize the sustainability of the outcomes of the R&R project.	MU
Environmental	The R&R project contributed in a way to the CFC phase out that was achieved five years later than planned in the Country Programme. In the absence of data, it is not possible to establish the actual environmental benefits in terms of quantity of recovered ODS.	ML
Achievement of outputs and activities	The major outputs and activities have been accomplished except development and promotion of adequate legislation supporting R&R operations.	MS
Monitoring and Evaluation (overall rating)	The UNDP responsibilities regarding the monitoring system pursued short-term objectives. The Government was not able to continue monitoring activities. Therefore, M&E system does not appear to be fully adequate to measure the level of success of the R&R programme.	MS
M&E Design	UNDP M&E design of the project covered its short-term objectives. The monitoring	MS

Criterion	Evaluator's Summary Comments	Rating
	of long-term outcomes should be taken over by the Government upon termination of the project.	
M&E Plan Implementation (use for adaptive management)	The implementation of the project was monitored by the UNDP Montreal Protocol Unit in accordance with the project timetable. The 12 months delay in the start of R&R operations occurred. The Government was not able to organize the monitoring and supervision of R&R operations after the project was terminated	MU
Budgeting and Funding for M&E activities	The project covered 12 months NOU expenditures for monitoring and the cost of the UNDP evaluation mission. The Government was not able to provide adequate resources for continuation of the monitoring and supervision of R&R operations after the project was terminated	MU
Catalytic Role	In the absence of the qualification and licensing regulations, there are no requirements for having recovery and recycling equipment for new servicing companies entering the refrigeration servicing business.	No ratings are requested for the catalytic role
Preparation and readiness	The R&R activities were part of the country programme that was approved by the Government. The project design incorporated the necessary elements to make the project successful subject to timely and adequate introduction of regulatory measures and support by the Government in continuation of monitoring and supervision upon project closure. The Government contribution to the project was not fully adequate. As a result not all outcomes were achieved.	MS
Country ownership /motivation	The R&R activities were included in the Country Programme approved by the Government as a tool in achieving the phase out of all CFCs by January 2001 in conjunction with commitments to introduce legislation facilitating R&R operations. The Government did not manage to meet their commitments fully and well in time	MS
Stakeholders involvement	The project involved all relevant stakeholders in project preparation and execution. Upon project closure, the newly established Ozone Office was not capable of continuing monitoring and maintaining the involvement of industry stakeholders.	MS
Financial planning	There was no delay in flow of funds	MS

Criterion	Evaluator's Summary Comments	Rating
	associated with procurement and delivery of equipment and the implementation of the training and short-term monitoring components. The project had shortcomings in funding long term monitoring activities by the Government.	
UNDP Supervision and backstopping	In the absence of relevant documentation, it is not possible to evaluate the role of UNDP in supervision and backstopping.	
Overall Rating	The project had moderate shortcomings in the achievement of its objectives	MS

8.2.1.4 AZE/98/G32 - Elimination of CFCs in the manufacture of domestic refrigerators at Chinar (UNDP/UNOPS);

8.2.1.4.1 Background

700. Baku Chinar Refrigerators[72] was established in 1959 as a domestic refrigerator manufacturing company on the basis of a refrigeration repair workshop. In 1975, the company went through the reconstruction and its annual production capacity increased to about 300,000 units. Chinar is situated in the industrial zone of Baku and has a full production cycle. The main supplier of compressors for the production of domestic refrigerators was the Sumgayit Compressor Manufacturing Plant (SCMP) situated some 35 km away from Baku. SCMP was another beneficiary of the GEF assistance in Azerbaijan. During 1980 to 1990, Chinar produced five models of refrigerators at a rate up to its installed capacity. Chinar appliances were sold internally in many parts of the Soviet Union and partially exported. The manpower of the enterprise amounted to about 3,000 workers and engineers. The company used CFC -11 as a blowing agent in the production of rigid polyurethane insulation foam for the refrigerator cabinets and doors, and CFC-12 as refrigerant. After the breakup of the Soviet Union the output at Chinar declined. By 2000, the staff was reduced to 1,500.

701. Chinar was an important consumer of CFCs in the country. The Country Programme identified conversion of this enterprise to the non-ODS technology as a priority. UNDP prepared a conversion project. Funds of $2,906,496 were requested from the GEF to replace ODS-based technologies with cyclopentane and HFC 134a / HC-600a as the blowing agent and refrigerant respectively. The GEF assistance was necessary to modify the existing production lines, and to cover technology transfer, technical assistance, re-design, testing, pre-production trials and training. Incremental operational costs (IOC) were assessed to be $448,683 on the basis of 6 months of average 1993-1995 annual production (116,849 units). The assessed IOC were not requested but presented as in-kind co-finance by the enterprise. The project started in February 1999 and was completed in March 2002.

8.2.1.4.2 Attainment of objectives and planned results

8.2.1.4.2.1 Objectives, outputs, outcomes and performance indicators

702. The objectives of the Project are reflected in the Country Programme to convert Chinar manufacturing facility to ODS free technology contributing to phase out of national ODS consumption. The outputs and planned activities are contained in the project implementation schedule. In the absence of the logframe for the evaluation of the Project, outcomes and performance indicators were inferred from the outputs/deliverables contained in the UNDP project document (Table 28).

[72] http://www.cinar-az.com/en/index-en.php

Table 28: Phase out of CFCs in manufacturing of domestic refrigerators at Chinar: Objectives/ Intended Results - Outputs/Deliverables - Outcomes/Performance indicators

Objectives/Intended Results	Outputs/Deliverables	Outcomes/Performance indicators
1.The elimination of the use of CFCs in the manufacture of domestic refrigerators at Chinar to meet the Montreal Protocol CFC phase out targets 2.The establishment of ODS-free domestic refrigerator manufacturing capacity in Azerbaijan	1. Conversion of the refrigerator manufacturing at Chinar from the use of CFC-11 and CFC-12 to cyclopentane blowing agent and HFC-134a refrigerant respectively. Deliverables: Procurement of new production equipment; Delivery of new production equipment to the country; Installation of new production equipment;; Start up; Training of personnel; Re-design, prototyping, testing; Pilot scale production of new product; Test trials; Safety audits; Certification;	1. The phase out of 122.4 ODP tonnes in manufacturing domestic refrigeration appliances to meet the national obligations under the Montreal Protocol. The ODS-free production equipment is installed and commissioned; The safety audit is conducted by an external auditor; The manufacturing of ODS-free product is started; 2. Irreversibility of conversion CFC-based production equipment is destroyed or rendered unusable; The ban on imports of CFC-based refrigerators is introduced; 3. The stable production of domestic refrigerators is maintained based on alternative ODS –free technology avoiding the economic and social disruption after the conversion. The new product is competitive on the local market; The output after the conversion is comparable or higher than the production before conversion.

8.2.1.4.2.2 Effectiveness

703. The CFC consumption was calculated to be 122.4 ODP tonnes as an average of 1993-1995. The company used CFC-11 as a blowing agent in the production of rigid polyurethane insulation foam for the refrigerator cabinets and doors, and CFC-12 as refrigerant. By the time of project formulation, the HFC 134a refrigerant was universally accepted as a replacement for CFC 12 in the manufacture of domestic refrigerators and freezers. HFC 134a was widely available and the technology was mature, having already been introduced commercially in many developed

countries. Replacement of CFC 12 with HFC 134a required relatively modest changes to existing production facilities involving the use of specific compressors and the associated new synthetic lubricants, re-design of the refrigeration systems to cater for the difference in thermodynamic performance of HFC 134a versus CFC 12, prototyping, testing and optimisation of each refrigerator model. The different properties of HFC 134a and the need to avoid cross-contamination with CFC 12 required installation of new system evacuation, refrigerant charging, and leak detection equipment.

704. It should be noted that HFC 134a has a high GWP. However, based on consumer demand HFC 134a was often first selected as replacement for CFC 12. In the long run, hydrocarbon technology was a more preferable solution for the domestic refrigeration sector. Hydrocarbons were the only known substitutes for CFCs in household and unitary commercial refrigeration that have no ODP and virtually no GWP. Most major European manufacturers of domestic refrigerators and compressors have switched to isobutane as replacement for CFC 12 as the new refrigerant for domestic refrigerators and freezers.

Figure 14 Cannon cabinet foaming jigs

705. Based on the analysis of Chinar production process and taking into account the recommendations made by the GEF Council, the selected CFC 12 replacement technology was HFC 134a / HC 600a dual use system with the intention to convert to isobutane, if sourcing of HFC 134a and HFC 134a compatible components will become difficult. It was anticipated that the conversion to isobutane would take place on a model by model basis while the end-user demand was increasing. Given the flammable nature of isobutene, the conversion to the isobutene technology required more expensive helium leak detection systems, special charging machines and safety and fire protection measures.

706. Several options had been considered in replacing CFC-11 based foam blowing operations, including HCFC-141b, HFC-134a and cyclopentane blowing agents. HCFC-141b-based technology was the least expensive but it did not comply with the GEF strategic guidelines because of its transitional nature and was rejected. The disadvantage of HFC-134a foam was its inferior insulation performance. The cyclopentane-based technology was selected as a long term solution given its zero ODP and low GWP values. By the end of 90th, the substantial experience was accumulated in using the cyclopentane-based technology by leading European refrigerator manufacturers. Cyclopentane is a highly flammable material requiring extensive safety precautions in the manufacturing process and a special training of the workforce in order to meet international safety standards. The use of cyclopentane technology required substantial changes in the chemicals storage, processing, and refrigerator manufacturing facilities.

Figure 15 Cannon drum foaming unit

707. All the necessary production equipment have been procured, delivered by UNOPS and installed at the plant site with assistance from the international consultant. The equipment is shown in Figure 14, Figure 15 and Figure 16. The enterprise did not have any formal technology transfer agreements. The necessary technical assistance was obtained from their equipment suppliers and through UNDP technical support. The newly installed production lines provided capacity of 200,000 units annually. The conversion was associated with changes in manufacturing processes and procedures introducing technology that required extensive training of production line supervisors and operators dealing with flammable material. The new set up was subject to the independent safety audit to meet the international safety standards. The pilot scale manufacture and testing were undertaken by the enterprise for each model. The conversion of the

refrigerant line to HFC-134a/isobutane and cyclopentane alternatives was accomplished by UNDP/UNOPS, the personnel involved in production was trained and certified and the production of ODS-free refrigerators started in January 2002. The representative of UNDP/UNOPS and the management of "Chinar" signed the Certificate of Completion of the project and Declaration of Disposal of CFC baseline equipment. All the CFC- based production equipment was destroyed or rendered unusable. Thus, the conversion from CFC-12 and CFC-11 to HFC-134a/isobutane and cyclopentane was made irreversible. In 2002, Chinar produced 10,000 ODS-free units based on HFC-134a refrigerant.

Figure 16 Cyclopentane tank

708. The use of isobutane required new refrigerator design, including safety features and new specialized compressors. The new equipment was installed but had not been fully commissioned and had remained idle for about 10 years. The company foresaw little use for the line, given the low production and problems in handling two types of refrigerant and compressors. From the company's perspective, about $300,000 spent on the isobutane equipment was inappropriate.

709. It was planned to adopt legislation banning the import of CFC-based refrigeration equipment in order to create more favourable conditions for Chinar product at the local market and reduce the demand for CFC refrigerants in the servicing sector. The NOU attempted to develop the draft legislation but it was not promoted and adopted by the Government.

710. The ODS phase out target was established at 122.4 ODP tonnes based on the average three year production in 1994 to 1996 of 116,849 units. The Chinar production is not consistent with information provided by the TEAP expert. The Meeting of Parties established the TEAP Ad-Hoc Working Group on CEIT Aspects in 1995. A number of missions of experts were organized for the assessments of problems confronting CEITs in complying with the Montreal Protocol. One of these missions was in Azerbaijan in October 1995. The TEAP expert visited Chinar and noted in its report that "This year the factory could continue its production processes until October. Due to economic difficulties and lack of imported raw materials, only 21,000 pieces could be produced, after which the factory had to close down.[73]" Consequently, the consumption of Chinar could not exceed about 22 ODP tonnes in 1995.

711. In 2000 when the project was launched, the total CFC consumption was 87.8 ODP tones in Azerbaijan. The CFC consumption of Chinar is not known. If the output of Chinar maintained at about 20,000 units the assumed consumption could be about 20 ODP tonnes.

712. Since 2002, the production at Chinar has never exceeded 15,000 units that represent 7.5% of the installed capacity.[74] Currently, the plant is State-owned. In 2008, the production in Chinar was 13,000 units and the number of employees was reduced to 1,056. Only two of four assembly lines were working. The management explained that the enterprise experienced serious difficulties with cash flow and could not afford to purchase raw materials and components. There were difficulties with payments for routine maintenance of imported foam equipment. About $56,000 was urgently needed to purchase essential spare parts. Chinar product could not successfully compete with imported refrigerators available at the market in Azerbaijan. In 2007, the State Agency on Standards, Metrology and Patents revealed many violations in the production process and materials used. The production was stopped until remedy actions were applied.[75] Chinar is included in the list of state-owned companies to be privatized. The company estimated that investment capital of $5.0 - 6.0 million was needed to bring the company back to

[73] Report of the TEAP Ad-Hoc Working Group on CEIT Aspects, November 1995
[74] http://www.kommersant.ru/doc.aspx?DocsID=351303&print=true;
[75] http://www.ceo.az/ceostyle/betiket/16440.html?print=Y

full performance.

713. In conclusion, the execution of the project was proceeding according to the schedule with a delay about 10 moths. The conversion was completed and production of ODS-free appliances commenced albeit at about 6% of installed capacity reducing demand for CFC refrigerant in the servicing sector. The project contributed to the CFC phase out in the country and attainment of the Montreal Protocol targets. The project was not instrumental in making the enterprise profitable enough and successful on the market. The future of the enterprise is uncertain. However, without the project, the company most probably would not have survived.

8.2.1.4.2.3 Relevance

714. The conversion of Chinar contributed to the reduction of ODS emissions into the atmosphere that is consistent with the Country Programme and its priorities, and with the GEF strategy in the ozone focal area. Since most CFC refrigerants are also greenhouse gases, the reduction in ODS emissions was also a factor in reduced global warming, bringing substantial benefits to the climate.

8.2.1.4.2.4 Efficiency

715. The project was implemented by UNDP/UNOPS in the period from February 1999 until January 2002 with 11 months of delay against the approved schedule. Within 35 months the enterprise was able to start manufacturing of non-CFC product.

716. The cost-effectiveness of GEF grant was calculated following the guidelines approved by the MLF Executive Committee for projects using the hydrocarbon technology. These guidelines stipulate the discounting of the total project cost by 35% reflecting the costs associated with safety measures. In Chinar project, the cost-effectiveness was calculated at $13.5/kg ODP using 122.4 ODP tonnes of CFCs presumably consumed for production of 116,849 units as average annual production in 1994 to 1996. According to the TEAP expert report, the production in 1995 was 21,000 units resulting in CFC consumption about 22 ODP tonnes. If this consumption is applied, the cost-effectiveness would be $75.1/ kg ODP. This cost-effectiveness value exceeds by a factor of 5.5 the eligibility threshold of $13.5/kg ODP established by the MLF Executive Committee and used by the GEF as a benchmark in consideration of investment projects in CEITs. If the 1995 production level and cost-effectiveness were reflected in the UNDP project proposal, the justification for the approval of the project would most likely be questioned during the GEF review process.

8.2.1.4.3 Assessment of Sustainability of project outcomes

8.2.1.4.3.1 Financial resources

717. The financial resources provided by GEF covered fully the cost of conversion of the insulation foam and refrigerant related operations. The operating costs of the enterprise had been increased with adoption of ODS-free technology by about $7.68 per unit but these costs were not recognized eligible according to GEF guidelines and covered by the grant. The UNDP calculated operating costs for six months and represented it as the in-kind contribution. This co-financing was calculated to be $448,683 on the basis of 6 months of average 1993-1995 annual production (116,849 units). If the actual 1995 production is used for the calculation of IOC the co-financing would not exceed $80,640.

718. Once the GEF assistance ended in 2002, the enterprise was not able to reach the production that would ensure its economic viability. Currently, the enterprise experiences serious difficulties with cash flow and could not afford to purchase the necessary raw materials and components. There were difficulties with routine maintenance of production equipment. In 2009, about $56,000 was urgently needed to purchase essential spare parts. The company estimated that investment capital of $5.0 - 6.0 million was needed to bring the company back to full performance.

8.2.1.4.3.2 Socio-political

719. The conversion of Chinar was a priority project for the Government. However, the Government was not able to invest further to the enterprise to make it economic viable and sustainable. The workforce of the enterprise was reduced significantly. The enterprise is included in the

privatisation plan seeking an external investor.

8.2.1.4.3.3 Institutional framework and governance

720. The Government and NOU provided the necessary support to the management of the enterprise during the implementation of the conversion. The NOU was actively interacting with the State Customs Committee to ensure the timely clearance of imported production equipment.

8.2.1.4.3.4 Environmental

721. The conversion to HFC-134a refrigerant and cyclopentane blowing agent proved to be irreversible. This conversion, however, had a little impact on the local market of refrigeration appliances. Since 2002, the production in Chinar did not exceed 15,000 units that can be estimated as about 5-6% of the national imports of domestic refrigeration appliances to the country. The non-CFC-based appliances dominate at the local market imported from major international producers. The Government have not yet adopted legislation regulating imports of ODS containing equipment. Currently, the major risk is associated with illegal imports of CFC-12 for servicing old appliances still available in Azerbaijan.

8.2.1.4.4 Catalytic role

722. Chinar is the only manufacturer of domestic refrigerators in Azerbaijan. No replication or catalytic effect of the Chinar project was visible for the ODS phase out programme in the country. For UNDP, however, the experience of Chinar conversion can be very useful.

8.2.1.4.5 Achievement of outputs and activities

723. The outputs related to the project execution (procurement, delivery and installation of new production equipment, start up, training, re-design, prototyping, pilot scale production of new product, test trials, safety audit and certification) have been delivered with a not significant delay. However, the new product did not prove to be competitive and the enterprise output after the conversion was much lower than the installed capacity. The Government failed to adopt legislation regulating imports of ODS-based refrigeration and air-conditioning equipment. The section on Effectiveness provides a detailed account of their quantity, quality and usefulness.

8.2.1.4.6 Assessment of Monitoring and Evaluation Systems

8.2.1.4.6.1 M&E design

724. The project document contains the schedule reflecting the timing of all major steps of conversion. The project design envisaged the monitoring of the implementation by backstopping officers in UNOPS and UNDP Montreal Protocol Unit. The international consultant was assigned to develop the conversion plan that was agreed with the management of the enterprise. The implementation of the plan was supervised by the same international consultant in cooperation with the NOU and the UNDP local office. The project envisaged also a mission of a UNOPS consultant to make the final evaluation and sign the Certificate of Completion, including the Declaration of Disposal of CFC baseline equipment and Hand-over Protocol.

8.2.1.4.6.2 M&E plan implementation

725. According to the project implementation schedule the start up production of alternative products was scheduled in 24 months after the approval of the GEF grant. The enterprise commenced production of ODS-free appliances in 35 months after the date of approval of the project (January 2002).

726. According to UNDP PIR, the UNOPS international consultant supervised the implementation and visited the project site three times at key points in time providing the necessary expertise in planning, installation of production equipment, testing and prototyping, and evaluation of results and certification of the completion of conversion in January 2002. The tri-partite protocol on the completion of the project was signed by representatives of the Government, the NOU and the local UNDP office. UNDP was not able to provide documentation to the evaluation team that would have substantiated the implementation of M&E plan.

8.2.1.4.6.3 Budgeting and Funding for M&E activities

727. The budget of the project provided sufficient resources for monitoring, evaluation and supervisory activities through the following allocations: Technology Transfer/Technical Advisory Services - $50,000; Executing Agency Fee (UNOPS) - $213,321; Project Support Services (UNDP Country Office) - $26,665; Evaluation Mission - $10,000. All these resources were readily available.

8.2.1.4.6.4 Long-term Monitoring

728. The long term monitoring was not envisaged in the project. The responsibilities of executing agencies came to an end upon signing the certificate of completion. The NOU continued monitoring of CFC consumption by Chinar as part of its Article 7 reporting responsibilities.

8.2.1.4.7 Assessment of processes that affected attainment of project results

8.2.1.4.7.1 Preparation and readiness

729. UNDP had a substantial experience in conversion of domestic refrigeration manufacturing facilities in Article 5 countries as an implementing agency under the Multilateral Fund. The project design in many respect replicated the pattern of many approved projects under the MLF except the selection of dual HFC-134a/isobutane technology in the refrigerant part of the project. The installation of an additional isobutane refrigerant charging line was accepted by the GEF as a facility for future replacement of high GWP HFC-134a refrigerant with isobutene. However, the isobutane charging line was not fully commissioned and remained idle since 2002 due to low production and the lack of demand on the local market. The implementation mechanism relied upon the experience of UNOPS as an executing agency that was earlier involved in the implementation of similar projects in cooperation with UNDP. The project management and supervision followed established UNDP and UNOPS guidelines. The project was implemented according to established time schedule.

730. The investment project apart from achieving apparent ODS phase out needs to be considered from financial and economic point of view i.e. as a long term commitment of economic resources with the objective of producing and obtaining net gains in the future. The country programme determined one of the objectives of the ODS phase out activities in the refrigeration sector in the country as the stable production of domestic refrigerators at Chinar based on alternative ODS –free technology avoiding the economic and social disruption after the conversion. The difficult economic situation of Chinar has been progressing for the last seven years since the completion of the project. This raises the question of the project design that contains no financial and economic analysis and investment appraisal. This analysis among others needs to consider pricing of inputs and outputs, the planning horizon and project life, risks and uncertainties and distribution of responsibilities of stakeholders involved. It appears that UNDP missed this important step in preparation for the Chinar conversion.

8.2.1.4.7.2 Country commitment

731. The Government considered Chinar conversion as a priority project and provided its support by facilitating the customs clearance and waving taxes on imported production equipment. The NOU provided all the necessary organizational support to international consultants and the management of the enterprise during the implementation of the project. The Government is aware of economic difficulties experienced by the enterprise. However, the Government was not able to provide the necessary financial assistance to the enterprise due to lack of free capital and more urgent priorities. Currently, the enterprise is included in the privatisation plan.

8.2.1.4.7.3 Stakeholder involvement

732. The project involved directly the management of the enterprise at each step of its implementation as well as the NOU, the Government entities, UNOPS international consultants, UNDP Headquarters and its local office in Baku.

8.2.1.4.7.4 Financial planning

733. The budget covered all the necessary equipment and activities associated with conversion of the refrigerant and insulation foam production lines to replace CFC-12 and CFC-11 with HFC-134a

and cyclopentane alternatives respectively. The planning and management of the project ensured the proper flow of funds. The conversion was accomplished according to the established timetable with 11 months delay.

734. UNDP installed the additional isobutane refrigerant charging line equipped with the necessary safety features at the cost of about $300,000. Isobutane refrigerant, however, was never used in production of Chinar appliances. The management does not consider these expenditures fully justified.

735. The expected in-kind IOC co-financing could not be achieved as expected at $448,683. Due to low production after the conversion, IOC for six months period did not exceed $80,640.

736. The evaluators had no access to financial documentation to verify the breakdown of final actual project costs.

8.2.1.4.7.5 UNEP / UNDP Supervision and backstopping

737. The role of UNDP and UNOPS in supervising and backstopping of the project was described in the relevant Section above.

8.2.1.4.7.6 Co-financing and Project Outcomes & Sustainability

738. The management of the Government owned enterprise is struggling to survive. The enterprise is included into the privatisation plan attempting to attract an external investor. The sustainability of the company is uncertain.

8.2.1.4.7.7 Delays and Project Outcomes & Sustainability

739. There was a delay in the implementation of 11 months. The delay resulted in continuation of imports of CFCs for production at Chinar at the time when Azerbaijan was in non-compliance with Montreal Protocol targets (Table 29).

Table 29: Project ratings for Azerbaijan domestic refrigerator production

Criterion	Evaluator's Summary Comments	Rating
Attainment of project objectives and results (overall rating)	Not all the project objectives were attained	**MS**
Effectiveness	The conversion was completed with a delay of 11 moths and production of ODS-free appliances commenced albeit at about 6% of installed capacity. From socio-economic prospective, the project was not instrumental in making the enterprise profitable enough and successful on the market. The workforce was reduced by a factor of three. The future of the enterprise is uncertain.	**MS**
Relevance	All project outcomes are fully consistent with GEF strategy in ozone and climate focal areas. The objectives of the Chinar conversion project are incorporated into the Country Programme as a priority.	**S**

Criterion	Evaluator's Summary Comments	Rating
Efficiency	The ODP phase out claimed in the project was inconsistent with ODS consumption by the enterprise reported by the TEAP expert. Therefore, the attainment of the intended cost-effectiveness was questionable. The in-kind contribution by the enterprise was about 20% of the claimed co-financing.	**MS**
Sustainability of Project outcomes (overall rating)	Conversion to ODS-free technology is irreversible. The future of Chinar is uncertain. Project outcomes cannot be recognized as sustainable.	**MU**
Financial	The enterprise experiences problems with the cash flow. The project did not prove to be economically viable and sustainable. The company estimated that investment capital of $5.0 - 6.0 million was needed to bring the company back to full performance.	**MU**
Socio Political	The management of the enterprise could not reach the economically viable capacity utilization. The workforce was reduced by two third from the pre-project status. The Government included the enterprise in the privatization plan seeking an external investor.	**MU**
Institutional framework and governance	The conversion of Chinar was a priority project for the Government in meeting the Montreal Protocol targets. The Government was unsuccessful in supporting the enterprise financially and in adoption of legislation that banned the imports of ODS containing products.	**MU**
Environmental	The conversion of Chinar is irreversible and resulted in reduction of national CFC consumption albeit at a lower rate than planned.	**L**
Achievement of outputs and activities	The outputs related to the project execution have been delivered with 11 months delay. However, the enterprise did not reach economically viable production.	**MS**
Monitoring and Evaluation (overall rating)	The M&E activities were implemented in a satisfactory way.	**S**
M&E Design	The project design envisaged the monitoring of the implementation by backstopping officers in UNOPS and UNDP Montreal Protocol Unit. The operational supervision of the implementation and certification were assigned to international consultants.	**S**
M&E Plan Implementation (use for adaptive	The M&E plan was implemented with	**S**

Criterion	Evaluator's Summary Comments	Rating
management)	assistance from the NOU and international consultants.	
Budgeting and Funding for M&E activities	The budget had adequate resources to support monitoring and evaluation activities by UNDP/UNOPS staff and international consultants.	**S**
Catalytic Role	No catalytic effect was observed since Chinar was the only manufacturer of domestic appliances in Azerbaijan. UNDP gained experience that might be useful in implementation of similar projects elsewhere.	No ratings are requested for the catalytic role.
Preparation and readiness	The company made all the necessary construction work enabling the installation of equipment. The project design contains no financial and economic analysis and investment appraisal as part of preparation for the full-scale conversion.	**MS**
Country ownership / motivation	The Government attached a priority to the project but was unsuccessful in providing financial assistance and legislation support to ensure the economic sustainability of the plant.	**MU**
Stakeholders involvement	The project involved all relevant stakeholders in project preparation and execution.	**S**
Financial planning	The budget covered all the necessary equipment and activities associated with conversion of the refrigerant production line to replace CFC-12 with HFC-134a alternative. The planning and management of the project ensured the proper flow of funds. The expected in-kind co-financing was not accurately assessed. No financial provisions were allocated for conducting the financial and economic analysis and investment appraisal.	**MS**
UNEP Supervision and backstopping	According to enterprise management, UNDP and UNOPS fulfilled their supervisory and backstopping responsibilities.	**S**
Overall Rating	Not all the objectives of the project were met.	**MS**

8.2.1.5 AZE/98/G31 - Conversion of compressor manufacturing facility in Sumgayit (UNDP/UNOPS);

8.2.1.5.1 Background

740. The Sumgayit Compressor Manufacturing Plant (SCMP) was the only manufacturer of hermetic, refrigeration compressors in Azerbaijan. It was founded in 1972 and employed almost 1200 workers. All of the compressors manufactured by SCMP were sold in CEITs[76]. SCMP was the major supplier of CFC-12 hermetic compressors for Chinar domestic refrigerator manufacturer (UNDP project). The installed production capacity of SCMP was about 1 million compressors per

[76] Azerbaijan, Russia, Ukraine, Uzbekistan, Tajikistan, Moldova and Bulgaria

year. Total annual compressor sales declined from 976,000 (1993) to 100,000 (1996) units; and sales during the first six months of 1997 were 107,800 units. The reason for decline was attributed to SCMP's major clients moving to non-CFC compressors, compelling SCMP to develop their own manufacturing process based on HFC-134a and HC-600a (isobutane) technology. The evaluator was informed that the quality of Sumgayit compressors was not highly competitive in face of other compressor suppliers in the former Soviet Union such as "Atlant" (Baranovichi, Belarus) and "Oruva" (Mezikai, Lithuania). The rejection rate of Sumgayit compressors reached in some instances up to 20%[77].

741. The project on conversion of the Sumgayit compressor manufacturing plant was developed by UNDP/UNOPS experts in 1998. The objective of this project was to convert the manufacturing facilities at the Sumgayit Compressor Plant to enable the mass production of HFC 134a and HC 600a based compressors. This conversion would have facilitated the phase out of CFC 12 refrigerant in the manufacture of domestic refrigerators in Azerbaijan (Chinar in particular) and the countries of the region.

742. At the time of the formulation of the project, SCMP had already designed HFC-134a and HC-600a compressors itself. The plant invested $2.2 million to start trial production of non-ODS-based product. The SCMP investment covered the modification of the manufacturing process that enabled the production of HFC-13a and isobutane compressors. These investments could not, however, be reimbursed retroactively by the GEF according to its operational guidelines. UNDP and a national refrigeration expert assessed additional investment that would allow SCMP to reach the necessary quality standards and production levels that existed in 1993. The project document was signed in February 1999. The necessary capital cost items amounted to additional $2,399,738, which was provided by the GEF.

8.2.1.5.2 Attainment of objectives and planned results

8.2.1.5.2.1 Objectives, outputs, outcomes and performance indicators

743. The objectives of the Project are reflected in the Country Programme to convert SCMP to ODS free technology that would contribute to phase out of national ODS consumption. There was no direct impact in terms of ODP phase out anticipated from SCMP conversion. The phase out would have occurred at the level of the refrigerator manufacturers that would expectedly use SCMP compressors and charge the system with the non-ODS refrigerant. The direct impact in the country was expected once Chinar refrigerator manufacturing facility would have started using SCMP compressors. Theoretically, the indirect impact was assessed to be 200 ODP tonnes based on 1 million SCMP compressors used by refrigerator manufacturers.

744. This project objective was to enable the Sumgayit Compressor Manufacturing Plant producing all ranges of HFC 134a compressors comparable in capacity to the ones produced in the past, plus the production of low-range HC-600a compressors. This should allow the company to re-establish their past production volumes and market shares.

745. The evaluator was not able to visit the SCMP because the plant was permanently closed and no access was granted. The project document and the UNDP PIR have been the major source of information on objectives, outputs, outcomes and performance indicators. The outputs and planned activities are contained in the project implementation schedule that relate exclusively to the installation and commissioning of production equipment. The project document does not provide clear, consistent formulations of objectives in terms of expected improved quality indicators, and targets or baselines from which progress can be assessed. In the absence of the logframe for the evaluation of the Project, outcomes and performance indicators were inferred from intended outputs/deliverables contained in the UNDP project document. Thus, the 1993 production of 976,000 units mentioned in the project document is taken as a target for the evaluation purposes even it was not explicitly articulated in the project objectives (Table 30).

[77] Interview with the former director of Pamir domestic refrigeration plant

Table 30: Conversion of compressor manufacturing facility in Sumgayit: Objectives/ Intended Results - Outputs/Deliverables - Outcomes/Performance indicators

Objectives/Intended Results	Outputs/Deliverables	Outcomes/Performance indicators
1. The establishment of the mass production of HFC 134a and HC 600a based compressors at the Sumgayit Compressor Manufacturing Plant. The achievement of quality of SCMP product that would ensure its competitiveness at the market in Azerbaijan and other countries. The attainment of annual production of about 970,000 units .	1. Conversion of the Sumgayit Compressor Manufacturing Plant to enable the production of HFC-134a and isobutane compressors that are compatible with predetermined quality requirements Deliverables: Procurement of new production equipment; Delivery of new production equipment to the country; Installation of new production equipment;; Start up; Training of personnel; Trials/testing; Certification of major specifications; 2. Start of mass production.	1. The manufacturing facility is fully capable for mass production of HFC-134a and isobutane based compressors. The ODS-free production equipment is installed and commissioned; The Certificate of Completion is signed by all stakeholders; The manufacturing of ODS-free product is started; The new product is fully competitive on the local and outside markets. Major specifications such as cooling capacity, input power, condensing and evaporative temperature, weight, noise level are comparable or better than major competitive brands; Sales are sufficiently high to sustain the enterprise long term operation. 3 . The annual production is close to 970,000 units.

8.2.1.5.2.2 Effectiveness

746. By the time of the project formulation by UNDP, SCMP had developed its own design of HFC-134a and isobutane compressors and created capabilities for trial production. The SCMP staff had carried out some design changes. These changes are related to the difference in physical and thermodynamic properties between CFC 12 and HFC 134a. HFC 134a needs higher discharge and lower suction pressure that results in higher compression ratio, with loss of volumetric efficiency, higher mechanical stress, higher electricity consumption and higher noise level.

747. The changes in design entailed the change-over in the production and assembly processes for compressors and motors, as well as production line layout changes to accommodate limitations of new refrigerants and meet more stringent requirements to cleanness of finished product. This was essential for the successful manufacture of HFC 134a domestic refrigerators and freezers and changes to the compressor manufacturing process must also be made to meet these requirements. SCMP invested in machinery and equipment for production of cast iron and plastic parts, punching of valve plates and larger compressor shells, machining of cast iron parts, modernization of

electromotor production, retrofitting of assembly line, cleaning and phosphating of compressor shells and introduction of alkaline cleaning process replacing CFC-113 solvent.

748. The CSMP investment of $2,190,000 could be considered as incremental cost but GEF guidelines prevented the reimbursement of incremental costs retroactively. UNDP developed the project as Phase 2 of SCMP conversion that concentrated on providing capabilities of mass production (about 970,000 units per year) and reaching the necessary quality standards that would enable SCMP to re-establish its position on the national and outside market. The project included funding of $2,398,000 for the procurement of additional production equipment for machining of iron cast parts (cylinders, pistons, crankshafts), induction casting furnace, alkaline washing plant, dry painting plant replacing trichloroethylene based system, vacuum dehydration plant, thermoplastic casting unit, oil drying and charging unit, calorimeter and quality testing equipment. The project covered the cost of technology transfer and training of CSMP personnel. The implementation of the project started in February 1999 and was scheduled for 24 months.

749. UNDP/UNOPS organized the international bidding for equipment suppliers, selected vendors, organized delivery of equipment to the country and its customs clearance, provided installation and commissioning of machinery and equipment, training of personnel involved in the production process and trial runs of installed and commissioned equipment. SCMP commenced the production of non-ODS compressors. The UNDP/UNOPS evaluation mission was organized to Azerbaijan to sign the Certificate of Completion. The project was completed in January 2002 with 11 months delay against the approved schedule.

750. The SCMP product did not prove to be competitive on the market. Many employees of SCMP left the enterprise. The production did not exceed several thousand units. Chinar, the major buyer of SCMP product has drastically reduced its production and eventually switched to compressors supplied by Belarus and France. About 98% ownership of SCMP belonged to the Government. The company tried to restructure its operations but it incurred debts and cash flow problems because of low sales. SCMP was forced into receivership and has been under bankruptcy protection.[78] There were several tender attempts to sell the troubled firm's assets to potential investors. The plant was sealed at the time of the evaluation mission which prevented access to the plant. The future of the plant is uncertain.

751. It appears that UNDP/UNOPS underestimated the SCMP capability and its market potential in the very competitive and volatile global compressor manufacturing industry. The targets of the annual production of 970,000 units proved to be unjustifiably ambitious. Such a high output of the enterprise in 1980th was only possible because of the closed market in the centralized economy in the former Soviet Union. The new economic situation dictated more prudent and systematic approach. UNDP had to conduct the investment appraisal through the financial and economic analysis of the viability of the enterprise, including analysis of structure of costs and income projections, evaluation of annual and accumulated financial net benefits (profitability, efficiency of investment) and assessment of specific project risks. Once determined, these critical variables would indicate on the probability of the success of the GEF investment.

752. The target of improving the quality of SCMP compressors was not articulated in the project document by presenting the baseline and specifications to be achieved as a result of the project such as cooling capacity, input power, coefficient of performance, condensing and evaporative temperature, weight, noise level. Upon completion of the project, UNDP did not provide information demonstrating the comparison of baseline and achieved specifications of SCMP product.

753. In conclusion, the execution of the project was proceeding according to the schedule with a delay about 11 moths. The conversion was completed and the production of ODS-free compressors commenced in 2002 albeit at the very low output. However, the production was stopped shortly after and the enterprise was financially broken. The claimed targets of annual production of 970,000 units of high quality compressors were not achieved. There was no direct or indirect impact of the project in terms of ODP phase out in the country. UNDP made no feasibility study of the GEF investment. Two out of three established objectives have not been attained.

[78] Journal of Electro Technology Market, 19. 04. 2007, http://www.marketelectro.ru/news/4983/

8.2.1.5.2.3 Relevance

754. The project was a priority for the country ODS phase out programme. The objectives of the project were consistent with GEF operational guidelines in ozone and climate focal areas.

8.2.1.5.2.4 Efficiency

755. The project was implemented by UNDP/UNOPS in the period from February 1999 until January 2002 with 11 months of delay against the approved schedule. Within 35 months, the enterprise was able to start manufacturing of HFC-134a compressors but shortly after the production was stopped on the economic ground. Most of employees left the enterprise. The workforce was reduced to 214 employees in 2007.

756. In general, the cost-effectiveness of projects on conversion of compressor manufacturing facilities cannot be assessed in $/kg ODP since compressor production does not involve the direct use of ODS. The local availability of efficient non-ODS-based compressors at a competitive price may, however, facilitate the ODS phase out in the refrigerator manufacturing and servicing sectors. The project failed to bring SCMP HFC-134a and isobutane compressors to the market in Azerbaijan and elsewhere. The enterprise is not working. The future of assets acquired with the GEF funds is uncertain. The project was not effective from the socio-developmental prospective because many jobs disappeared with the closure of production. The efficiency of the project is close to zero.

757. Some of production equipment included in the project was not critical or related to conversion from CFC-12 to HFC-134a refrigerant (such as dry painting system of $160,000) and its funding eligibility by the GEF is questionable.

8.2.1.5.3 Assessment of Sustainability of project outcomes

8.2.1.5.3.1 Financial resources

758. The financial resources provided by GEF of $2,190,000 covered fully the capital cost of the Phase 2 conversion. Together with the enterprise investment, the total cost of the project was $4,588,000 that was the most expensive project in the compressor manufacturing sector funded by the GEF or the MLF. The outcomes of the project proved to be unsustainable. The limited demand and low sales resulted in insoluble economic and financial problems. The enterprise was shut down and forced into receivership, and has been under bankruptcy protection since then. The Government advertised several tenders to sell SCMP assets (building, equipment, plot of land of 17.6 hectares). The total value of shares proposed for the 2007 tender was $3.8 million plus about $1 million should be paid to the state budget. The future of the company is still uncertain.

759. There were many very competitive players in the compressor manufacturing industry at the time of the SCMP project formulation by UNDP. Given the background of SCMP, the technical specifications, its low capacity utilization (about 10%) in 1997-1998, UNDP would have to carefully assess all the risks of the investment in the SCMP conversion. Such risks could be assessed by conducting the financial analysis and investment appraisal study. The GEF budget included $176,000 for executing agency support costs, $25,000 for technology transfer/technical advisory service, $22,000 for project support services and $200,000 contingency that could be used for commissioning industry experts to prepare such a study.

8.2.1.5.3.2 Socio-political

760. The enterprise was 98% owned by the Government. The conversion of SCMP was a priority project in the National ODS Phase out Programme. However, the Government was not successful in good management of assets provided by the GEF to make the enterprise economic viable and sustainable. The workforce of the enterprise was reduced from 1,200 to about 200 employees. The enterprise is included in the privatisation plan seeking an external investor.

8.2.1.5.3.3 Institutional framework and governance

761. The Government and NOU provided the necessary support to the management of the enterprise during the implementation of the conversion. The NOU was actively interacting with the State Customs Committee to ensure the timely clearance of imported production equipment. The

project has not clearly articulated the role of Government in making the outcomes of the project sustainable. The Government management did not prove to be effective in maintaining and strengthening the sustainability of the enterprise and outcomes of the project. Currently, the Government is seeking an opportunity to transfer its ownership to external private investors and get contribution to the state budget.

8.2.1.5.3.4 Environmental

762. The traditional user of SCMP compressors in Azerbaijan was the refrigerator manufacturer Chinar. Chinar switched to HFC-134a refrigerant in January 2002 with assistance from UNDP. SCMP was not capable to meet demand of Chinar with its quality of HFC-134a compressors at competitive prices. In 2002, the production at Chinar was about 10,000 refrigerators. Chinar purchased their HFC-134a compressors from France and Belarus. The conversion of SCMP had no noticeable impact on the ODS phase out process in the country because of very low output and brief period of production. After the closure of SCMP, the demand in non-ODS compressors at Chinar and in the servicing sector in the country has been continuously met through imports from leading international compressor suppliers.

8.2.1.5.4 Catalytic role

763. SCMP was the only compressor manufacturer in Azerbaijan. No replication or catalytic effect of the project was identified. The negative experience of SCMP conversion might be useful for UNDP/UNOPS and the Government.

8.2.1.5.5 Achievement of outputs and activities

764. The outputs related to the project execution (procurement, delivery and installation of new production equipment, start up, training, trial production of new product, and certification) have been delivered with a delay of 11 months. However, the new product did not prove to be competitive and shortly after the enterprise was declared bankrupt. The targeted production level was not achieved. The section on Effectiveness provides detailed information on outputs and achieved outcomes.

8.2.1.5.6 Assessment of Monitoring and Evaluation Systems

8.2.1.5.6.1 M&E design

765. In general, the M&E design does not meet GEF minimum requirements in terms of using SMART indicators. The M&E plan is represented by the project implementation schedule having time-bound indicators. This schedule reflects the timing of major steps of conversion. The project design envisaged the monitoring of the implementation by backstopping officers in UNOPS and UNDP Montreal Protocol Unit. The international and local consultants were assigned to develop the conversion plan that was agreed with the Government and management of the enterprise. The implementation of the plan was supervised by the same international consultant in cooperation with the NOU and the UNDP local office. The project envisaged also a mission of a UNOPS consultant to make the final evaluation and sign the Certificate of Completion.

766. The objective of Phase 2 conversion was to achieve production of about 970,000 units of good quality compressors. Albeit the implementation schedule contained activities for “mass production change in the last six months”, the M&E design could not ensure the monitoring of achievement of targeted full scale production. To do so, the monitoring would have to continue for the period of at least twelve months upon completion of conversion. Similarly, the M&E system was not designed to supervise the quality of the SCMP product. The baseline and targeted specifications of SCMP compressors were not articulated in the project document.

767. The M&E design did not include the monitoring of economic and financial variables that would determine the viability of GEF investment and the prospects of sustainable operation of the enterprise.

8.2.1.5.6.2 M&E plan implementation

768. According to the project implementation schedule the start up production of alternative products was scheduled in 24 months after the approval of the GEF grant. The enterprise commenced production of ODS-free appliances in 35 months after the date of approval of the

project (January 2002). According to the UNDP PIR, the international and local consultants supervised the implementation and visited the project site providing the necessary expertise in planning, installation of production equipment and certification of the completion of conversion in January 2002. UNDP was not able to provide monitoring and evaluations reports of its consultants to the evaluation team, including Hand over Protocol. Due to its serious limitations, the M&E plan could not ensure the tracking of all anticipated results.

8.2.1.5.6.3 Budgeting and Funding for M&E activities

769. The budget of the project provided sufficient resources for monitoring, evaluation and supervisory activities through the following allocations: $176,000 for executing agency support costs, $25,000 for technology transfer/technical advisory service, $22,000 for project support services and $10,000 for evaluation mission. All these resources were readily available. The allocated funds appear to be sufficient for expansion monitoring activities by inclusion of M&E of economic and financial variables.

8.2.1.5.6.4 Long-term Monitoring

770. The long term monitoring was not envisaged in the project. The responsibilities of executing agencies came to an end upon signing the certificate of completion. A short time later, the NOU ceased to exist. The monitoring of SCMP was not part of responsibilities of the Ozone Office re-established by the Government in 2003.

8.2.1.5.7 Assessment of processes that affected attainment of project results

8.2.1.5.7.1 Preparation and readiness

771. The design of the UNDP project on conversion of SCMP is not typical. The Government and the management of SCMP realized the necessity of transition to non-ODS product several years prior to the GEF intervention in Azerbaijan. The SCMP engineering team determined the necessary changes in the compressor design and the impact on the production process of HFC-134a compressors as follows: to increase the stroke and reduce the bore for reducing the dead volume; reduce the valve plate thickness; to change the diameters of suction holes for increasing the refrigerant flow; to reduce the thickness of blanking punch in the suction valve; to adopt the semi direct suction by means of a plastic muffler resulted in increase of the HFC-134a refrigerant mass flow; to increase power of the electric motor; to ensure more stringent cleanliness requirements. For production of isobutane compressors, new sparkles starting relays were necessary. Isobutane refrigerant has much lower volumetric cooling capacity than CFC-12 that entails the requirement to enlarge the displacement and the physical size of the compressor in order to maintain the equivalent capacity . There was a limited possibility to increase the displacement and the size of the crankcase. This implied that only low capacity range isobutane compressors could be manufactured.

772. By the time of the project formulation, the management of SCMP had already accomplished the work on new design of HFC-134a and isobutane compressors and created capabilities for production of new non-ODS compressors by procurement and commissioning of production equipment for manufacturing of cast iron and plastic parts, punching of valve plates and larger compressor shells, machining of cast iron parts, modernization of electromotor production, retrofitting of assembly line, cleaning and phosphating of compressor shells and introduction of alkaline cleaning process replacing CFC-113 solvent.

773. UNDP formulated its project as Phase 2 of conversion with the objectives of enhancing productivity and quality of non-ODS compressors providing equipment for iron casting, machining of cylinders and pistons, manufacturing of plastic parts, alkaline washing system, quality and performance testing equipment. Some of this equipment (manufacturing of iron cast and plastic parts) was part of SCMP investment. The procurement of new dry painting system was not related to conversion to non-ODS refrigerants. The project document does not provide adequate justification of why this equipment was essential for conversion to non-ODS technology. It appears that the project has clearly demonstrated the developmental features. However, the project did not establish the baseline and targeted specifications of SCMP product that would have allowed monitoring of the achievement of targeted quality of new non-ODS compressors.

774. The most critical drawback of the preparation phase of the project was the absence of the prior

compressor market assessment and the investment appraisal through the financial and economic analysis of the viability of the enterprise, including analysis of structure of costs and income projections, evaluation of annual and accumulated financial net benefits (profitability, efficiency of investment) and assessment of specific project risks. This work would have to be implemented in close cooperation with the Government and the management of the enterprise. The lack of this assessment of these critical variables predetermined in many ways the failure of the project.

8.2.1.5.7.2 Country commitment

775. The Government considered the SCMP conversion as a priority project in conjunction with the conversion of Chinar refrigerator manufacturing facility and provided its support by facilitating the customs clearance and waving taxes on imported production equipment. The NOU provided all the necessary organizational support to international consultants and the management of the enterprise during the implementation of the project. The Government was not successful in determining the critical financial and economic parameters in managing the assets provided to SCMP by the GEF. The Government was aware of economic difficulties experienced by the enterprise. However, the Government was not able to create the favourable environment and provide the necessary financial assistance to the enterprise. Currently, the enterprise is included in the privatisation plan.

8.2.1.5.7.3 Stakeholder involvement

776. The project involved directly the management of the enterprise at each step of its implementation as well as the NOU, the Government entities, UNOPS international consultants, UNDP Headquarters and its local office in Baku. The UNDP and Government did not involve the relevant experts for determining the critical financial and economic parameters to ensure the success of the project.

8.2.1.5.7.4 Financial planning

777. The budget covered the procurement, installation, commissioning and start up of production equipment and activities associated with Phase 2 conversion. The planning and management of the project on part of UNDP and UNOPS ensured the proper flow of funds. The conversion was accomplished according to the established timetable with 11 months delay. The Government was not able to devise a realistic long term financial plan and provide the necessary financial assistance to the enterprise to maintain the production upon completion of the project. The production stopped shortly after the closure of the project. Currently, the enterprise is included in the privatisation plan.

778. The evaluators had no access to financial documentation to verify the final actual project costs. The evaluation team considered that the financial planning for SCMP conversion project by UNDP/UNOPS was inadequate as it reduced the funding for other potential projects in other countries that could have much more effective in terms of ODS phase out.

8.2.1.5.7.5 UNEP / UNDP Supervision and backstopping

779. The role of UNDP and UNOPS in supervising and backstopping of the project is described in the relevant Section above. UNDP/UNOPS was not able to provide the documentation demonstrating their supervising and backstopping role in the implementation of the project.

8.2.1.5.7.6 Co-financing and Project Outcomes & Sustainability

780. The company investment to the conversion amounted to $2,190,000. The management of the enterprise on the part of Government was not successful to maintain the production upon completion of the project. The company tried to restructure its operations but it incurred debts and cash flow problems because of low sales. The production was stopped and SCMP was forced into receivership. The enterprise is included into the privatisation plan attempting to attract an external investor. The future of the company is uncertain.

8.2.1.5.7.7 Delays and Project Outcomes & Sustainability

781. There was a delay in the implementation of 11 months. The commissioning of equipment and start of production of non-ODS compressors coincided with commencement of production of

non-ODS refrigerators at Chinar that was the major user of SCMP compressors in the past. SCMP compressors did not prove to be competitive in terms of price and quality, and Chinar switched to compressors imported from France and Belarus. The 11 months delay in the implementation of the project has not played a critical role because of availability of non-ODS compressors at the international market. The Ratings for the compressor project are shown in Table 31.

Table 31: Project ratings for compressor production in Azerbaijan

Criterion	Evaluator's Summary Comments	Rating
Attainment of project objectives and results (overall rating)	The project had major shortcomings in the achievement of its objectives	**U**
Effectiveness	The conversion was completed with a delay of 11 moths and the production of ODS-free compressors commenced in 2002 albeit at the very low output. The production was stopped shortly after the closure of the project and the enterprise was financially broken. The claimed targets of annual production of about 970,000 units of high quality compressors were not achieved. The future of the enterprise is uncertain. There was no direct or indirect impact of the project in terms of ODP phase out in the country. UNDP made no feasibility study of the GEF investment.	**U**
Relevance	The objectives of the SCMP conversion project were incorporated into the Country Programme as a priority and fully consistent with GEF strategy in ozone focal area. The outcomes of the project had insignificant impact on ODS phase out in the country.	**U**
Efficiency	ect failed to bring ODS-free compressors to the market in Azerbaijan and elsewhere. The enterprise stopped production shortly after the completion of the project. The future of assets acquired with GEF funding is uncertain. The project was not effective from the socio-developmental prospective because many jobs disappeared with the closure of production. The efficiency of the project is close to zero.	**U**
Sustainability of Project outcomes (overall rating)	The outcomes of the project proved to be unsustainable. The limited demand and low sales of SCMP compressors resulted in insoluble economic and financial problems and eventually in bankruptcy of the enterprise.	**U**
Financial	The financial resources provided by GEF together with the enterprise investment covered fully the capital cost of the conversion. Upon completion of the project, the enterprise experienced serious problems	**MU**

Criterion	Evaluator's Summary Comments	Rating
	with the cash flow and has been under bankruptcy protection since then. The Government advertised several tenders to sell SCMP assets. The future of the company is still uncertain.	
Socio Political	The enterprise is owned by the Government. The conversion of SCMP was a priority project in the National ODS Phase out Programme. However, the Government was not successful in good management of assets provided by the GEF to make the enterprise economic viable and sustainable. The workforce of the enterprise was reduced from about 1,200 to 200 employees. The enterprise is included in the privatisation plan seeking an external investor.	**MU**
Institutional framework and governance	The Government and NOU provided the necessary support to the management of the enterprise during the implementation of the conversion. The Government ownership did not prove to be effective in maintaining and strengthening the sustainability of the enterprise and outcomes of the project. Currently, the Government is seeking an opportunity to transfer its ownership to external private investors.	**U**
Environmental	The conversion of SCMP had a minor impact on the ODS phase out process in the country because of very low output and brief period of production. After the closure of SCMP, the demand in non-ODS compressors at Chinar and in the servicing sector in the country has been continuously met through imports from leading international compressor suppliers.	**U**
Achievement of outputs and activities	The outputs related to the project execution have been delivered with 11 months delay. However, the enterprise did not reach economically viable output and production was stopped.	**U**
Monitoring and Evaluation (overall rating)	The M&E activities were implemented in a satisfactory way.	**MU**
M&E Design	The M&E design does not meet GEF minimum requirements in terms of using SMART indicators. The M&E plan is represented by the project implementation	**MU**

Criterion	Evaluator's Summary Comments	Rating
	schedule having time-bound indicators. The M&E design could not ensure the monitoring of achievement of targeted full scale production and supervision of the quality of the SCMP product. The baseline and targeted specifications of SCMP compressors were not articulated in the project document. The M&E design did not include the monitoring of economic and financial variables that would determine the viability of GEF investment and the prospects of sustainable operation of the enterprise.	
M&E Plan Implementation (use for adaptive management)	As designed, the M&E was implemented at a satisfactory level with assistance from the NOU and international consultants. Due to its intrinsic limitations, the M&E plan could not ensure the tracking of all anticipated results.	**MU**
Budgeting and Funding for M&E activities	The budget had adequate resources to support monitoring and evaluation activities by UNDP/UNOPS staff and international consultants. No allocations were provided for monitoring economic and financial variables.	**MU**
Catalytic Role	No catalytic effect was observed since SCMP was the only manufacturer of compressors in Azerbaijan. UNDP gained experience that might be useful in implementation of similar projects elsewhere.	No ratings are requested for the catalytic role.
Preparation and readiness	UNDP formulated its project as Phase 2 of conversion with the objectives of enhancing productivity and quality of non-ODS compressors. The project did not establish the baseline and targeted specifications of SCMP product related to required quality of new non-ODS compressors. The project design contains no financial and economic analysis and investment appraisal that was crucial in many ways for determining the future of the project. The project document does not provide adequate justification of the necessity of some equipment for conversion to non-ODS technology.	**U**
Country ownership / motivation	The Government attached a priority to the project but was unsuccessful in the management of the enterprise upon completion of the conversion.	**MU**
Stakeholders involvement	The project involved all relevant stakeholders in project execution. UNDP and the Government failed to involve relevant	**MU**

Criterion	Evaluator's Summary Comments	Rating
	experts for financial and economic appraisal of the investment in project's design.	
Financial planning	The planning and management of the project on part of UNDP and UNOPS ensured the proper flow of funds for the successful completion of conversion. The Government was not able to devise a realistic long term financial plan and provide the necessary financial assistance to the enterprise to maintain the production upon completion of the project.	**MU**
UNDP Supervision and backstopping	In the absence of relevant documentation, it is not possible to evaluate the role of UNDP in supervision and backstopping.	
Overall Rating	The project had major shortcomings in achievements of stable production of good quality product.	**U**

8.2.1.6 AZE/98/G34- Halon management and banking national recovery/recycling centre (UNDP/UNOPS);

8.2.1.6.1 Background

782. In 1996, Azerbaijan reported its halon consumption of 501.2 ODP tonnes. Later, it was determined that this amount might rather constitute halons banked in fire-fighting equipment. In 1997, halon consumption was reported of 25.8 ODP tonnes. In 1998, the UNDP consultant involved in the project preparation determined that consumption of halons in Azerbaijan had been difficult to quantify to any acceptable degree of accuracy. Total consumption, however, from the years 1972 to 1991 was estimated to be 50 metric tonnes of Halon 1211, 100 metric tonnes of Halon 2402 and 5 metric tonnes of Halon 1301 that corresponded to 150 ODP tonnes, 600 ODP tonnes and 50 ODP tonnes respectively.

783. Prior to the breakup of the Soviet Union in 1991, access to halons, particularly Halon 2402, was through two separate manufacturing plants based in Russia. Supply of Halon 1211 was primarily from Russia with some product being imported from the Middle East and Turkey.

784. The first draft of the country program established that all CFCs and halons consumption would be phased out by the year 2000 through active co-operation between industry and the Government. By the Presidential Decree, the ban was introduced on imports and exports of halons in 1997. In 1998, zero halons consumption was reported to the Ozone Secretariat. The Azerbaijan State Fire Department, through the internal affairs and environment ministries, has played an active role in the halon phase-out program. The country program stated that there was no halon bank in the country and strongly recommended the establishment of such an operation with the assistance of the GEF. It was recognized that the provision of a halon recovery/recycling facility should be the most essential activity to be undertaken in Azerbaijan.

785. In February 1999, UNDP approved the project on Halon management and banking national recovery/recycling centre with the GEF funding of $135,259.

8.2.1.6.2 Attainment of objectives and planned results

8.2.1.6.2.1 Objectives, outputs, outcomes and performance indicators

786. The objectives of the project included the set up of a national halon recovery/recycling centre in Azerbaijan equipped with the necessary laboratory equipment to carry out quality tests of recovered and reclaimed halons. As part of the overall halon management package, this project also included the collection of data on halon use and conducting an instructional workshop/seminar for all key stakeholders involved in the phase-out process.

787. The Ozone Office was not able to organize a visit to the Force Major Ministry which is responsible for the Fire Fighting Service in the country. The project document and the UNDP PIR have been the major source of information on objectives, outputs, outcomes and performance indicators. The outputs and planned activities are contained in the project description and implementation schedule that incorporated all the major steps of the execution of the project. Except overall ODS phase out target of 100 ODP tonnes, the project document does not provide quantitative targets or baselines from which progress can be assessed. In the absence of the logframe for the evaluation of the Project, outcomes and performance indicators were inferred from intended outputs/deliverables contained in the UNDP project document (Table 32).

Table 32: Halon management and banking national recovery/recycling centre: Objectives/ Intended Results - Outputs/Deliverables - Outcomes/Performance indicators

Objectives/Intended Results	Outputs/Deliverables	Outcomes/Performance indicators
1. The establishment of a realistic status of the firefighting sector in the country	1. A survey conducted by the international consultant in cooperation with the NOU and local experts.	1. The establishment of the database on: Users of halon systems and quantity of halons contained in installed equipment and stock; Firefighting equipment manufacturers; Firefighting equipment installers. 2. Establishment of critical applications in key segments such as defense, civil aviation, sea transportation, offshore oil and gas exploration Submission of halon critical use nomination by Azerbaijan to the Halon TOC; 3. Raising awareness about new technology using halon alternatives among Government officials, halon end-users, manufacturers and installers of firefighting equipment. Number of new system performance standards developed and adopted; Number of new halon-free firefighting systems installed in the country; 4. Sustainable operation of R&R centre. Availability of recovered and recycled halons in quantities sufficient for maintaining the existing firefighting systems (target 100 ODP tonnes). Reduction
2. Communication of information on environmentally suitable halon alternatives to major stakeholders.	2. Organization of the workshop for Government officials, halon end- users, manufacturers and installers of firefighting equipment. Number of participants in the workshop.	

Objectives/Intended Results	Outputs/Deliverables	Outcomes/Performance indicators
		of halons emissions. Collection of contaminated halons for future destruction.
3. To maintain existing firefighting capabilities in Azerbaijan through supply of recovered and recycled halons. Reduction of halon emissions into atmosphere.	3. Establishment of a national halon recovery/recycling centre. Deliverables: Procurement of R&R and quality control equipment; Delivery of R&R and quality control equipment to the country; Installation of R&R and quality control equipment;; Trials, training and certification of personnel; Evaluation mission for the certification of project completion.	Quantities of recovered and recycled Halon 2402 and Halon 1211; Quantities of halons collected for future destruction.

8.2.1.6.2.2 Effectiveness

788. UNDP involved an international expert for the preparation of the halon project in Azerbaijan. The international expert determined that Halon 2402 was a major fire fighting agent used in stationary systems and Halon 1211 used in portable fire extinguishers. There was no reliable data on quantities of halons contained in fixed systems and the number of portable Halon 1211 fire extinguishers. There were no local manufacturers of Halon 1211 fire extinguishers. One company was identified manufacturing a small range of dry chemical powder fire extinguishers under license from a Turkey based company. This particular enterprise had been in operation for less than 18 months. A comprehensive survey of the sector was required to establish major halon end-users and determine the stock of available halons. The survey of the halon sector was conducted as a first priority measure.

789. The knowledge about new alternative halon-free technologies was limited in fire fighting community in Azerbaijan. The consultant identified only one company with fire engineering capabilities which had a license to operate in Azerbaijan. The issuing of permissions for new applicants was challenging in the absence of criteria and standards to be developed for assessment of new alternative fire fighting systems. The development of new standards required international assistance.

790. The workshop on new fire fighting technologies was conducted with the participation of all major stakeholders prior to creation of the halon recovery and recycling centre.

791. The establishment of the centralized national recovery/recycling and storage centre was considered as an important element of the National Halon Management Plan. The State Fire Fighting Department (SFFD) was identified as being the operator of the recovery and recycling centre capable of handling Halon 1211 and Halon 2402. The State Fire Department has been allocated a 16 hectare testing site that was used as a location of the recovery and recycling facility. The budget envisaged procurement and installation of halon reclamation system complete with scales, infra red heater unit, test sampling cylinder, pipe work, hoses, heat sink, core dryer, bench heater, pumping station and power controller. To avoid the risk of

contamination of large amounts of halons, several storage tanks of differing sizes have been provided. The portable gas chromatograph was included in the list of equipment to check the quality of incoming feed stock to ensure

792. Halon 2402 has about twice as much working pressure as Halon 1211. The document prepared for potential suppliers indicated that the Halon 2402 recovery/recycling station could either be provided as an additional machine designed for this purpose or by upgrading the unit initially designed for Halon 1211 to handle Halon 2402. It is not known what solution was eventually selected. UNDP was not able to provide any supportive documentation to the evaluation team due to the breakdown in the computer database.

793. The project document indicated to a serious problem with the existing fixed fire fighting systems. The effect of the halon import ban and the shortage of funds for purchasing halons by owners of these systems resulted in severe shortage of raw stocks of halon available in the country. It was estimated that about one third of both existing installed halon flooding systems and portable halon extinguishers were empty and unable to be refilled. Some of these systems were regarded as being of critical use that allowed for a purchase of limited quantities of halos with permission from Halon TOC. The survey and workshop components were considered as an important tool in assisting the Government and stakeholders involved to identify critical use applications and purchase the required halon quantities (virgin or recycled).

794. There is no information that the Government of Azerbaijan applied for halon critical use nominations to the Halon TOC.

795. It was not possible to obtain any meaningful information on the outcomes of this project. Neither the former NOU officer appointed in 2003 nor the currently acting head of the Ozone Office were familiar with the activities undertaken under this project. The status of the recovery and recycling equipment delivered to the country is not known. The UNDP project implementation report on Azerbaijan Country Programme contains very brief information indicating that "*The objective of the project was to set up a national halon product R/R centre to provide a basis by which access to halon can be made available to service and maintain fixed flooding fire protection systems and fire extinguishers*. *The project was completed in June 2001."* No other pertinent information is available in the UNDP Montreal Protocol Unit. The Ozone Office was not successful in making arrangements for the evaluator's visit to the State Fire Department currently operating under the Force Major Ministry to obtain the first-hand information about the project.

796. The communication of 17 April 2008 was received in CCCO from the Force Major Ministry. It was reported that no halon was used in fire fighting systems in Azerbaijan. In the same year, the CCCO received information from the Caspian Sea Navigation Office indicating that the total quantity of fire fighting agent was 40,316 metric kg in fire suppression systems installed on 40 ships, including 10,885 metric kg (65.3 ODP tonnes) of Halon 2402. The use of halons in Azerbaijan requires further investigation.

797. In recent years, British Petroleum and other multinational companies greatly enhanced their oil exploration operations in Azerbaijan. Reportedly, all newly installed fire-fighting systems are based on alternative non-halon fire suppression agents in accordance with the Montreal Protocol requirements.

798. In the absence of pertinent information, it is extremely difficult to evaluate the effectiveness of the project and achievement of outcomes using achievement indicators formulated in Table 11 above. Thus, it is not known whether the database on the fire-fighting sector was created (and what quality) as a result of the survey conducted under the project. The former NOU left no evidence of the database existence to the newly Ozone Office established in 2003. There is no information available on critical applications of halons in Azerbaijan. The information on no-use of halons provided by the Force Major Ministry might indicate that new environment friendly alternatives have been introduced into fire-fighting sector and, therefore, new standards were developed and approved. Implicitly, these developments might indicate to a positive effect of the workshop conducted by UNDP. As far as the halon recovery and recycling system is concerned, there is no evidence that this component contributed to the undertaking of maintaining the existed halon based fire-fighting equipment. No data is available on quantities of recovered and recycled halons. The halon banking centre could play a role of a receiving centre

for surrendered halons for storage and future destruction. However, the current status of the centre and equipment provided by UNDP is not known. There is a major risk that about 65.3 ODP tonnes of halons contained in ship fire-fighting systems might be released into the atmosphere.

799. In conclusion, there are implicit indications that only one out of three objectives of the project was attained. There is no information that might prove the attainment of two other objectives.

8.2.1.6.2.3 Relevance

800. The project was a priority for the country ODS phase out programme. The objectives of the project were consistent with GEF operational guidelines. However, there is no evidence that project outcomes contributed to the attainment of established objectives and the wider portfolio of the GEF.

8.2.1.6.2.4 Efficiency

801. According to the UNDP PIR, the project was implemented by in the period from February 1999 until January 2002 with 11 months of delay against the approved schedule. The effectiveness of the halon banking centre is dependent on the market forces, supply/demand and halon prices, and efficiency of operations. The cost-effectiveness of the project was determined to be $1.35/kg ODP on the basis of the targeted recovery and recycling of 3 metric tonnes of Halon 1211 and 15 metric tonnes of Halon 2402, in total about 100 ODP tonnes. There are no records available that could confirm any impact of the project in terms of recovered and reused halons. Likewise, no information is available on market conditions and efficiency of R&R operations. It is not possible to establish the actual cost-effectiveness and efficiency of the project.

802. The project did not envisage any contribution of cash or in-kind on the part of the Government.

8.2.1.6.3 Assessment of Sustainability of project outcomes

8.2.1.6.3.1 Financial resources

803. The financial resources provided by GEF of $135,259 covered the cost of equipment, installation and training of personnel of the halon recovery/recycling centre, conducting halon use survey and data collection, and organization of the instructional workshop/seminar incorporating training and education. The budget included allocations of $10,000 for the UNDP evaluation mission to certify the completion of the project.

804. The R&R operations by the State Fire Fighting Department (SFFD) were based on self-financing using market mechanisms in dealing with halon end-users. The project does not contain economic and financial analysis of sustainable halon recovery and recycling operations. No data have been made available about the prices of Halon 1211 and Halon 2402, availability of halons for recovery/recycling in Azerbaijan, the cost of transportation and other costs involved that could help in determining the cost/benefit ratio and the economic sustainability of the project in general.

805. No funds had been provided for monitoring of halon recovery and recycling operations upon completion of the installation and commissioning of equipment. Since the NOU ceased to exist shortly after the closure of the halon project, no data have been made available to confirm the success and sustainability of the outcomes of the project.

8.2.1.6.3.2 Socio-political

806. The Ozone Office provided data on the current use of halons in Azerbaijan that proved to be rather controversial. This indicates a lack of communication between the major stakeholders. For the same reason, no information is available in the NOU on the present status of the halon recovery/recycling facility.

8.2.1.6.3.3 Institutional framework and governance

807. The Government and NOU provided the necessary support to UNDP and UNOPS during the implementation of the project. The NOU was actively interacting with the State Customs Committee to ensure the timely clearance of imported R&R equipment. The project has not clearly articulated the role of Government and other stakeholders in making the outcomes of the project sustainable. In Azerbaijan, there is no legislation imposing mandatory recovery and

recycling of halons that affected negatively the sustainability of outcomes of the project. It appears that the presence of multinationals in the Azerbaijan petroleum industry was instrumental in bringing the non-ODS fire-fighting technology.

8.2.1.6.3.4 Environmental

808. Neither UNDP nor the NOU were able to provide evidences of environmental impact of the project in terms of recovered and contained quantities of halons. The availability of about 65.3 ODP tonnes of Halon 2402 was reported as banked in fire-fighting systems in ships operating in the Caspian Sea. In the absence of the effective system of recovery/recycling, safe storage and eventual destruction of halons in Azerbaijan, there is a significant environmental risk of the release of halons into atmosphere.

8.2.1.6.4 Catalytic role

809. There is no information regarding any other initiatives on halon recovery and recycling activities in the country. The workshop component raised awareness about alternative technologies among the fire-fighting community and facilitated indirectly the introduction of new technologies especially in the petroleum industry.

8.2.1.6.5 Achievement of outputs and activities

810. According to the UNDP PIR, the outputs related to the execution of the recovery/recycling component (procurement, delivery and installation of new equipment, training, and certification), and database and workshop components have been delivered with a delay of 11 months. However, there is no evidence of any effect or outcomes related to these activities.

8.2.1.6.6 Assessment of Monitoring and Evaluation Systems

8.2.1.6.6.1 M&E design

811. In general, the M&E design does not meet GEF minimum requirements in terms of using SMART indicators. The M&E plan is represented by the project implementation schedule having time-bound indicators. The project document contains the schedule reflecting the timing of all major steps in the execution of the project components such as database, workshop and recovery/recycling components. The project design envisaged the monitoring of the project implementation by backstopping officers in UNOPS and UNDP Montreal Protocol Unit. The international consultant was assigned to prepare and conduct the workshop, to supervise the execution the R&R component, and to certify its completion in cooperation with the NOU and the UNDP local office. To this effect, the project envisaged an evaluation mission of a UNOPS consultant to make the final evaluation and sign the Certificate of Completion.

812. In order to ensure the achievement of the established target of 100 ODP tonnes, the monitoring would have to continue for the period of at least twelve months upon commissioning of the R&R equipment. The M&E design contained no provisions for the monitoring of the recovery/recycling operations of the created R&R centre and reporting of data to UNDP upon completion of the project. Due to its intrinsic limitations, the M&E plan could not ensure the tracking of all anticipated results.

813. The M&E design did not include the monitoring of halon prices that would determine the economic viability of the halon R&R centre.

8.2.1.6.6.2 M&E plan implementation

814. Consistent with the project implementation schedule, the start up of R&R operations was scheduled in 24 months after the approval of the GEF grant. According to the UNDP PIR, the project was certified as completed in 35 months after the date of approval of the project (January 2002). The international consultant supervised the implementation and certified the completion of conversion in January 2002. The Certificate of Completion could not be made available to the evaluator by the UNDP Montreal Protocol Unit. Similarly, UNDP was not able to provide monitoring and evaluations reports of its consultants. There was no specific training program that would ensure the continuation of M&E activities upon the completion of the project. Due to its basic limitations, the M&E plan could not ensure the tracking of anticipated results of the components of the project.

8.2.1.6.6.3 Budgeting and Funding for M&E activities

815. There was no specific budget line for M&E activities. The budget provided resources that could be used for monitoring, evaluation and supervisory activities through the following allocations: $9,920 for executing agency support costs; $25,000 for technology transfer/technical assistance; $1,240 for project support services and $10,000 for evaluation mission. All these resources were readily available.

8.2.1.6.6.4 Long-term Monitoring

816. The long term monitoring was not envisaged in the project. The responsibilities of executing agencies came to an end upon signing the certificate of completion. The project document did not establish take over procedures and responsibilities of the Government upon completion of the project.

8.2.1.6.7 Assessment of processes that affected attainment of project results

8.2.1.6.7.1 Preparation and readiness

817. The design of the UNDP project is based on the concept of the halon phase out action plan for low halon consuming Article 5 countries developed and approved by the MLF Executive Committee. The excerpts from the action plan have been attached to the halon project document. The major features of this action plan are as follows: carry out an assessment of existing uses of halons and identify the future need for halons to supply existing equipment and installations, a commitment to ban imports of halons and halon fire equipment, stop production of halon extinguishers if any in the country in order to freeze the supply at current levels, minimize halon emission and recover halons from non critical uses and identify a lead agency and resource person to work with the National Ozone Unit. The imports of halons were stopped in Azerbaijan in 1998. Several of the above elements have been incorporated into the project with slight adjustments.

818. The success of the implementation of such an action plan is related to the ability of the fire protection authorities to establish economically sustainable relationships with users of halons. The involvement of the NOU is also crucial to get the feedback and to seek additional assistance from the Government and the financing institution (MLF or GEF) if necessary.

819. The UNDP project in Azerbaijan had no provisions for conducting an economic and financial analysis that would facilitate the State Fire-fighting Agency to develop a business plan ensuring sustainable R&R operations. The lack of provisions for long-term monitoring was another deficiency in the project design.

820. The development of the comprehensive halon management plan requires the consideration of several additional elements: 1) Choose appropriate replacements or alternatives; 2) Establish database of halon users: 3) Establish National Halon Steering Committee: 4) Open discussions with the Military, Civil Aviation, Shipping, & Airlines; 5) Plan for decommissioning of halon systems. These elements have not been considered in the project document.

8.2.1.6.7.2 Country commitment

821. The Government facilitated the implementation of the halon management plan by adoption of the decree imposing ban on imports of halons to the country. The Government designated the State Fire-Fighting Agency as a focal point in the implementation of the project. The NOU was also involved in the coordination of the project providing reporting and feedback to the implementing agency. The project was certified as completed with the end of installation and commissioning of the R&R equipment that coincided with the closure of the IS project and dissolvent of the NOU. The NOU was re-established in a year time with much limited resources and was not able to continue the monitoring of halon R&R operations. The drafting and implementation of legislation after the project had been completed would be an indicator of government commitment to ozone layer protection. In Azerbaijan, the Government did not consider legislative measures requiring mandatory recovery and recycling of halons and actions to replace halons with alternatives.

822. The project contains no provisions requiring Government commitments in the continuation of monitoring of halon R&R operations after the closure of the project. The role of newly

established NOU is limited to sending official requests to ministries seeking information on ODS consumption as part of MP Article 7 reporting requirements. The complete absence of information in the NOU about the status of the halon R&R programme shows a low level of the Government ownership.

823. It appears that the programme on halon recovery in Azerbaijan lacked leadership and direction since the closure of the project. Although halon consumption has been reported as zero from 1 January 1998, there was no evidence of a Halon Management Plan (HMP), and there was no specific campaign directed at companies to recover halon which increased the prospects for unintentional halon emissions.

8.2.1.6.7.3 Stakeholder involvement

824. The project document identified the major stakeholders in the country to be involved in the implementation of the project: Government (State Fire Protection Department and MENR); Halon users (Railways, Offshore, Telecommunications, Defence, Civil Aviation, Ship transport); Fire equipment manufacturers; Fire equipment installers. The educational workshop was aiming at bringing all these stakeholders together. Unfortunately, information is not available about the role and involvement of each of these stakeholders in the implementation of the halon R&R programme.

825. On the evaluator's observations, there is a lack of communications between the Ozone Office and the Force Major Ministry (FMM) which is responsible for the fire fighting service, and the FMM and users of halons in the country.

8.2.1.6.7.4 Financial planning

826. The budget covered the creation of halon database, conducting the workshop, and procurement, installation, commissioning and start up of halon recovery and recycling operations. The planning and management of the project on part of UNDP and UNOPS ensured the proper flow of funds. As per UNDP PIR, the conversion was accomplished according to the established timetable with 11 months delay. The continuation of R&R operations by the State Fire Protection Department (SFPD) was based on self-financing using market mechanisms. As part of the financial planning, the project did not envisage conducting a feasibility study or providing a methodology for such a study to the SFPD to ensure sustainable halon R&R operations. The budget contained no provisions for the monitoring of the results of the project.

827. The evaluators had no access to financial documentation to verify the final actual project costs.

8.2.1.6.7.5 UNEP / UNDP Supervision and backstopping

828. The role of UNDP and UNOPS in supervising and backstopping of the project is described in the relevant Section above. UNDP/UNOPS was not able to provide the documentation demonstrating their supervising and backstopping role in the implementation of the project.

8.2.1.6.7.6 Co-financing and Project Outcomes & Sustainability

829. The project did not include co-financing of cash or in-kind on the part of the Government. The continuation of R&R operations by the State Fire Protection Department (SFPD) was based on self-financing using market mechanisms.

8.2.1.6.7.7 Delays and Project Outcomes & Sustainability

830. There was a delay in the implementation of 11 months. According to the UNDP PIR, the halon recycling equipment was commissioned and recycling operations started in January 2002. The delay of 11 months, presumably, resulted in halons emissions of unknown quantities within this period that could be avoided. The project ratings for the halon project are shown in Table 33.

Table 33: Project ratings for the halon project in Azerbaijan

Criterion	Evaluator's Summary Comments	Rating
Attainment of project objectives and results (overall rating)	The NOU and UNDP could not provide evidences of the achievement of project objectives. There are implicit indications that only one out of three objectives of the project was attained.	**U**
Effectiveness	There is no evidence of achievement of objectives stated in the halon project. The current status of the R&R equipment is not known. There is a major risk that about 65.3 ODP tonnes of halons containing in ship fire-fighting systems might be released into atmosphere.	**U**
Relevance	The project was a priority for the country ODS phase out programme. There is no evidence that project outcomes contributed to the attainment of established objectives and the wider portfolio of the GEF.	**MU**
Efficiency	ct was implemented with 11 months of delay against the approved schedule. There are no records available that could confirm any impact of the project in terms of recovered and reused halons. It is not possible to establish the actual cost-effectiveness of the project.	**U**
Sustainability of Project outcomes (overall rating)	There is no verifiable information on achievement of outcomes and their sustainability.	**U**
Financial	The Halon recycling operations were based on self-financing using market mechanisms in dealing with halon end-users. No data have been made available to confirm the success and sustainability of the outcomes of the project.	**U**
Socio Political	There is a lack of communication between the major stakeholders. Data on the current use of halons are controversial. No information is available on the present status of the halon recycling facility created as a result of the project. The presence of multinationals in the Azerbaijan petroleum industry was instrumental in bringing the non-ODS fire-fighting technology to the country.	**MU**
Institutional framework and governance	The Government and NOU provided the necessary support to UNDP and UNOPS during the implementation of the project. The role of Government and other stakeholders was inadequate in making the	**MU**

Criterion	Evaluator's Summary Comments	Rating
	outcomes of the project sustainable. There is no legislation imposing mandatory recovery and recycling of halons.	
Environmental	absence of the effective system of recovery/recycling, safe storage and eventual destruction of halons in Azerbaijan, there is a significant environmental risk of the release of halons identified in ship fire-fighting systems into the atmosphere.	**U**
Achievement of outputs and activities	According to the UNDP PIR, the outputs related to the execution of the recovery and recycling, database, and workshop components have been delivered with a delay of 11 months. However, there are no evidences of any effect or outcomes related to these activities.	**MU**
Monitoring and Evaluation (overall rating)	M&E system has major shortcomings in its design. Results of M&E activities are not available.	**U**
M&E Design	The M&E plan is represented by the project implementation schedule having time-bound indicators that does not meet GEF minimum requirements in terms of using SMART indicators. The M&E design contained no provisions for the monitoring of the recovery/recycling operations upon completion of the project. The M&E design did not include the monitoring of halon prices that would determine the economic viability of the halon R&R centre.	**U**
M&E Plan Implementation (use for adaptive management)	As designed, the M&E plan was reportedly implemented with assistance from the NOU and international consultants. UNDP was not able to provide monitoring and evaluations reports of its consultants.	**MU**
Budgeting and Funding for M&E activities	The budget had limited resources to support monitoring and evaluation activities by UNDP/UNOPS staff and international consultants. No allocations were provided for monitoring activities upon closure of the project.	**MU**
Catalytic Role	There is no information regarding any other initiatives on halon recovery and recycling activities in the country. The workshop component raised awareness about alternative technologies among the fire-fighting community and facilitated indirectly the introduction of new technologies especially in the petroleum industry	No ratings are requested for the catalytic role.

Criterion	Evaluator's Summary Comments	Rating
Preparation and readiness	The Government banned the imports of halons in 1999. The project had no provisions for conducting an economic and financial analysis that would facilitate SFFD Department to develop a business plan ensuring sustainable halon recycling operations. The lack of provisions for long-term monitoring was another deficiency in the project design.	**MU**
Country ownership / motivation	The Government facilitated the implementation of the halon project banning the imports of halons in 1999 and designating the SFFD as a focal point. The Government did not consider legislative measures to require mandatory recovery and recycling of halons.	**MU**
Stakeholders involvement	The project document identified the major stakeholders in the country to be involved in the implementation of the project. Information is not available about the role and involvement of stakeholders in the implementation of the project. There is a lack of communications between the Ozone Office and the Force Major Ministry.	**MU**
Financial planning	According to UNDP PIR, the planning and management of the project on part of UNDP and UNOPS ensured the proper flow of funds. As part of the financial planning, the project provided no assistance to the SFFD in devising the business plan to ensure sustainable halon recycling operations. The budget contained no provisions for the monitoring of the results of the project.	**MU**
UNEP Supervision and backstopping	UNDP and UNOPS conducted their supervisory and backstopping responsibilities. The international consultant supervised the implementation and certified the completion of conversion in January 2002. No monitoring and evaluations reports have been made available to the evaluators.	
Overall Rating	The project had major shortcomings in achievements of declared objectives.	**U**

Blank page for double-sided printing

3 Bulgaria

8.3.1 Background

831. Bulgaria was similar to other countries in Eastern Europe that experienced significant economic and social hardship when moving from a communist to a capitalist society[79]. Between 1992 and 1994 much of the land and industry were privatized, which was accompanied by high levels of unemployment for the remainder of the 1990s due to the failure of uncompetitive industries.

832. As in many of the countries that had become independent of the former Soviet Union that had ratified the Montreal Protocol, many steadily reduced imports of ODS from 1990 to 1995 in anticipation of the imminent closure of CFC and halon 2402 production in the Russian Federation. They aimed to eliminate their dependency on predominantly Russian imports by putting in place procedures that would minimise disruption to the national users of refrigeration and air conditioning equipment, when eventually the supply of ODS from Russia ceased.

833. In 1994 when the GEF ODS Phase Out Project was being formulated, Bulgaria had acceded to the Vienna Convention and the Montreal Protocol in 1990. Later Bulgaria ratified the London, Copenhagen and Montreal Amendments in 1999; and the Beijing Amendment in 2002.

834. As a developed country that had agreed to the Montreal Protocol and its Amendments, Bulgaria was required to, *inter alia*, to phase out the Consumption of halon on 1 January 1994; and to phase out CFCs, methyl chloroform and carbon tetrachloride on 1 January 1996. Consumption of CFCs by Bulgaria was reduced from 2,612 ODP-tonnes in 1989 to 322 ODP-tonnes in 1995[80], during a period of severe economic turmoil. Despite this significant effort, Bulgaria found itself in non-compliance with the Protocol because of the reported Consumption of 5.6 ODP-tonnes[2] of Annex A (Group I and II) substances in 1996; and 1.6 ODP-tonnes of halon that were reported as Consumption in 1996 and 1997.

835. Bulgaria met twice with the Protocol's Implementation Committee to discuss its compliance status with the requirements of the Montreal Protocol. In 1995, Bulgaria notified the Committee that there was a likelihood of non-compliance in 1996. At the second meeting in 1999, the Committee noted Bulgaria's Consumption of 1.6 ODP-tonnes of CFCs in 1997, and expressed its appreciation for the work undertaken by Bulgaria that had been undertaken with the financial assistance of the GEF, and that had resulted in the development of a country programme and a phase out plan that had brought Bulgaria into compliance[81].

836. The phase out of a range of ozone-depleting substances in Bulgaria and other countries has been reported recently[82]. The phase out of methyl bromide occurred later than the CFCs as a result of efforts carried out in two regional projects to replace methyl bromide with alternatives. The evaluation in this report concerns the phase out of methyl bromide in Bulgaria, according to the work undertaken in the UNDP/UNEP project entitled "*Total Sector Methyl Bromide Phase Out in Countries with Economies in Transition*".

8.3.2 Projects on methyl bromide

837. The GEF initially funded a UNEP Project entitled "*Initiating early phase out of methyl bromide in*

---

79 The first free elections since 1931 were held in June 1990. In July 1991 a new Constitution was adopted.

80 OzSec Data Centre, data update 13 May 2009. Annex A (Group 1 CFCs)= 4 ODP-t; Annex B (Group II halons)= 1.6 ODP-t

81 Dec VII/16 (1995) and Dec XI/24 (1999): Compliance with the Montreal Protocol by Bulgaria

82 Batchelor, T.A., Smirnov, V. and LA Risby. 2009. Impact Evaluation of the Phase Out of Ozone-Depleting Substances in Countries with Economies in Transition. *Volume 1: Theory of Change*. 181 pp. *Volume 2: Country Reports*. 271 pp. Report to the Global Environment Facility Evaluation Office. 7 August 2009.

CEITs through awareness raising, policy development and demonstration/training activities". This was a Medium-Sized Project (MSP) that was designed to assist seven CEITs to reduce their use of methyl bromide[83]. The Project commenced in March 2000 and concluded in September 2002. The total budget was $806,195 consisting of $700,000 from GEF, $37,000 in kind from the government, and $106,195 from Canada. This project is not subject to evaluation in this report, but was a forerunner to a later UNDP/UNEP Regional Project which is the subject of this evaluation.

838. The Project "*Initiating early phase out of methyl bromide in CEITs through awareness raising, policy development and demonstration/training activities*" consisted mainly of awareness raising activities on the uses of methyl bromide and its alternatives, policy development for methyl bromide phase out, identification of alternatives, diffusion of demonstration results, adoption of alternatives, and implementation of national programmes. Workshops were held in Hungary (23-25 April 2001, soil uses) and Bulgaria (28-30 May 2002, postharvest uses). The project assisted Bulgaria to complete a range of activities toward the reduction and phase out of methyl bromide, including the publication by the NOU in both English and Bulgarian of a booklet entitled "*Without MB –but how?*", which was based on material translated from UNEP publications; publication of methyl bromide Consumption figures and presentations from the national awareness meeting held in Plovdiv (2001); and a video on the topic of methyl bromide and radio commentary were broadcast. The Extension Service provided seminars on alternatives to methyl bromide in grapes and vegetable production. Bulgaria surveyed the rural population to determine their awareness of the need to phase out methyl bromide. The project encouraged Bulgaria to expand the use of solarisation to control soil pests, which it had initiated in 1999.

839. As a result of the achievements in the project entitled "*Initiating early phase out of methyl bromide in CEITs through awareness raising, policy development and demonstration/training activities*", Bulgaria implemented legislation[84] in 2002 that banned methyl bromide from the market after 31 December 2003 and its use after 31 December 2004, except for quarantine and pre-shipment and critical uses. Methyl bromide applicators were required to be licensed and to minimize any emissions of methyl bromide. A 50 meter buffer zone was required between fumigated fields and any housing.

840. The workshops held in Hungary and Bulgaria concluded, in part, that further investment was needed to implement methyl bromide alternatives for to control pests in soil and durable commodities, and possibly for structural fumigation. The workshops also identified a need for non-investment activity such as training in the implementation of policies and measures to limit the use of methyl bromide and to expand the use of alternatives, to support and sustain training on the use, and the development of, alternative techniques.

841. This project laid the foundation for further work in the UNDP/UNEP "*Total Sector Methyl Bromide Phase Out in Countries with Economies in Transition*" that completed the phase out of the Non-QPS uses of methyl bromide. The results of this Project are evaluated in this Evaluation Report.

8.3.3 GF/4040-05-05 "Total Sector Methyl Bromide Phase Out in Countries with Economies in Transition"

8.3.3.1 Introduction

842. The GEF also funded the UNDP/UNEP "*Total Sector Methyl Bromide Phase Out in Countries with Economies in Transition*". The UNEP budget for the non-investment activities in the regional project was $4,203,754 including $130,500 for project development, $2,151,325 from the GEF and $1,921,929 of in-kind co-finance[85]. The UNDP budget for the investment activities in the regional project was $3,267,075 including $45,000 for project development, $2,848,675 from the GEF and expected in-kind contributions of $373,400[86]. The total budget for the project was therefore $7,470,829. The regional methyl bromide phase out project was scheduled to

---

[83] GF/4040-00-10 for CEITs Bulgaria, Estonia, Hungary, Latvia, Lithuania, Poland and Slovakia
[84] Regulation 224. 2002.
[85] UNEP. 2008. UNEP GEF PIR FY 2008 Review 1. For the period 1 July 2007 to 30 June 2008. 50 pp
[86] UNDP. 2003. Total Sector Methyl Bromide Phase Out in Countries with Economies in Transition. GEF – UNDP Project Document. 29 pp.

commence in May (UNEP) or December (UNDP) 2004 and to conclude in May 2006 (UNEP) or November 2007 (UNDP).

843. The project was completed in Bulgaria on 30 June 2008, after one extension beyond the original closing date of 31 December 2007. Bulgaria was budgeted GEF funds of $727,522 which consisted of $177,526 for non-investment and $549,996 for investment activities. The government of Bulgaria was reported to have co-financed some of the activities related to Project coordination, but the amount co-financed was not declared.

844. The objectives of the project were to phase out the non-QPS uses of methyl bromide by 1 January 2005, in accordance with the Copenhagen Amendment to the Montreal Protocol. In addition, Bulgaria acceded to the EU on 1 January 2007. As a new EU Member States, Bulgaria was required to have harmonised its legislation and practices on ODS with those of the EU, preferably well in advance of accession which was a key driver for Bulgaria. In 2003, Bulgaria reported 2.3 ODP-tonnes of methyl bromide, which was much less than the amount of 51.8 ODP-tonnes reported in 1991, but even this had to be reduced to zero by 31 December 2004 in order to comply with Montreal Protocol and EU requirements.

8.3.3.2 Attainment of objectives and planned results

8.3.3.2.1 Effectiveness

845. The project phased out methyl bromide through a combination of awareness raising activities, policy development assistance, training on alternatives and investment activities, and data collection activities to measure the impact of the project. According to UNEP[87], this included the following performance indicators:

- Provision of methyl bromide publications and materials (with provisions for translation into local languages) to support *awareness-raising* activities;
- Training workshops or modules on *policy development* for the control of methyl bromide (bringing together policy makers, Customs officers, importers, users, producers)
- *Training courses/workshops* to educate stakeholders on alternatives and to develop training strategies for local extension workers on promoting and implementing alternatives;
- *Investment activity* to implement suitable methyl bromide alternatives for control of pests in soil (pre-harvest) and durable commodities (post-harvest); and
- The phase out of non-QPS methyl bromide consumption[88].

846. The achievement of outputs and activities by Bulgaria, as measured against these performance indicators, are provided in Section 8.3.3.5.1 "*Delivered outputs*" on page 218.

8.3.3.2.2 Relevance

8.3.3.2.2.1 Continued reduction of methyl bromide

847. The countries involved in the project "*Initiating early phase out of methyl bromide in CEITs through awareness raising, policy development and demonstration/training activities*", reduced their combined consumption of methyl bromide from 120.42 ODP-tonnes at the start of the project to 86.16 ODP-tonnes in 2000. However, consumption reported in 2001 indicated that for some countries investment assistance was urgently needed to fully phase out methyl bromide. Bulgaria, the Czech Republic, Estonia, Hungary, Latvia, Lithuania, Poland, and Slovakia were the original participants in the project, with Bulgaria, Hungary, Latvia, Lithuania and Poland being responsible for the main consumption in the region. In 2001, three countries (Bulgaria, Latvia and Poland) showed signs of a return to increased consumption.

848. The project was relevant because the governments of these countries maintained that without further assistance they would be unable to completely phase out methyl bromide.

---

[87] UNEP. 2003. GEF PDF Block B Request: *Total Sector MB Phase Out in Countries with Economies in Transition*. Page 9. UNEP-DTIE internal publication. 41 pages.

[88] Included by the evaluators in this report as this was implied but not stated by UNEP.

8.3.3.2.2.2 *Avoidance of methyl bromide critical use requests*

849. Regulation (EC) No 2037/2000 on *Substances that Deplete the Ozone Layer* has more stringent criteria for determining 'critical use' exemptions than those contained in the Montreal Protocol[89]. In 2005, the EU licensed only modest critical use exemptions that were much less than those approved by the Montreal Protocol, in accordance with the criteria contained in Decision IX/6 of the Montreal Protocol.

850. The project was relevant as it assisted the participating countries to deploy alternatives to avoid applications for 'critical uses'. The short time frame in the project required the transfer of proven methyl bromide alternatives from other regions with similar climates and conditions, and to adapt them to local conditions.

8.3.3.2.2.3 *Compliance with market standards*

851. Farmers in Europe are experiencing market pressures to reduce the environmental impact of their farming practices. For example, European supermarket chains have established a code of practice for agricultural production for fruit and vegetables, called EurepGAP. EurepGAP is a private sector body that sets voluntary standards for the certification of agricultural products globally. These standards were developed in response to consumer concerns about food production standards, pesticides and environmental pollution from agriculture.

852. Increasingly, the European supermarket chains are requiring farmers/suppliers to comply with these strict standards if they wish to continue supplying the supermarkets in future. The standards require suppliers/farmers to justify in writing the use of methyl bromide and other fumigants, and strongly promote integrated pest management (IPM) and non-chemical methods of controlling pests and diseases.

853. The project was relevant because it helped to build capacity for the longer-term development of non-chemical alternatives that are suitable for the markets and circumstances in which they operate.

8.3.3.2.2.4 *Recommendations for reducing methyl bromide use*

854. The GEF[90] stated that "*…In order to achieve compliance with the Montreal Protocol, a full phase out of all reported (non-QPS) consumption (and production) needs to be achieved by the end of 2004 … consumption needs to be reduced from the current levels … to zero in 2005*". Because methyl bromide was still being consumed in Bulgaria, it was eligible for assistance to completely phase out methyl bromide.

855. The Workshop on Methyl Bromide Alternatives for Soil Uses (April 2001, Hungary) concluded in part that the deployment of alternatives *"…may need extra financial investment, (with the further) support of the GEF, particularly where the establishment of soil-less production, registration of new biological agents or pesticides, or higher application costs of physical and cultivation costs are involved".*

856. A similar conclusion was reached by working groups at the subsequent meeting in Bulgaria for training in post-harvest alternatives (May, 2002), where participants concluded in part that *"…Alternatives are present, but assistance is required for technology transfer and adaptation to the specific conditions, and to produce new alternatives as the existing ones are not always suitable to replace MB (under the conditions experienced in the CEITs of the Eastern European region)…".*

8.3.3.2.2.5 *Compliance with the Montreal Protocol*

857. The reduction and phase out of methyl bromide in Bulgaria is also consistent with the objectives of the Vienna Convention and the Montreal Protocol, which *requires Parties to take appropriate measures in accordance with the provisions of this Convention and of those Protocols in force to which they are party to protect human health and the environment against adverse effects resulting or likely to result from human activities which modify or are likely to modify the ozone*

---

[89] Regulation (EC) No 2037/2000. Article 3 (2)(iii).

[90] GEF. 2003. GEF Support to Countries with Economies in Transition in Phasing Out of Annex C1 and E Substances of the Montreal Protocol GEF/C.18/Inf.6, page A4

layer[91].

858. The GEF established in 1995 an Ozone Layer Depletion Focal Area in response to the Montreal Protocol. The Focal Area has the strategic objective of protecting human health and the environment by assisting countries to phase out their consumption and production of ODS, to prevent emissions of ODS, and to encourage the uptake of alternative technologies and practices according to a country's commitments under the Montreal Protocol. The financial interventions in the GEF Focal Area contribute to the return of the ozone layer to pre-1980 ozone levels, which is expected by 2065.

859. The reduction and phase out of methyl bromide was a requirement for developed countries such as Bulgaria that had ratified the Copenhagen Amendment in the Montreal Protocol. In addition, the reduction and phase out of methyl bromide was required prior to Bulgaria's accession to the EU on 1 January 2007 was relevant for avoiding non-compliance with EU legislation on methyl bromide that applied shortly after accession.

860. The actions taken by Bulgaria to phase out methyl bromide were therefore relevant to continuing the reductions in methyl bromide use that had been achieved in previous projects, compliance with market standards by implementing production practices that minimised the use of chemicals in the food chain, recommendations for reducing methyl bromide use, compliance with Montreal Protocol, and compliance with EU regulations in preparation for accession to the EU.

8.3.3.2.3 Efficiency

861. The cost-effectiveness as a means of determining '*efficiency*' was not relevant to the Institutional Strengthening component of this project (such as advice on the development of policies and measures), as Institutional Strengthening is not normally subject to cost-effectiveness criteria. The GEF/UNEP-UNDP non-investment in the regional project was $4,203,754.

862. The government of Bulgaria reported that a total of $549,996 had been paid for pre- and post-harvest equipment. In 2003 which was the year before the project was implemented, Bulgaria reported a methyl bromide consumption of 4.2 ODP-tonnes[92]. The cost-effectiveness of the project for the phase out of the methyl bromide for pre-harvest and post-harvest uses was therefore $131 per ODP-kg. The methyl bromide baseline for Bulgaria in the Project Document was reported as 16.3 ODP-tonnes[93], which improved the cost-effectiveness to $33.74 per ODP-kg. This baseline was used at the time of project formulation as Bulgaria had reported a methyl bromide consumption of 16.2 ODP-tonnes in both 2001 and 2002.

863. UNDP estimated the cost-effectiveness to the GEF to be about $50 per ODP-kg for the investment component of the regional project, based on the phase out of about 100.2 ODP-tonnes of methyl bromide annually in the region of the participating countries[94].

864. The cost-effectiveness reported by the MLF for the phase out of methyl bromide in 31 developing countries prior to 2003 ranged from $0.04 to $85.18 per ODP-kg, the price depending mainly on the size of the project and its location[95]. The average cost-effectiveness in 24 completed projects that were assessed by the MLF was $23.55 per ODP-kg of methyl bromide.

865. The cost-effectiveness of $131 per ODP-kg based on the reported phase out of methyl bromide in Bulgaria was more than five times as expensive as the average cost-effectiveness of $23.54 ODP-kg per year of MLF-financed methyl bromide phase out projects described above. The cost-effectiveness of $131 per ODP-kg based on the reported phase out of methyl bromide in Bulgaria was also about 1.5 times more expensive than the most expensive MLF-funded methyl bromide phase out project in a developed country (Senegal) which had a cost-effectiveness of $85.18 per ODP-kg.

866. The evaluation team considered the smaller target of 4.2 OPD-tonnes to be appropriate as this was the methyl bromide consumption officially reported by the NOU to the Ozone Secretariat,

---

91 Handbook for the Vienna Convention for the Protection of the Ozone Layer - 7th Edition (2006). Article 2: General Obligations.

92 Ozone Secretariat Data Centre, 8 June 2009

93 UNEP. 2008. UNEP GEF PIR FY 2008. Assessment of the status of the project by UNEP. Internal document.

94 UNDP. 2003. Total Sector Methyl Bromide Phase Out in Countries with Economies in Transition. GEF – UNDP Project Document. 29 pp. Page 27.

95 MLF. 2004. Desk Study on Methyl Bromide Projects. UNEP/OzL.Pro/ExCom/43/8. Annex V, pages 36-37.

whereas the larger figure of 16.3 ODP-tonnes was an estimate made at the start of the project. The cost-effectiveness of the phase out project in Bulgaria was therefore assessed as expensive, compared with similar projects undertaken in developing countries.

8.3.3.3 Assessment of sustainability of project outcomes

8.3.3.3.1 Financial resources

867. The Country Programme, which included key policy actions and identified priority investments, received wide support from Government departments such as MoEW and Customs, as well as enterprises and an NGO. The ODS phase out was a core government objective in Bulgaria's environmental strategy.

868. The Government formed an Ozone Task Force within the Ministry of Environment and Water (MoEW) to implement, manage and monitor the GEF Project. The OTF became more effective after it was re-structured in June 1997, resulting in 77% of the funds being disbursed between 1 July 1998 and 30 June 1999. The Global Atmospheric Department in the MoEW currently has three staff involved in the control of ODS and fluorinated gases, two of which were involved in the Regional Project on the phase out of methyl bromide.

869. The GEF funding for the institutional strengthening component of the Project was reported by the NOU to have been crucially important for resourcing activities that contributed toward the development of the legislation and for putting in place procedures to permit, track and record ODS including methyl bromide. The funding assisted Bulgaria to train experts from MoEW on how to manage donor projects. The funding for these activities was especially important at the time when Bulgaria was in economic crisis, as many banks went bankrupt and inflation was rampant.

870. After 1 January 2007 when Bulgaria acceded to the EU, as a new Member State Bulgaria had access to funds to progress Bulgaria's political and economic transition in areas that included transport, local development, energy, environment and finance. In addition, Bulgaria had access to the EU's Cohesion Fund which is a structural instrument that helps Member States to reduce economic and social disparities and to stabilise their economies. The Cohesion Fund made available to all Member States €15.9 billion (in 2004 prices) in 2004-2006, but more than half of the funding (EUR 8.49 billion) was reserved for activities in Member States that most recently joined the EU such as Bulgaria.

871. Legislation implemented in Bulgaria targeted many different aspects of controlling ODS including methyl bromide. It focused in particular on licensing companies that used ODS, banned some ODS imports, and instituted importer-pay fees for ODS that were still permitted such as methyl bromide. The importer-pay requirement was particularly important for discouraging imports and also helping to finance government activities related to ODS monitoring and control.

872. There were several key organisations involved in the implementation of alternatives that were independently financed by the government. They included the Maritsa Vegetable Crops Research Institute, the Agricultural University of Plovdiv, the Institute for Plant Protection at Kostinbrod, the National Plant Protection Service and its Regional Plant Protection Services. There are also several companies involved in the commercial implementation of soil and postharvest activities.

873. The combination of funding from government, private (companies / technicians) and EU was assessed in this evaluation as likely to be sufficient to sustain activities in Bulgaria on alternatives to methyl bromide. The sustainability of the programme is also discussed in paragraph 876 "Environmental" in regard to the monitoring and reporting requirements that are required under EU environmental legislation.

8.3.3.3.2 Socio-political

874. The methyl bromide phase out project was coordinated by a senior representative from the MoEW. The MoEW coordinated the activities of a range of organisations that were involved in the programme, including the Maritsa Vegetable Crops Research Institute, the Agricultural University of Plovdiv, the Institute for plant protection of Kostinbrod, and the National Plant Protection Service and its Regional Plant Protection Services. There were also several companies involved in the implementation of alternatives for the control of soil and durable commodity

pests.

875. The major challenges that the MoEW faced at the beginning of the Project was to achieve sufficient administrative capacity to be able to direct the Project competently, to cope with unknown and sometimes changing procedures and methods of work involving the implementing agencies, and to overcome the scepticism towards methyl bromide alternatives expressed by both the fumigators and the farmers that depended on their services. At the end of the Project, the major challenge for the MoEW was to find a fair way to distribute the equipment.

8.3.3.3.3 Institutional framework and governance

876. The ODS phase out was a core government objective in Bulgaria's environment strategy. The Country Programme, which included key policy actions and identified priority investments, received wide support from Government departments such as MoEW and Customs, as well as enterprises and an NGO.

877. The Government formed an Ozone Task Force within MoEW to implement, manage and monitor the GEF Project. In 2009, the Global Atmospheric Department in the MoEW had three staff involved in the control of ODS and fluorinated gases, two of which were involved in the Regional Project on the phase out of methyl bromide.

878. From 1992 and 1994, the National Assembly defined a national programme for ending the use of ODS in Bulgaria, which was later transposed in legislation:

- Established a licensing system on the import of ODS and ODS-containing equipment, including those used in pharmaceutical products (1994);
- Banned imports of CFCs (1996);
- Implemented penalties for deliberate venting of CFCs (1996);
- Introduced fees for importing HCFCs and methyl bromide (1996);
- Set import quotas for HCFCs, and required imported quantities to be reported (1996);
- Set deadlines for ending the trade and use of HCFCs (1996);
- Required recovery and recycling of CFC-12 for servicing (1996).
- Improved the ODS import/export licensing system (1999).

879. The programme coordinator within MoEW organised regular meetings of the National Steering Committee with the stakeholders to obtain feedback on progress in the various activities. The MoEW coordinated the activities between the Implementing Agencies, the companies and the organisations and institutes that were involved in the implementation of the alternatives. The feedback on the project continued for two years after its completion, in compliance with the requirement for the beneficiaries of the equipment to send a report every 6 months to the Regional Service for Plant Protection in Plovdiv.

880. When some activities were delayed, MoEW identified the cause of the delay and suggested solutions. When UNDP was involved on some occasions the intervention was successful, but on other occasions the MoEW regretted that it was not always able to solve a fundamental communication problem that seemed to be between the Bratislava and Sofia offices of UNDP.

881. This legislation was well-timed and affected a wide range of ODS including methyl bromide. It targeted many different aspects of controlling ODS, but in particular licensing, bans on imports, and importer-pay fees. The legislation on penalties for deliberate venting of CFCs was the forerunner to later legislation that mandated recovery and recycling of ODS. Some of this legislation was implemented *before* the start of the GEF Project, which gave sub-project implementation a 'flying start'. Legislation continued to be put in place as recently as 2009, which indicated the government's commitment to environmental protection including the climate system and the ozone layer.

882. The range of organisations involved in Bulgaria was assessed as sufficient to promote the sustainability of the methyl bromide phase out because these government and commercial organisations were staffed by personnel that had built up experience in activities related to the reduction and phase out of methyl bromide, including training in best-practice management of alternatives to methyl bromide and optimisation of the conditions and procedures to use the alternatives cost-effectively.

8.3.3.3.4 Environmental

883. The main driver affecting the use of methyl bromide in Bulgaria was national and EU legislation that existed at the time of the project that restricted the use of methyl bromide and that required activities by users and Member State competent authorities. The EU legislation has since been superseded by revised legislation that has eliminated the use of methyl bromide altogether.

884. The environmental legislation that was in force in the EU at the time of the project and until 31 December 2009 was Regulation (EC) 2037/2000. This legislation required Member States:

- To phase out the placing on the market of non-QPS uses of methyl bromide by 31 December 2004;
- To put in place all precautionary measures practicable to prevent and minimise leakages of methyl bromide from fumigation installations and operations in which methyl bromide is used;
- Whenever methyl bromide was used in soil fumigation, to use of virtually impermeable films for a sufficient time, or other techniques ensuring at least the same level of environmental protection, was mandatory; and
- To define the minimum qualification requirements for the personnel involved in methyl bromide fumigation; and
- To require producers, importers and exporters of methyl bromide to report to the European Commission on the quantities of ODS produced, imported and exported annually.

885. In 2002, Bulgaria implemented legislation[96] that banned methyl bromide from the market after 31 December 2003 and its use after 31 December 2004, except for quarantine and pre-shipment and critical uses. Methyl bromide applicators were required to be licensed and to minimize any emissions of methyl bromide. A 50 meter buffer zone was required between fumigated fields and any housing.

886. Bulgaria developed and implemented an effective national strategy and programme which enabled it to achieve the Montreal Protocol's scheduled phaseout deadline of 31 December 2004. Bulgaria did not submit any requests for Critical Use Exemptions to the Montreal Protocol from 1 January 2005 onwards[97]. The EC did not use Critical Uses of methyl bromide from 1 January 2009

887. New legislation on ODS came into force on 1 January 2010. Regulation (EC) No 1005/2009 replaced Regulation (EC) 2037/2000. Methyl bromide did not meet the safety criteria and was de-registered in the Biocides Directive[98] (non-plant pesticide) from 1 September 2006, and in the Pesticides Directive[99] (Plant Protection Product, PPPD) from 18 March 2009.

888. Regulation (EC) No 1005/2009 allows MB-QPS stocks[100] to be used until 18 March 2010, but limits the quantity to 45 ODP-tonnes from 1 January to 18 March 2010, and none from this date onwards. Up until 18 March, methyl bromide can only be used for QPS at government-approved fumigation sites and only if degassing equipment is in place to recover 80% of the methyl bromide used in the fumigation. Methyl bromide may be used for Emergency Uses[101] for controlling unexpected pest outbreaks, but only if it is first authorised by the European Commission and providing methyl bromide is permitted under the Biocides and Pesticides Directives. Currently, methyl bromide is not permitted in these Directives and *ipso facto* it cannot be used for QPS. Therefore, all uses of methyl bromide including those for QPS are banned in the EU from 19 March 2010.

---

96 Regulation 224. 2002.

97 TEAP. 2009. Critical Use Nominations for Methyl Bromide. Annex IV. Part A: Trend in Pre-Plant Soil Applications. Part B: Trends in Post-harvest Structural and Commodity Applications. Period 2005 to 2010. Information supplied by the Ozone Secretariat to MBTOC. Pages 79-83.

98 Regulation (EC) 2032/2003

99 Decision 2008/753/EC

100 Articles 12 (1) (2) in Regulation (EC) No 1005/2009 on ODS

101 Articles 12 (3) in Regulation (EC) No 1005/2009 on ODS

889. The main environmental risk that could undermine the implementation of the alternatives in Bulgaria is illegal imports of methyl bromide. However, this seems unlikely since more than 120 Customs officers were trained in 2002 to detect ODS at the border. A further 5 Customs officers 18 environmental inspectors were trained in a one-day workshop held in 2007 using finance provided by the Customs Agency and the European Commission's Technical Assistance and Information Exchange Programme (TAIEX). Customs officers routinely check the import documents and, if these were not in order, they used the Refrigerant Identifiers to check the type of refrigerant. The customs department reported every March to the MoEW on the quantities of ODS imported and exported by type. To date there have been no interceptions of ODS that have resulted in legal action. Bulgaria has a policy of returning any illegal imports of equipment or refrigerant to the country of origin.

890. In addition to the inspection and monitoring procedures that have been implemented for ODS including methyl bromide, the previous and current regulation on ozone-depleting substances has in place a requirement for Member States to put in place *effective, proportionate and dissuasive* penalties for illegal import of ODS or illegal use of ODS.

891. Bulgaria was assessed as having put in place satisfactory measures to combat illegal trade in ODS. The Customs agency undertook both administrative and physical inspections of imported ODS, provided regular reports to MoEW on the results of their inspections, and the training of Customs officers has continued since the Project was completed in 2000.

892. The risk of methyl bromide import and use re-establishing in Bulgaria was assessed as low, because of the national and EU legislation, as well as Custom's ODS surveillance procedures and reporting that were in place.

8.3.3.4 Catalytic role

893. The key factors influencing catalytic action are *innovation, demonstration, replication* and *co-operation*. In this methyl bromide sub-project, the two factors that influenced catalytic action were *replication* and *co-operation*.

894. The Project Coordination Unit was responsible for encouraging a '*bottom to top*' training process. This increased the capacity of stakeholders to sustain the phase out and to take operational decisions that were both effective and economically viable. The planned activities and the use of cooperative methods of delivery laid the foundation for a supportive framework that implemented the alternative technologies.

895. As a result of the project, UNEP organised the participation of experts from the World Bank and the MLF to promote the *replication* of the training activities developed in this regional project. The training manuals were translated (into Russian), for broader use in the Eastern Europe and Central Asian region, at the cost of the MLF funds of the ECA network.

896. Bulgaria produced a Manual[102] for soil sector specialists (primarily future trainers and facilitators of Farm Field Schools) on practical ways to implement alternatives to methyl bromide. This was translated from Bulgarian into English by FAO so that it could be used to cooperate with soil specialists in other countries. Bulgarian experts produced the first chapter in the Manual entitled "*Major soil-borne phytopathogens on tomato and cucumber in Bulgaria, and methods for their management*". This chapter described the fungal damage to these crops and its replacement today with chemical and non-chemical (cultural, physical) methods. UNEP planned to use the training manual and other materials developed under this project as a useful resource in the OzonAction Clearinghouse programme, so that a wider audience could benefit from the experiences in the CEIT countries in the implementation of alternatives to methyl bromide.

897. The NOU co-operated with other departments, ministries and organisations (as described in Section 8.3.3.3.2) on a diverse range of activities on ozone layer protection. The World Bank officer responsible for the Ukraine methyl bromide project, as well as the Regional Ozone Network for Europe and Central Asia, were kept informed of the results of this project because of its potential to help with the phase out of methyl bromide in other countries.

898. For these reasons, this methyl bromide regional phase out project was assessed as having a

[102] FAO and UNEP. 2008. Manual: Alternatives to replace methyl bromide for soil-borne pest control in East and Central Europe. Edited by R. Labrada. FAO. 102 pp.

useful catalytic role.

8.3.3.5 Achievement of outputs and activities

8.3.3.5.1 Delivered outputs

899. Paragraph 845 above showed the basis for selecting the following achievement or performance indicators:

- Provision of methyl bromide publications and materials (with provisions for translation into local languages) to support *awareness-raising* activities;
- Training workshops or modules on *policy development* for the control of methyl bromide (bringing together policy makers, Customs officers, importers, users, producers)
- *Training courses/workshops* to educate stakeholders on alternatives and to develop training strategies for local extension workers on promoting and implementing alternatives;
- *Investment activity* to implement suitable methyl bromide alternatives for control of pests in soil (pre-harvest) and durable commodities (post-harvest); and
- The phase out of non-QPS methyl bromide consumption.

900. The delivered outputs are discussed for each of them below.

8.3.3.5.1.1 Awareness raising

901. The GEF/UNEP Project[103] "*Initiating early phase out of methyl bromide in CEITs through awareness raising, policy development and demonstration/training activities*" aimed to assist Bulgaria to comply with the phase out deadline for methyl bromide of 1 January 2005.

902. The project consisted mainly of awareness raising activities on the uses of methyl bromide and its alternatives, policy development for methyl bromide phase out, identification of alternatives, diffusion of demonstration results, adoption of alternatives, and implementation of national programmes. Workshops were held in Hungary (23-25 April 2001, soil uses) and Bulgaria (28-30 May 2002, postharvest uses).

903. Bulgaria reported that this Project was assisted in the completion of a range of activities, including the publication by the NOU in both English and Bulgarian of a booklet entitled "*Without MB – but how?*", which was based on material translated from UNEP publications; publication of methyl bromide Consumption figures and presentations from the national awareness meeting held in Plovdiv (2001); and a video on the topic of methyl bromide and radio commentary were broadcast. The Extension Service provided seminars on alternatives to methyl bromide in grapes and vegetable production. Bulgaria surveyed the rural population to determine their awareness of the need to phase out methyl bromide. In regard to alternatives, Bulgaria's involvement in the project encouraged the expansion of solarisation for the control of soil pests, which it had initiated in 1999.

904. This specific awareness raising work on methyl bromide was part of a broader awareness raising programme in Bulgaria on the need to phase out ozone-depleting substances generally. The broad programme was delivered by an NGO called "*Borrowed Nature*". This NGO carried out a 6-month public awareness programme on the importance of phasing-out ODS to protect the ozone layer. The programme helped to strengthen the project's sustainability by fostering a wider public awareness on the importance of ODS phaseout and the measures taken in Bulgaria for the phase-out. In large gatherings and in public events, the NGO provided information that highlighted the need to protect the earth's ozone layer. Short movies, including interviews with experts and Government officials, were shown on television. Press conferences and media workshops highlighted the need to protect the ozone layer. There was special emphasis on informing the young and a drawing competition was held for children. Seminars were held in 25 cities with representatives of industry, the media, Government institutions to explain national programmes, policies and future measures on the phase-out and management of ODS.

[103] GF/4040-00-10. Prof Reuben Ausher Review reported in October 2003.

905. After the completion of the Project, MoEW has been involved in Awareness Raising activities when funds were sufficient. The last big campaign in 2004 celebrated the International Ozone Day. Currently, the MoEW's activities related to making the legislative requirements more popular among stakeholders through workshops, publications in the national newspapers, and radio interviews. Key topics depended on the target audience: For schools, the MoEW stressed the importance of preserving the ozone layer and protecting themselves against harmful UV-B rays. For operators and servicing companies, the MoEW organised each year seminars for companies and operators to describe their obligations under the current ODS and F-gas legislation, and legislation under consideration for the future.

906. As in many other countries, Bulgaria undertook activities on Awareness Raising to shore up support from the public, government and business stakeholders for legislation and activities that would restrict and eventually phase out ODS. A baseline and performance indicators to measure the benefits of ODS reduction as a result of the awareness programme were never developed. These could have been, for example, before and after data on the number of ODS-free refrigerators bought by the general public, an increase in ODS refrigerators being sent for recycling, demand for information on the website (as number of hits) on ODS-free alternatives. It was therefore impossible to evaluate the impact of the awareness programme.

907. Despite not being able to measure the impact of the programme to raise awareness of ODS, the awareness raising activities were assessed as having been delivered.

8.3.3.5.1.2 Policy development

908. Bulgaria harmonised its national legislation several years in advance of adopting EC legislation on the phase out of ozone-depleting substances when it acceded to the EU on 1 January 2007.

Table 34: Legislation on ozone-depleting substances in Bulgaria

Year	Number	Description
1994	Decree No. 307	Regime on the export and import of ODS
1995	Decree No. 266	Amendment of the regime on the export and import of ODS
1996	Ordinance No. 3	Terms and conditions for permitting the Import and Export of ODS
		Clean Air Act (ODS addition)
1999	Decree No. 254	Control and Management of Ozone Depleting Substances
2002	Decree No. 224	Amendment to the Control and Management of ODS
2007	Decree No. 28	Amendment to the Control and Management of ODS
2008		Amendment to the Control and Management of Substances that Deplete the Ozone Layer
2009	Decree No. 336	Adoption of the Ordinance for establishing implementing measures of Regulation (EC) No. 842/2006 on certain F-gases
2009	*State Gaz No 6*	Clean Air Act (F-gases addition)

909. In 2002, Bulgaria implemented legislation[104] that banned methyl bromide from the market after 31 December 2003 and its use after 31 December 2004, except for quarantine and pre-shipment and critical uses. Methyl bromide applicators were required to be licensed and to minimize any emissions of methyl bromide. A 50 meter buffer zone was required between fumigated fields and any housing.

910. This legislation was well time and broad based. It targeted many different aspects of controlling ODS, but in particular licensing, bans on imports, and importer-pay fees. The legislation on penalties for deliberate venting of CFCs was the forerunner to later legislation that mandated recovery and recycling of ODS. Some of this legislation was implemented *before* the start of the GEF Project, which gave sub-project implementation a 'flying start'. Legislation continued to be put in place as recently as 2009, which indicated the government's commitment to

[104] Regulation 224. 2002.

environmental protection including the climate system and the ozone layer.

911. The development of the policies and the implementation of the legislation in Bulgaria, were assessed as having been delivered.

8.3.3.5.1.3 Training courses and workshops

8.3.3.5.1.3.1 Customs training

912. The First and Second phases of the customs training were undertaken just after the Project ended in 2000, which resulted in 120 customs officers being trained. The first phase of the training covered theory and practice, and the second phase focused on the practical aspects such as the use of the refrigerant identifiers. Later in February 2007, a further 15 Customs officers 18 environmental inspectors were trained in a one-day workshop with finance provided by the Customs Agency and the Technical Assistance and Information Exchange Programme (TAIEX).

8.3.3.5.1.3.2 Training on alternatives to methyl bromide

913. Training of farmers and postharvest specialists on the alternatives to methyl bromide was a major part of the Project. It began with the "*Train-the-Trainers*" programme, which focused on the chemical and non-chemical alternatives that could be used to control the most serious pests and diseases that affect vegetable production. A manual[105] on how to use alternatives to methyl was prepared and distributed to farmers. There were lectures and demonstrations, including a visit to glasshouses to see first-hand how to safely apply the pesticides and the use of solarisation sheets. There was farmer training on the use of the Dositron soil injection equipment that was used in the glasshouses and tunnel houses to release dazomet into the irrigation system. Staff from Yandi and Fitozashtita companies, who received rotary spaders from Imants in the Netherlands (one for granules, one for liquid), were trained by Imants specialists on the use of the soil fumigation equipment.

914. Most of the participants in the workshops and seminars on alternatives to methyl bromide reported that they were satisfied by the information provided in the field schools, workshops, conferences, publications, practical training and consultations. Moreover, they were confident in the application of the alternatives after the training. Solarisation combined with *Trichoderma* was reported to be used on the greatest area for soil disinfestation. Basamid and Nemasol were the most frequently applied chemical treatments, but to a smaller area than solarisation.

Figure 17: Rotary spaders for injecting nematocide in soil. Yandi company, Bulgaria.

915. In the postharvest sector, the Institute for Plant Protection in Kostinbrod and the University of Forestry of Sofia organized the training of 15 technologists, 20 end-users (owners of storages for grain and plant products) and 29 student technologists. The trainees were satisfied with the consultants chosen by UNDP/UNEP and the materials that provided information on alternatives.

916. The stakeholders were generally satisfied with the outcomes of the Project. However, they said they would have benefited from the advice of a committee that could have been established at the start of the Project to determine the most appropriate pest control equipment and technologies available. They envisaged that if a Committee had been established it could have undertaken a study tour to 2 or 3 countries to view equipment and procedures, and then to report back to the stakeholders. This might have avoided procurement of the rotary spader equipment, which was now considered too slow for the larger properties.

917. Despite the administrative difficulties experienced by MoEW, it successfully coordinated the

[105] *"The introduction of the most important pests on greenhouse vegetables and their control using methyl bromide alternatives"*

work of the organisations to deliver information on a range of suitable alternatives to the stakeholders. The combination of lectures and hands-on activities expedited the widespread use of alternatives by farmers and the subsequent reduction in the use of methyl bromide. The workshops and training in Bulgaria on alternatives to methyl bromide were assessed as having been delivered.

8.3.3.5.1.4 Investment activity

918. There were two companies that received GEF financial assistance in the *UNDP/UNEP Regional Project on the phase out of methyl bromide Project* to phase out methyl bromide used for disinfesting soil: Yandi and Fitozashtita.

919. In the pre-harvest sector, Swingfogs[106] were distributed to some greenhouses, the Agricultural University, the Crops Vegetable Institute "Maritsa" in Plovdiv and the Institute for Plant Protection in Kostinbrod. The Crops Vegetable Institute "Maritsa" also received a drip irrigation system. In the postharvest sector, there were 11 companies that received GEF financial assistance for equipment in the postharvest sector: Agria Plovdiv, Brothers Pilevi, Petromel, Socotab, Unipest Control, Nibo, Atanas Kostov & son, Teza 97, BulAgro Control, Yandi and Fitozashtita.

8.3.3.5.1.4.1 Yandi and Fitozashtita agricultural supply and service companies

920. Yandi and Fitozashtita companies both received two rotary spaders (Figure 17) for the application to the soil of metam-sodium or dazomet in glasshouses or plastic tunnels in different regions of Bulgaria. They reported that the work for the machines was generally increasing. They also provided general advice on pest and disease control to the farmers, and this had the potential to increase further.

921. In general, the farmers that owned larger glasshouses (more than 1 Ha) used a combination of solarisation and hydroponic production. They used solarisation with chemical disinfestation to reduce the time for soil disinfestation to about 2 weeks (depending on the temperature), as this was commercially acceptable. Without solarisation, the period extended to one month which was not satisfactory. The implementation of alternatives in Bulgaria on soil alternatives to methyl bromide were assessed as having been delivered.

Figure 18: Fogging machine that releases pesticide in flour mills. Yandi Company, Bulgaria

922. In the postharvest area, Agria Plovdiv, Brothers Pilevi, Petromel and Socotab received a range of postharvest equipment for heat treatment of mills, for pesticide fogging of mills and storage areas, for IPM insect trapping and monitoring operations, and for phosphine fumigation and monitoring.

Figure 19: Speedbox for rapidly releasing phosphine pesticide into flour mills. Yandi Company, Bulgaria

923. The equipment included heaters for heat treatments, vacuum cleaners and general cleaning equipment, sprayers, foggers (Figure 18), rodent traps and bait stations, insect monitoring traps and lures, phosphine generating equipment (Speedboxes™, Figure 19), phosphine insect-resistance testing kits, safety equipment such as masks, gas detectors and fumigant measuring equipment. The equipment was currently stored by 5 enterprises. Most of equipment had yet to be used commercially because the companies had not been transferred to

[106] SN PE (Greens, Philipov I.S. LTD, "GNC" LTD)

them by UNDP[107].

924. As of 2009, phosphine generated from the speedboxes has yet to be authorised by the Pesticide Department in Bulgaria. Bulgaria is intending to use the Mutual Recognition Procedure operating between Member States in the EU. However, the European Food Safety Authority Review recently identified data deficiencies, which will extend the period for approval.

925. The companies had mixed success. In general, the soil fumigation companies were looking at the prospects of more work as the area for soil disinfestation expanded. However, the impact of the project on the postharvest fumigation companies could not be assessed as these companies have not yet used most of the equipment that was delivered because it had not been transferred to them by UNDP. The implementation of alternatives in Bulgaria on postharvest alternatives to methyl bromide were assessed as unsatisfactory has the equipment has not be distributed to the end users.

8.3.3.5.1.5 The phase-out of methyl bromide consumption

926. The objectives of the *UNDP/UNEP* Regional Project were fully met. Bulgaria reported zero Consumption from 1 January 2004, which was a significant reduction from the reported Consumption of 51.8t in 1991. The phase out of methyl bromide in Bulgaria was assessed as satisfactory as the target of zero consumption by 31 December 2004 had been met.

927. Bulgaria reported that the information provided on methyl bromide alternatives by international consultants, and the equipment provide by the Project, were both of great importance for the sustainable phase out of methyl bromide. The companies involved in the soil and postharvest sectors would neither have been able to purchase the equipment with their own funds, nor would they have the capacity to gain the knowledge for the alternatives on their own.

8.3.3.5.2 Awareness about ODS, ODS substitute technology, and strengthening of institutional capacities to achieve the ODS phase-out

928. The extensive work in Bulgaria to increase the awareness of ozone layer depletion was described in Section 8.3.3.5.1.1 *Awareness raising* above. The work on methyl bromide substitute technology, which focused on several pre-harvest and post-harvest enterprises, was described in Section 8.3.3.5.1.4 *Investment activity* above.

929. The major challenges that the MoEW faced at the beginning of the Project was to achieve sufficient administrative capacity to be able to direct the Project competently, to cope with unknown and sometimes changing procedures and methods of work involving the implementing agencies, and to overcome the scepticism towards methyl bromide alternatives expressed by both the fumigators and the farmers that depended on their services.

930. The programme coordinator organised regular meetings of the National Steering Committee with the stakeholders to obtain feedback on progress in the various activities. The MoEW coordinated the activities between the Implementing Agencies, the companies and the organisations and institutes that were involved in the implementation of the alternatives. The feedback on the project continued for two years after its completion, in compliance with the requirement for the beneficiaries of the equipment to send a report every 6 months to the Regional Service for Plant Protection in Plovdiv.

931. The project strengthened the institutional capacity of the NOU to achieve the phase out of methyl bromide. Despite some administrative difficulties experienced by MoEW, it successfully coordinated the work of the organisations to deliver information on a range of suitable alternatives to the stakeholders. The combination of lectures and hands-on activities in Bulgaria expedited the widespread use of alternatives by farmers and the subsequent reduction in the use of methyl bromide.

8.3.3.5.3 Authority / credibility, necessary to influence policy and decision-makers

932. The NOU in Bulgaria had the authority / credibility, necessary to influence policy and decision-makers, which was shown mainly through the NOUs actions and ability to:

[107] The following equipment was used: 4 Thermonox heaters by Agria AD; 6 vacuum cleaners by Brothers Pilevi, Petromel and Socotab; 12 insecticide fogging machines. The insect traps, pheromone lures, safety materials and cleaning equipment were distributed to the companies

- Provide methyl bromide publications and materials to support *awareness-raising* activities;
- Implement *policies and measures* to control of methyl bromide, bringing together policy makers, Customs officers, importers, users, producers;
- Coordinate *training courses/workshops* to educate stakeholders on alternatives and to develop training strategies for local extension workers on promoting and implementing alternatives;
- Encourage *investment activity* to implement suitable methyl bromide alternatives for control of pests in soil (pre-harvest) and durable commodities (post-harvest); and
- The phase out of non-QPS methyl bromide consumption.

933. This credibility has been established by an NOU within the MoEW that cooperated with a diverse range of government bodies in Bulgaria that were involved in ODS (Section 8.3.3.3.2 Socio-political above described these bodies). The NOU was assessed as well-qualified to carry out tasks on methyl bromide reduction and phase out due to a combination of political, technical and administrative expertise.

8.3.3.6 Assessment of monitoring and evaluation systems

8.3.3.6.1 Monitoring and evaluation design

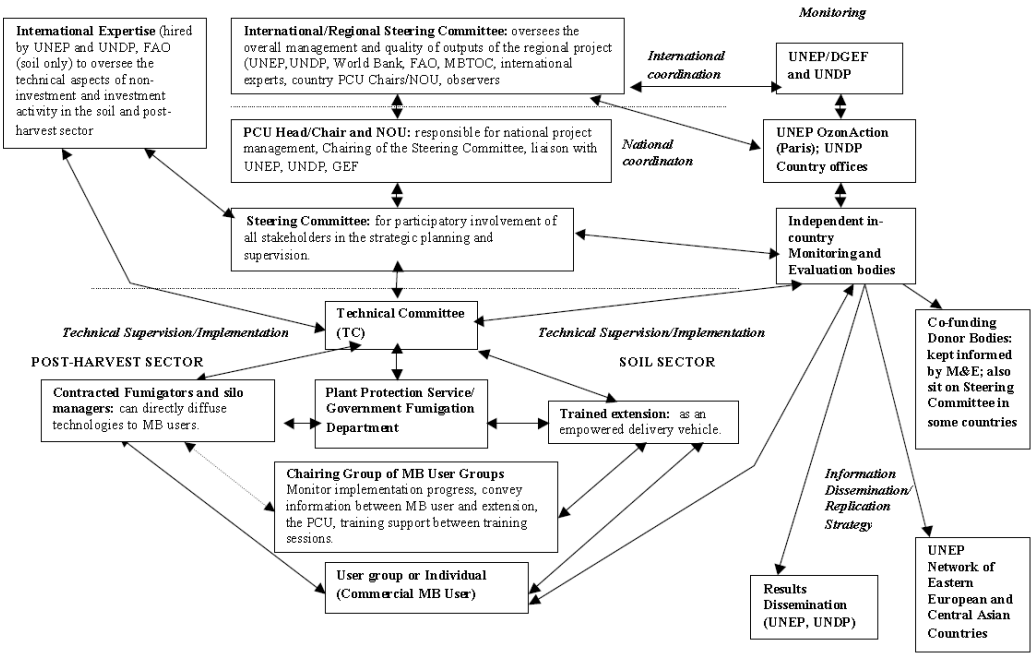
8.3.3.6.1.1 UNDP

934. UNDP took responsibility for the monitoring and evaluation of the investment component. At the end of each project year, the UNDP Montreal Protocol Unit aimed to evaluate the degree to which the objectives of the investment project had been achieved. Supervision missions were planned to be undertaken by relevant experts appointed by UNDP as necessary. The UNDP monitoring and evaluation activities were to be in addition to the normal monitoring and evaluation activity in the project undertaken as standard UNDP procedures.

In the participating countries, independent bodies were identified to also be responsible for M&E activities, as it was considered important to reduce the implementation period to meet the phase out deadlines. The M&E body was designed to act as a continuous management tool, visiting MB users, identifying success and failure factors, and providing information to the Project Coordination Unit and particularly feedback to the Steering Committee and Technical Committee, consultants and Implementing Agencies. The implementation, coordination and monitoring arrangements for the UNEP/UNDP/GEF Project[108] are shown in Figure 20.

[108] From: UNDP. 2003. Total Sector Methyl Bromide Phase Out in Countries with Economies in Transition. GEF – UNDP Project Document. 29 pp. Page 25.

Figure 20: Overall Implementation and Coordination Arrangements for the UNEP/UNDP/GEF Project



8.3.3.6.1.2 UNEP

935. UNEP designed an annual monitoring and evaluation format to assess the non-investment activities, and also provided a Final Assessment design which aimed to report on the results of the project.

8.3.3.6.1.2.1 Annual evaluation by UNEP

936. UNEP completed a '*Project Performance and Risk*' Table annually that measured and rated progress toward achieving the project objectives and assessed implementation progress. The progress was reported for each of the countries individually.

937. The attainment of the project objective, which was '*preservation of the ozone layer*', was measured against the outcome of a '*Sectoral phase out of methyl bromide in countries as required by the schedule of the Montreal Protocol*'. This outcome was defined as uses that were non-QPS and non-CUE, as both QPS and CUEs were permitted under certain conditions.

938. UNEP's M&E design[109], which aimed to annually measure implementation progress, referenced the requirement to monitor '*outputs*' (Table 35, column 2). UNEP also reported on progress with the implementation of the investment activity that was under the responsibility of UNDP.

Table 35: UNEP-designed "outputs" and "indicators" that were used to monitor progress and evaluate success in the methyl bromide phase out project implemented in Bulgaria

NO	OUTPUT	INDICATOR
Column 1	**Column 2**	**Column 3**
Document	*1) Project Performance and Risk* 2) *Final Evaluation*	*2) Final Evaluation*
1	Development and implementation of cost-effective, sustainable,	5. Permanent National Steering Committee, Technical Group,

[109] UNEP. 2008. GEF PIE FY 2008 (for the period 1 July 2007 to 30 June 2008).

NO	OUTPUT	INDICATOR
Column 1	**Column 2**	**Column 3**
Document	*1) Project Performance and Risk* 2) *Final Evaluation*	*2) Final Evaluation*
	national phase out coordination structures and mechanisms to carry out the project work, cope with future methyl bromide phase out problem areas, and sustain phase out post-project	and trained extension service and user groups in countries at project end; registration of additional pest control products where needed; implementation of additional policy measures where needed.
2	Rapid transfer of replacement technologies to MB users, including installation of equipment and participatory training at local level, focusing on a quick replacement for the 2005 growing season to permit country compliance with the Montreal Protocol, [focus on non-chemical and IPM MB alternatives from 2006 onwards][110] [using fumigants/chemicals as necessary][111]	Replacement of MB use in sectors by chemical and non-chemical alternatives at the end of the project
3	Enhanced awareness and confidence of MB users and other stakeholders in the phase out process, through the monitoring of the efficacy and economic performance of alternatives, and increased ability of users to manage pest control problems and find solutions	Detailed regular reports by the Project Coordination Unit and the National M&E Unit on the progress of the MB replacement amongst MB users across sector and sub-sectors. Survey reports of the national M&E Unites, will include investigations into the mindset of the MB users towards the project and phase out exercise
4	Capacity building for the development of more environmentally friendly MB alternatives (primarily based on non-chemical methods), reducing dependency on fumigants/chemical	Reports by the Project Coordination Unit and the National M&E Unit on the progress of non-chemical and IPM MB alternatives amongst MB users across sector and sub sectors

[110] Text in UNEP "Annual Evaluation" but not "Final Evaluation"
[111] Text in UNEP "Final Evaluation" but not "Annual Evaluation"

NO	OUTPUT	INDICATOR
Column 1	**Column 2**	**Column 3**
Document	*1) Project Performance and Risk* 2) *Final Evaluation*	*2) Final Evaluation*
	alternatives to ensure sustainability in the long term	

939. UNEP also completed annually a '*Risk Factor*' Form, which was a combination of text and check boxes. The Project Manager and the Task Manager assigned ratings to the perceived risk as either '*low, medium, substantial, high, not applicable or to be determined*' for a range of project criteria: Project Management (Management structure, governance structure, internal communications, work flow, co-finance, budget, financial management, reporting, stakeholder involvement, external communications, short/long term balance, science and technological issues, political influences, other); and Project Context (political stability, environmental conditions, social/cultural/economic factors, capacity issues, other).

940. UNEP also completed a '*Rating Monitoring and Evaluation*' Form, including the M&E activities that were carried out during the reporting period. The mainly text answers in this section covered a broad range of issues, such as the quality of the initial baseline methyl bromide consumption, the usefulness of the indicators that were used to assess performance, any challenges faced by UNEP to obtain data that were required to assess the indicators, and lessons learnt in regard to M&E.

8.3.3.6.1.2.2 UNEP Final Evaluation

941. UNEP's M&E design[112], which aimed to measure the overall success of the project, referenced the requirement to monitor '*outputs*' (Table 35, column 2) and '*indicators'* (Table 35, column 3). The '*indicators'* were used by UNEP only for the Final Evaluation and they were not used in the Annual Evaluation. UNEP also reported on the overall success of the investment activity that was under the responsibility of UNDP.

8.3.3.6.1.3 Evaluation comments on the M&E designs

942. The following comments address the ability of the M&E design to track and monitor progress toward achieving the project's objectives:

- The annual implementation progress was not measured against the performance indicator, and it was difficult to see how progress was therefore determined;
- The output often contained more than one element (e.g., cost-effectiveness, coordination, structures/mechanisms, future problem areas), but the response by UNEP addressed some of them;
- Some elements were used in the as an output, but a performance indicator was not developed to measure the output e.g. cost-effectiveness[113];
- '*Problems in delivering outputs'* was a column on the Form that was rarely if ever completed by UNEP, which suggested that the projects had no difficulties achieving the outputs required;
- '*Expected completion date'* was a column on the Form that was rarely if ever completed by UNEP, which showed that SMART indicators were not used;
- The column format resulted in very long reports because for most of the form only about one-quarter of the page could be used, which made reading the form difficult;
- One Risk Factor table was completed for all five countries involved in the project,

[112] UNEP. 2008. Project Final Report – Bulgaria. 8 pp.

[113] The cost-effectiveness of alternatives to methyl bromide is very difficult to measure as it depends on the timing of the market, the methods used by the farmer, the level of pest infection at the time, and many other factors. At no stage was the financial value addressed, suggesting that cost-effectiveness was addressed superficially.

whereas in reality the risks were not uniform for all countries;

- The methyl bromide baseline for the project did not take account of the latest consumption data reported to the Ozone Secretariat at the time of the initiation of the project, which resulted in greater expenditure than needed to eliminate less methyl bromide than originally determined by the baseline;
- The evaluation of the M&E undertaken during the project was helpful as it assessed the status and quality of the M&E procedures; and
- The indicators used in the Final Evaluation should have been used to measure performance in the Annual Evaluation.

943. These limitations in the M&E design were assessed as reducing the ability of UNEP to assess the progress in the implementation of the project that aimed to introduce alternatives to methyl bromide in Bulgaria.

944. UNDP's Monitoring and Evaluation Plans were contained in Annex 5A: *Monitoring, Progress Reporting and Evaluation* and Annex 5B: *Terms of Reference for the Regional/International Project Steering Committee.* These Annexes were omitted from the UNDP Project Document and could not be evaluated.

8.3.3.6.2 UNEP monitoring and evaluation plan implementation

945. The M&E plans (annual and final) were implemented by UNEP, as evidenced by the reports provided to the evaluators. There were no reports that were made available to the evaluators from UNDP.

946. Although the design of the M&E plan had limitations, its value lay in the 'follow-up' by UNEP that clearly signalled to participants that their progress in this project was being monitored and evaluated. In addition, UNEP required reporting from participants on progress, which was then used to in these annual reports, and workshops were held to share information and keep the project on track.

947. UNDP planned to submit M&E reports to the national Project Coordination Unit, Regional/International Project Steering Committee, Implementing Agencies and other relevant organisations. UNDP anticipated a review of the project in mid-2005, one at the end of 2005, and one in early/mid 2006 when most of the project activities had been completed.

8.3.3.6.3 Budgeting and Funding for monitoring and evaluation activities

948. UNEP budgeted $10,000 for the "*…risk evaluation and development of the monitoring and evaluation strategy…*", and $5,000 for the "*… Evaluation Report (including survey results, needs (technical, financial, policy, training), awareness strategy, identification of co-funding partners, preliminary risk evaluation results…*". These direct costs associated with M&E activities may have also been supplemented by UNEP's activities in general, in their role as Project Coordinator/Consultant. UNDP also was assigned a budget of $45,000 for travel and national consultants, but funds for M&E were not separately identified.

949. The funding for M&E represents 6.7% ($15,000 of $225,000) of the total budget which, for an important activity, appeared to be relatively small. There was no information on budget versus expenditure and therefore it was not possible to assess the timing of the funding and compliance of expenditure with the budget assigned.

8.3.3.6.4 Long-term monitoring

950. There was no requirement for long term monitoring in this project. However, Bulgaria as a Member State of the EU has national reporting obligations under EU legislation on methyl bromide that it is imported or produced for feedstock and process agent uses[114]. Other uses of methyl bromide are no longer permitted under EU legislation after 18 March 2010, and therefore there are no other reporting requirements related to methyl bromide.

951. Article 7 "*Reporting of data*" in the Montreal Protocol requires Parties to report by 30 September each year on their consumption and production of ODS in the previous year.

[114] Article 27 of Regulation (EC) No 1005/2009 on Substances that Deplete the Ozone Layer that came into force on 1 January 2010

Bulgaria reported 2006 consumption data to the Montreal Protocol, but consumption data for 2007 onwards was reported by the European Commission on behalf of the EC including Bulgaria as a new Member State.

952. In addition, Decision XV/15 that was agreed in 2003 encouraged Parties to forward data on consumption and production to the Secretariat as soon as the figures became available, and preferably by 30 June each year, rather than 30 September in order to facilitate the work of the Protocol's Implementation Committee. The Implementation Committee has not remarked on any aspects of data reporting by Bulgaria, which suggested that reporting had been timely and accurate. The Secretariat reported in 2009 that most Parties complied with the voluntary June deadline.

953. Data reporting to the EC and to the Montreal Protocol on methyl bromide consumption is the most important action on long-term monitoring. Zero consumption reported by Bulgaria would indicate that methyl bromide has been phased out, and continual reporting of zero consumption annually would indicated that the phase out has been sustained.

954. Data reporting, and the infrastructure necessary for this, is expected to continue for ODS in general and for specific methyl bromide uses as described above. The costs for these data reports are expected to be included in the annual budget by the government of Bulgaria for work assigned to the NOU.

8.3.3.7 Assessment of processes that affected attainment of project results

8.3.3.7.1 Preparation and readiness

955. The main activity that indicates preparation and readiness for a project is the legislation that was in place prior to the start of the project to control methyl bromide, and the government and commercial infrastructure necessary to implement alternatives to methyl bromide that was in place prior to the start of the project.

956. Prior to the start of the project in May 2004, Bulgaria had in place four legislative Decrees, an Ordinance that controlled the use of ozone-depleting substances, and an update of the Clean Air Act to include ozone-depleting substance (Table 36). The legislation implemented in 2002 was particularly important as it banned methyl bromide from the market after 31 December 2003 and its use after 31 December 2004, except for quarantine and pre-shipment and critical uses. In addition, methyl bromide applicators were required to be licensed and to minimize any emissions of methyl bromide. A 50 meter buffer zone was required between fumigated fields and any housing. Many of these requirements were contained in EU legislation on ozone-depleting substances at the time, and therefore Bulgaria was being pro-active prior to joining the EC on 1 January 2007 when the national and EC legislation was required to be harmonised. However, the buffer zone was not part of EC legislation and was more strict.

Table 36: Legislation on ozone-depleting substances (including methyl bromide) in Bulgaria that was in force prior to the start of the project

Year	Number	Description
1994	Decree No. 307	Regime on the export and import of ODS
1995	Decree No. 266	Amendment of the regime on the export and import of ODS
1996	Ordinance No. 3	Terms and conditions for permitting the Import and Export of ODS
		Clean Air Act (ODS addition)
1999	Decree No. 254	Control and Management of Ozone Depleting Substances
2002	Decree No. 224	Amendment to the Control and Management of ODS, including controls on methyl bromide

957. The earlier project entitled "*Initiating early phase out of methyl bromide in CEITs through awareness raising, policy development and demonstration/training activities*" had helped to set up the infrastructure that was needed to implement the current project. That project had been instrumental in establishing teams in each country that consisted of specialists on alternatives to methyl bromide, workshops as a focus for information exchange, government ministries that

were involved in the phase out of methyl bromide, awareness raising activities, policy development and training. In addition, commercial companies had been involved in the demonstrations and visits. The government and commercial infrastructure had eliminated 90% of the methyl bromide, leaving the current project with a strong infrastructure to eliminate the remaining 10% (4.2 ODP-tonnes) of the methyl bromide as 48.6 ODP-tonnes had already been eliminated.

958. Bulgaria was assessed as well-prepared and ready for this project, as the legislation to control methyl bromide and the government and commercial infrastructure necessary to implement alternatives to methyl bromide, were in place well before the start of the project.

8.3.3.7.2 Country commitment and motivation

959. Bulgaria had put in place a range for activities to manage the phase out of methyl bromide. Among these, it had established an effective and sustainable administrative structure for monitoring the import and use of methyl bromide by companies. Since 2001 the MoEW had received reports from its inspectorate and from Customs on these imports, as well as information from fumigation companies.

960. Training of farmers and postharvest specialists on the alternatives to methyl bromide was a major part of the Project. It began with the "Train-the-Trainers" programme, which focused on the chemical and non-chemical alternatives that could be used to control the most serious pests and diseases that affect vegetable production. A manual[115] on how to use alternatives to methyl was prepared and distributed to farmers. There were lectures and demonstrations, including a visit to glasshouses to see first-hand how to safely apply the pesticides and the use of solarisation sheets. There was farmer training on the use of the Dositron soil injection equipment that was used in the glasshouses and tunnel houses to release dazomet into the irrigation system. Staff from Yandi and Fitozashtita companies, who received rotary spaders from Imants in the Netherlands (one for granules, one for liquid), were trained by Imants specialists on the use of the soil fumigation equipment.

961. From the end of the Project, the government has continued to show a significant commitment to financing staff to work on ODS phase out activities. Currently, Bulgaria finances from the central budget 1.5 FTE for ODS and F-gas issues. The financial support for ODS personnel by the government has varied from 1 – 2 FTEs, depending on the needs of individual Projects[116]. However, there is a risk that the small team could be left without sufficient staff for a period of 6-12 months in the event of a resignation, as government salaries were lower than in the private sector and recruitment procedures were reported by the NOU to be time-consuming.

8.3.3.7.3 Stakeholder involvement

962. The main stakeholders involved in the project were representatives from the MoEW; the Agriculture University of Plovdiv; the National Plant Protection Service (and its Regional Plant Protection Services); Unipest Control; the Vegetable Crops Institute; the Customs Authority; the Environmental Inspectorate; FAO; UNDP; training specialists; the Institute for Plant Protection in Kostinbrod; the University of Forestry of Sofia; Yandi and Fitozashtita agricultural supply and service companies (for soil disinfestation); and Agria Plovdiv, Brothers Pilevi, Petromel and Socotab postharvest companies.

963. The NOU/MoEW successfully coordinated the work of these organisations to deliver information on a range of suitable alternatives to the stakeholders. The combination of lectures and hands-on activities expedited the widespread use of alternatives by farmers and the subsequent phase out of methyl bromide. The partnerships formed as a result of the involvement of these stakeholders was assessed as creating effective stakeholder participation to progress the work of the NOU and the MoEW in ozone layer protection.

8.3.3.7.4 Financial planning

964. There was no requirement for co-finance of UNDP and UNEP in this programme. However, France committed to provide $50,000 toward the administrative costs of UNDP and UNEP, but

[115] "The introduction of the most important pests on greenhouse vegetables and their control using methyl bromide alternatives"
[116] 1 FTE to 2004; 2004 – 2006 = 2FTE; 2006 – 2009 = 1FTE; From 2009 1.5 FTE.

these funds did not eventuate[117]. In 2008, UNEP reported that co-financing from four out of the five countries exceeded the co-finance envisaged at the start of the project start[117].

965. In October 2006 at the International Project Steering Committee Meeting in Sofia, the participants recommended that future projects should put in place procedures to source financial support for the use and refinement of alternatives and technology after the project is completed. In 2007, discussions were initiated on potential EC funds that could be used to support long-term research and validation of alternatives.

966. UNEP reported that the funds were correctly managed and transparently accounted for in the project. There was also no concern whatsoever on the financial management and planning as all budgets were managed as expected in the sub-projects and MOUs of the project.

8.3.3.7.5 UNEP supervision and support

967. The major challenges that the MoEW faced at the beginning of the Project was to achieve sufficient administrative capacity to be able to coordinate the Project competently, to cope with unknown and sometimes changing procedures and methods of work involving the implementing agencies (UNEP, UNDP), and to overcome the scepticism towards methyl bromide alternatives expressed by both the fumigators and the farmers that depended on their services.

968. The programme coordinator organised regular meetings of the NSC with the stakeholders to obtain feedback on progress in the various activities. The MoEW coordinated the activities between the Implementing Agencies, the companies and the organisations and institutes that were involved in the implementation of the alternatives. The feedback on the project continued for two years after its completion, in compliance with the requirement for the beneficiaries of the equipment to send a report every 6 months to the Regional Service for Plant Protection in Plovdiv.

969. The programme coordinator reported that the interactions with UNEP were generally positive as UNEP provided help when necessary. However, when some activities in the programme were delayed, MoEW identified the cause of the delay and suggested solutions. When UNDP was involved on some occasions the intervention was successful, but on other occasions the MoEW regretted that it was not always able to solve a fundamental communication problem between the Bratislava and Sofia offices of UNDP.

970. The evaluators assessed UNEP as providing more supervision and support to the MoEW than UNDP which was satisfactory, but the interactions of the MoEW with UNDP were less satisfactory because of poor communication between the Bratislava and Sofia offices of UNDP which resulted in delays importing equipment.

8.3.3.7.6 Co-financing and project outcomes & sustainability

971. There was no requirement for co-finance of the activities of UNDP and UNEP in this programme. However, France committed to provide $50,000 toward the project development costs of UNDP and UNEP, but these funds did not eventuate[118]. The UNEP regional budget included $1,921,929 of in-kind co-finance[119] for non-investment activities, and the UNDP regional budget included expected in-kind contributions of $373,400[120] for investment activities. The amount of co-finance declared by Bulgaria for non-investment and investment activities in this project was not available.

972. In 2008, UNEP reported that in-kind co-financing from four out of the five countries exceeded the co-finance envisaged at the start of the project start117. The co-finance was for office space and facilities for national project personnel and international experts working on the project; for participation of Government personnel that implemented project activities; for providing transportation, facilities for installation of equipment, and logistic support to the project; for communications; for personnel for technical assistance, site visits; and for personnel and other resources for the monitoring and evaluation exercises.

973. A significant level of in-kind co-finance demonstrated the commitment of Bulgaria to the project

---

[117] UNEP. 2008. GEF PIR FY2008. 50 pages
[118] UNEP. 2008. GEF PIR FY2008. 50 pages
[119] UNEP. 2008. UNEP GEF PIR FY 2008 Review 1. For the period 1 July 2007 to 30 June 2008. 50 pp
[120] UNDP. 2003. Total Sector Methyl Bromide Phase Out in Countries with Economies in Transition. GEF – UNDP Project Doc. 29 pp.

and probably increased the Bulgaria's "ownership" of the programme. Increased ownership has been shown in other projects to promote sustainability, since the government and commercial commitment is greater than when there is a financial stake in a successful outcome to the project.

974. Although co-finance is important, there were other factors that were assessed as having a greater impact on the sustainability of the programme than co-finance, such as the EU legislative requirement to eliminate the use of methyl bromide by 31 December 2004 (see Section 8.3.3.6.4). However, a sustainable source of funds to support the continued implementation of alternatives, and the refinement of the alternatives, after the project finished was considered very important by the members of the National Steering Committee at their meeting in October 2006.

8.3.3.7.7 Project implementation delays and impact on project outcomes & sustainability

975. Procurement of equipment by UNDP Bratislava office was delayed because of UNDP difficulties coordinating between the national Customs authorities and the involvement of UNDP personnel in some of the countries in the project. The variety of rules and practices in the different countries was not anticipated by UNDP, and each country had to be addressed individually in each case, which contributed to the overall delay in procurement and imports.

976. Although procurement and project closure were delayed, these delays did not affect the national phase out since appropriate registration and legislative instruments were required by EC legislation to be in place, which prevented any prospect of a return to the use of methyl bromide. Restrictions on methyl bromide use, sale, imports in Bulgaria had been implemented according to Regulation (EC) No 2037/2000 in 2002 which was well in advance of Bulgaria's accession to the EU on 1 January 2007.

977. The inability to register new formulations of traditional fumigants, and to maintain registration for existing fumigants, threatens the ability of users to have access in the longer term to effective pest control procedures.

978. In the pre-harvest sector, there was concern in Bulgaria that metam sodium might not be re-registered and therefore may become unavailable for use in glass houses in the drips that had been established for nematode control. In the post-harvest sector, phosphine generated from the speedboxes had yet to be authorised by the Pesticide Department in Bulgaria. Bulgaria is intending to use the Mutual Recognition Procedure operating between Member States in the EU. However, the European Food Safety Authority Review identified data deficiencies in 2009, which will delay approval.

8.3.3.8 Sub-Project Rating

GF/4040-05-05 Total Sector Methyl Bromide Phase Out in Countries with Economies in Transition - Bulgaria		
Criterion	**Evaluator's Summary Comments**	**Evaluator's Rating**
Attainment of project objectives and results Sub criteria (in yellow below)	See comments below	
Effectiveness	Bulgaria provided materials on alternatives, and training workshops and courses; equipment was installed for pre-harvest and post-harvest uses that controlled pests; 100% phase out of non-QPS uses before the due date of 31 December 2004	HS
Relevance	Conversion to non-ODS technology, awareness raising programmes and other activities were consistent with minimising the detrimental effect of methyl bromide on the ozone layer	HS
Efficiency	About 5 times more expensive than the average cost of programmes implemented in developing countries	S

GF/4040-05-05 Total Sector Methyl Bromide Phase Out in Countries with Economies in Transition - Bulgaria		
Criterion	**Evaluator's Summary Comments**	**Evaluator's Rating**
Sustainability of Project outcomes (overall rating) Sub criteria (in yellow below)	See comments below	
Financial	Most likely delivered within budget; EU monitoring and reporting requirements necessitate ongoing financial support by Bulgaria for methyl bromide reporting; combination of funds for alternatives	HS
Socio-Political	Good socio-political support from government and NGOs that promoted the sustainability of the phase out of methyl bromide	HS
Institutional framework and governance	Many diverse government organisations involved in monitoring and reporting ODS; good institutional framework and governance; data collection and review; early and effective legislation	HS
Environmental	No environmental risks that could potentially undermine the work achieved so far on methyl bromide; Customs officers trained to detect illegal trade; Customs and Environmental Inspectorate co-operate to minimise illegal use and import; penalties for Infringement of EU legislation are dissuasive	HS
Achievement of outputs and activities		HS
Monitoring and Evaluation (overall rating) Sub criteria (in yellow below)	See below	
M&E Design	Annual and Final M&E, good assessments but some limitations in the design; Final Evaluation better than the annual as performance indicators were evident	S
M&E Plan Implementation (use for adaptive management)	Value of the implementation of the M&E was reduced by the performance indicators missing from the annual evaluation; UNEP reported on behalf of UNDP	S
Budgeting and Funding for M&E activities	Budget was about 7% of the total budget assigned to UNEP / UNDP	S
Catalytic Role	No categorisation required	
Preparation and readiness	Well prepared and ready for the project, as evidenced mainly by the legislation and infrastructure for methyl bromide controls that were in place prior to the start	HS
Country commitment and motivation*	Highly committed and motivated as shown by the quality of the training materials, follow up with users, range of equipment implemented and early finish	HS
Stakeholder involvement	Effective stakeholder participation that helped to progress the work of the NOU and the MoEW in ozone layer protection	HS
Financial planning	Adequate with good communication between UNEP and Bulgaria	HS
UNEP supervision and support**	UNEP had a good working relationship with Bulgaria that covered work plan	HS

GF/4040-05-05 Total Sector Methyl Bromide Phase Out in Countries with Economies in Transition - Bulgaria		
Criterion	**Evaluator's Summary Comments**	**Evaluator's Rating**
	implementation, progress reports and financial reporting; good supervision and support by UNEP	
Overall Rating		HS

Highly Satisfactory (HS); Satisfactory (S); Moderately Satisfactory (MS); Moderately Unsatisfactory (MU); Unsatisfactory (U); Highly Unsatisfactory (HU); *Motivation replaced TOR '*driveness*'; **Support replaced TOR 'backshopping'

Blank page for double-sided printing

4 Estonia

8.4.1 Background

979. Estonia began to adopt free-market policies even before it declared independence from the Soviet Union in mid-1991 and has continued to pursue reform aggressively ever since. For example, the government set privatization as an early priority and has now completed the process of putting most major industries in private hands. An integral part of Estonia's transition to a market economy during the early 1990s involved reorienting foreign trade toward Europe[121]: In 1990, about 87% of Estonia's trade was with the Soviet Union, but this fell to less than 10% with Russia in 2007. The fall of the Soviet Union caused a 36% contraction in Estonia's economy from 1990 to 1994, but it picked up again with more than 4% growth in 1995 and 1996. Russia's financial crisis in 1999 led to the only year of decline in Estonia's GDP since 1994, but the 0.7% decline was relatively small.

980. In 1996, Estonia had acceded only to the Vienna Convention and the Montreal Protocol. It was not until 1999 and just before the start of the GEF Project that Estonia ratified the London and Copenhagen Amendments. Today, Estonia has also acceded to the Montreal Amendment and ratified the Beijing Amendment.

981. As a signatory to the Montreal Protocol and some of its Amendments in 1999, Estonia was required to comply with the control schedule applicable at that time to ozone-depleting substances (ODS) which, *inter alia*, required developed countries to phase out the consumption of halon on 1 January 1994; and to phase out CFCs, methyl chloroform and carbon tetrachloride on 1 January 1996. Based on ODS consumption reported to the Montreal Protocol, Estonia was in non-compliance with Annex A Group I (CFCs) each year from 1997 until the end of 2000.

982. In 1998, after a meeting with the Protocol's Implementation Committee[122] to discuss appropriate action as a result of the consumption of CFCs, Estonia committed to a phase-out plan with interim benchmarks that aimed to:

- Reduce consumption by 1 January 1999 to no more than 23 ODP-tonnes of Annex A and B substances;
- Completely phase out consumption of Annex B substances by 1 January 2000;
- Reduce consumption by 1 January 2000 to no more than 14 ODP-tonnes of Annex A substances;
- Reduce consumption of CFC-12 to all but 1 tonne in 2001;
- Completely phase out Annex A substances by 1 January 2002; and
- Establish for 1999 a harmonized system for monitoring and controlling imports of ODS.

983. Estonia was encouraged by the Parties to the Montreal Protocol to work with the relevant Implementing Agencies to reduce the consumption by installing non-ODS alternatives, and to quickly develop a system for managing recovered refrigerants and halon for any continuing critical uses. The Parties noted at the time that, in order to avoid disruption to the users of equipment that depended on ODS for its functioning, actions by Estonia should be taken urgently because of the anticipated closure of CFC and halon 2402 production capacity in the Russian Federation by 2000, which was Estonia's major supplier of CFCs and halon.

---

[121] US State Department. Background Note: Estonia.
[122] Decision X/23. 1998. Compliance with the Montreal Protocol by Estonia.

8.4.2 *Generalised objectives, output and performance indicators*

984. At the outset, the design of the UNEP and UNDP projects in Estonia did not require a clearly defined logframe analysis and Performance Indicators (PIs) when the sub-project was being formulated and approved. The 2004 Mid-Term Evaluation[123] undertaken for the UNEP-managed projects identified the absence of a results-based management and accountability framework, including the lack of PIs.

985. In the absence of these PIs, this Terminal Evaluation Assessment used the Project Outputs & Outcomes as well as PIs from the 2004 Mid-Term Evaluation for the assessment of each of the sub-projects. Table 37 summarises these generalised objectives, outputs and outcomes that were used as a guide in the assessment of the methyl bromide sub-project in this Estonia Country Report[124].

Table 37: Generalised objectives, outputs and outcomes that were used as a guide in the assessment of each sub-project

Objectives/Intended Results	Outputs/Deliverables	Outcomes/Performance indicators
1. Strengthening of the national capacity to effectively coordinate and administer the actions outlined in the Country Programme and the Refrigerant Management Plan	1. Establishing the National Ozone Unit and initiating actions that created a suitable climate in the country for the expeditious phase-out of ozone-depleting substances (ODS) 2. Political priority assigned by the Government to environmental issues and to the objectives of the Montreal Protocol in particular	1. Strengthened institutional capacity and improved coordination among stakeholders: • Time required for UNEP to disburse the first funding tranche • Timely recruitment of sufficient and qualified National Ozone Unit staff • Timely establishment of adequate infrastructure • Provision of the counterpart funding • Continuity of National Ozone Unit staff and operation • Ratification of Montreal Protocol Amendments • Establishment of the Interagency Committee • Approval of the Action Plan • Access of National Ozone Unit staff to decision makers
2. Legislative measures that promote the phase-out of ODS	3. Development, promotion and adoption of legislative acts and regulations on control of ODS	2. Introduction of legal acts regulating ODS import related issues and their enforcement: • Adoption of legislation on ODS import/export licensing system • Establishment of ODS import quota system • Register of authorized importers • Introduction of ban on trade of ODS and equipment containing ODS • Adoption of qualification requirements for servicing activities • Adoption of legislation that mandates ODS recovery, reclamation and recycling • Measures on enforcement of

[123] Buxton, G.V. and R. Ciconkov. 2004. A Mid-Term Evaluation of UNEP's GEF-Sponsored Capacity Development and Institutional Strengthening Projects in Countries with Economies in Transition. Report prepared for UNEP-EO. 174pp.

[124] As each Country Report is a self-contained chapter with its own Annex, for completeness (but at the expense of repetition) the same Table showing these generalised objectives, outputs and outcomes was provided in each Country Report.

Objectives/Intended Results	Outputs/Deliverables	Outcomes/Performance indicators
		legislation through training of customs officers • Change of market price between CFCs and substitutes
3. Increased coordination and monitoring of the Country Programme and the Refrigerant Management Plan	4. Effective interaction with governmental institutions and agencies 5. Increased cooperation with business sector and professional associations 6. Assistance in the coordination and monitoring of the implementation of investment and training sub-projects executed by Implementing Agencies as part of the Refrigerant Management Plan	3. Improved coordination and monitoring in implementation of the Country Programme and the Refrigerant Management Plan: • Evidence of access of National Ozone Unit to, and interaction with, decision makers • Involvement of private sector stakeholders • Establishment and support of the Refrigeration Association • Successful completion of training of custom officers together with UNEP • Successful completion of training of good servicing practices • Successful completion of training of ODS recovery, reclamation and recycling operators • Successful completion of conversion of to non-ODS technology
4. The design and implementation of ODS awareness programme	7. Conducting awareness workshops for central and regional governmental officials, environmental inspectors and customs officers on Montreal Protocol objectives 8. TV and radio interviews on ozone layer protection issues 9. Dissemination of booklets about ozone layer protection, and implementation of National ODS Phase out Programme	4. Improved communication with, and effective engagement of governmental and non-governmental institutions, professional organizations, private sector and general public, in ODS phase out activities 5. Reduction of ODS consumption due to public awareness programme • Number of workshops and degree of participation of institutions listed in (4) above • Number of publications prepared and disseminated • Degree of market penetration of ODS-free products and methodologies
5. Support and encourage local industry and technical institutes to adopt ODS-free substitute technologies	10. Support in conversion of manufactured equipment to non-ODS technology 11. Coordination in the provision of modern tools and equipment to servicing workshops in the domestic, commercial refrigeration and air-conditioning sectors	6. Adoption ODS-free substitute technologies 7. Adoption of good servicing practices and availability of modern tools in the refrigeration sector, including recovery and recycling • ODP-tonnes phased out • Number of servicing sets provided to servicing enterprises
6. The collection of required data on ODS use and consumption, establish the lines of communication in the country and reporting to the Ozone Secretariat and Implementing Agencies	12. Collection, analysis and exchange of Montreal Protocol-related information in the country and the region 13. Preparation of annual reports on ODS consumption and National	8. Establishment the line of communication with the Customs authority and licensed importers as a means of collecting ODS import data 9. Establishment the line of communication with National

Objectives/Intended Results	Outputs/Deliverables	Outcomes/Performance indicators
	Ozone Unit activities to the Ozone Secretariat 14. Preparation and submission of necessary information and reports to the Implementing Agencies 15. Exchange of experience between the National Ozone Unit and other Network members to combat illegal trade in ODS, including sub-regional cooperation	Ozone Units in border countries: • Creation of ODS database • Availability of Montreal Protocol-related information on the Ozone-Secretariat website • Reports of the Implementation Committee • Participation in Central Asia and Eastern Europe Networking • Assessments of the quality of the National Ozone Unit reports by Implementing Agencies
7. Country reduction and phase out of the consumption of controlled ODS by the agreed date	16. Coordination of the implementation of the National ODS Phase out Programme	10. Compliance with ODS phase out schedule established by the Parties in a specific Decision, as a result of the considerations of the Protocol's Implementation Committee

8.4.3 Sub-Project finance

986. The *UNDP/UNEP* Project was approved on 9 February 2000 and completed in December 2007, after 3 extensions when additional time was necessary to finalise sub-project implementation. The GEF Grant of $750,895 was matched by $45,000 of co-finance (in-kind) from the Government of Estonia. The refrigeration sector accounted for 75% of the ODS consumption in 1998. The Project was seen as particularly important by Estonia at that time for addressing the growing transit trade in ODS between Russia and Europe.

987. The main GEF-funded project in Estonia was GEF-768 which aimed to phase out 54.8 ODP-tonnes of mainly CFCs. It was sub-divided into four sub-projects:

- GF/4040-01-07 – Institutional Strengthening and Capacity Building Establishment of an Ozone Office (UNEP)
- GF/4040-02-05 – Train the trainers for use of ODS-free refrigerants in maintenance and servicing (UNEP);
- Index unavailable – National programme for recovery and recycling of ODS refrigerants (UNDP/UNOPS);
- Index unavailable – Regional halon management stockpile programme (UNDP/UNEP);

988. Estonia was unique among the 17 CEITs as it was the only country that did not receive funding for the phase out of ODS in enterprises.

8.4.4 GF/4040-01-07 Institutional Strengthening and Capacity Building Establishment of an Ozone Office (UNEP)

8.4.4.1 Introduction

989. The objectives of the Project were to build and strengthen Estonia's institutional capacity to eliminate ozone-depleting substances through the effective implementation of its Country Programme and Refrigerant Management Plan. The Plan required Estonia to accurately monitor and report on the reductions and elimination of ozone-depleting substances, in order to comply with the requirements of the Montreal Protocol. This required specific financial support to:

- Train the trainers in refrigerant recovery;
- Establish a network of refrigerant recovery, reclamation and recycling operations; and
- Provide a (Baltic) regional centre for the recovery and reclamation of halon.

990. The total sub-project cost was $271,800 which included $45,000 of finance from the government of Estonia.

991. With strengthened institutional capacity, Estonia would effectively carry out awareness raising activities with national stakeholders on the environmental damage caused by ODS, and how this

could be avoided with the use of substitutes to replace ozone-depleting substances. In regard to training, policy instruments would be established to facilitate the implementation of codes of good practice and a certification scheme for refrigeration and air-conditioning technicians. Custom officials would be advised on how to control imports and exports of ODSs and ODS-dependent equipment. A training infrastructure would be established for the ongoing training after the sub-project had been completed.

8.4.4.2 Attainment of objectives and planned results

8.4.4.2.1 Effectiveness

992. The planned outputs / deliverables, as set out in the project documents[125], were as follows:

- Establishment of the National Ozone Office (NOU);
- Adoption of legislative measures for the phase-out of ODS;
- Design and implementation of ODS awareness programmes;
- Provision, coordination and monitoring of an action plan to phase-out ODs; and,
- Collection and accurate reporting of ODS consumption data.

993. The achievement of outputs and activities by Estonia, as measured against these performance indicators, are provided in Section 8.4.6.5.1 "*Delivered outputs*" on page 265.

8.4.4.2.2 Relevance

994. The reduction and phase out of ODS in Estonia is consistent with the objectives of the Vienna Convention and the Montreal Protocol, which *requires Parties to take appropriate measures in accordance with the provisions of this Convention and of those Protocols in force to which they are party to protect human health and the environment against adverse effects resulting or likely to result from human activities which modify or are likely to modify the ozone layer*[126].

995. The GEF established in 1995 an Ozone Layer Depletion Focal Area in response to the Montreal Protocol. The Focal Area has the strategic objective of protecting human health and the environment by assisting countries to phase out their consumption and production of ODS, to prevent emissions of ODS, and to encourage the uptake of alternative technologies and practices according to a country's commitments under the Montreal Protocol. The financial interventions in the GEF Focal Area contribute to the return of the ozone layer to pre-1980 ozone levels, which is expected by 2065.

996. Most recently, the dual capability of ODS to both reduce ozone and to have a detrimental impact on the climate have been described[127]. Global ODS consumption in 1989 was equivalent to about 9,200 million tonnes (9 Gt) CO_2-eq/year, which was reduced to about 1,870 million tonnes (1.8 Gt) CO_2-eq/year in 2007 as a result of ODS phase-out activities under the Montreal Protocol. This reduction of about 7 Gt CO_2-eq/year was at least three times greater than the Kyoto Protocol's reduction target (about 1-2 Gt CO_2-eq/year in 2008-2012), demonstrating that the global ODS reductions achieved so far have already yielded a larger climate benefit than the current Kyoto Protocol target.

997. The actions taken by Estonia to phase out ODS is therefore relevant to further protection of the ozone layer (Montreal Protocol) and relevant to reducing the impact of radiative forcing of the climate (Kyoto Protocol).

8.4.4.2.3 Efficiency

998. The cost-effectiveness as a means of determining 'efficiency' was not relevant as this was an Institutional Strengthening project which is not normally subject to cost-effectiveness comparison. However, the project did leverage $45,000 of additional resources from the government of Estonia, which indicated that the government's environmental objectives were well-aligned with the objectives in this sub-project.

---

[125] Buxton, G.V. and R. Ciconkov. 2004. A Mid-Term Evaluation of UNEP's GEF-Sponsored Capacity Development and Institutional Strengthening Projects in Countries with Economies in Transition. Report prepared for UNEP-EO. 174pp. Page 176.

[126] Handbook for the Vienna Convention for the Protection of the Ozone Layer - 7th Edition (2006). Article 2: General Obligations.

[127] Velders, J.M., Andersen, S.O., Daniel, J.S., Fahey, D.W. and M. McFarland. 2007. The Importance of the Montreal Protocol in protecting climate. http://www.pnas.org/content/104/12/4814.abstract

999. However, efficiency can also be examined in terms of the size of the team in relation to its tasks and achievements. The NOU consisted of 3 FTE - an ODS Specialist, an Office Manager, and a specialist in the Reclamation Centre.

1000. To implement these plans, the NOU, EERC and MoE developed and maintained relations with the Ministry of Social Affairs[128], MoF (which contains the Tax and Customs Board), the Plant Protection Inspectorate in the Ministry of Agriculture (for work on QPS uses of methyl bromide), the Estonian Rescue Service, the Ministry of Defence, the Ministry of Education and Science, Civil Aviation Administration, Estonian Maritime Administration, and the Railway Administration. NGO activity on ODS work also included the Refrigeration Association, the Heat Pump Association and the Security Association.

1001. The NOU is therefore a relatively small team that can operate efficiently in this project to leverage resources to address ODS phase out activities in Estonia.

8.4.4.3 Assessment of sustainability of project outcomes

8.4.4.3.1 Financial resources

1002. The Institutional Strengthening sub-project was completed in December 2007. The field "PDF GEF Cost" in the Final PIR-2006 was not completed by the Fund Management Manager, which precluded an assessment of the financial resources.

1003. The funding for the NOU's operation was provided by MoE through contractual arrangements for specific tasks. A Senior Officer in the MoE provided the link between the NOU and the Ministry.

1004. On 1 May 2004, Estonia acceded to the European Union which resulted in continued access to funds to progress Estonia's political and economic transition in areas that included transport, local development, energy, environment and finance. The NOU also obtained funds for equipment from other sources, such as the Estonian Environmental Investment Fund, and through bilateral agreements on specific projects e.g., with DEFRA (UK) on the importance of the ozone layer and the need for skin protection against high UV levels.

1005. Estonia also has access to the EU's Cohesion Fund which is a structural instrument that helps Member States to reduce economic and social disparities and to stabilise their economies since 1994. The Cohesion Fund finances up to 85 % of eligible expenditure of major projects involving the environment and transport infrastructure. This strengthens cohesion and solidarity within the EU. The least prosperous Member States whose gross national product (GNP) per capita is below 90% of the EU-average are eligible, which includes Estonia. For the Cohesion Funds €15.9 billion (in 2004 prices) were available for the years 2004-2006, with more than half of the funding (EUR 8.49 billion) reserved for activities in Member States that have recently joined the EU.

1006. Estonia *engaged in partnerships with stakeholders* in the industrial and public sectors to implement its strategy of ozone layer protection through extensive awareness raising and legislative activities. The NOU promoted the use of non-ODS substances and technologies. New suppliers of substances were needed from new suppliers that were typically not in the Russian Federation. Some operations such as the training of technicians were self-funding, which promoted the sustainability of training in Estonia.

1007. The NOU reported that its annual contractual arrangement with the MoE reduced its ability to some extent to respond to issues that are pressing, but not in the contract. Contingency funding for the NOU would be allow a degree of flexibility to address such issues, while at the same time maintaining the bulk of the funding to focus on the core business. The budget has not increased in keeping with the '*augmented capacity as a result of the NOU's activities'*. Without flexibility in the budget, there is a risk that activities to immediately reduce ODS would have to be postponed until the activity could be included in the next contract. However, as the NOU and its activities were funded from multiple sources that were both public and private, the evaluation team assessed the prospects of the NOU and its operations continuing as likely.

[128] MSA and its medicinal board have the lead role in relationships with industry & industry associations, on the management of chemicals & their use in products, and public health e.g., Metered-dose inhalers for asthma.

8.4.4.3.2 Socio-political

1008. The NOU and the MoE developed and maintained relations with the Ministry of Social Affairs[129], MoF (which contains the Tax and Customs Board), the Plant Protection Inspectorate in the Ministry of Agriculture (for work on QPS uses of methyl bromide), the Estonian Rescue Service, the Ministry of Defence, the Ministry of Education and Science, Civil Aviation Administration, Estonian Maritime Administration, and the Railway Administration. NGO activity on ODS work also included the Refrigeration Association, the Heat Pump Association and the Security Association. The partnerships formed as a result of these relations were assessed as creating a stable socio-political environment that would help to promote the ongoing work of the NOU and the MOE in ozone layer protection.

1009. A Senior Officer in the MoE provided the link between the NOU and the Ministry. This structure was reported by Estonia to likely improve efficiency and focus more on implementation, while at the same time maintaining a smaller MoE responsible for policy development and legislation on ODS. The future separation of '*policy development*' from '*implementation*' is a socio-political feature of modern government departments in many countries, which was assessed as likely to facilitate the ongoing work of the NOU and the MOE in ozone layer protection.

8.4.4.3.3 Institutional framework and governance

1010. This sub-project and the work of the NOU were assessed as being well-governed as a result of a robust institutional framework. As described above, a Senior Officer in the MoE was mainly responsible for policy guidance, and the NOU was mainly responsible for implementation of the policy. The NOU had good management of the tasks related to the implementation of ozone legislation, awareness programmes, collection of ODS data for reports on consumption, ODS recovery and recycling (refrigerants and halon), and in training technicians in best-practice ODS handling.

1011. Many of these ozone activities were now being linked to similar activities on fluorinated gases, and the linkage into one 'seamless' programme was assessed as beneficial in promoting ongoing activities to improve ozone layer recovery.

8.4.4.3.4 Environmental

1012. There were few environmental risks that, if not controlled, were assessed as likely to undermine the gains in protection of the ozone layer that had been achieved to date. The main risk was the suspension of activities related to the recovery, recycling, reclamation and destruction of ODS.

1013. ODS is shipped to Finland (Ekokem OY), Sweden (Sakab AB) or Norway (Stiftelsen Retur Gass) for destruction, as there are no ODS destruction facilities in Estonia. Halon that cannot be reclaimed can be sent to Sweden (Sakab AB) for destruction when sufficient quantities have been accumulated to make a shipment economic, but so far none has been shipped. The cost was €4-5/kg in 2005. There is a risk that the owners of ODS will not pay for destruction if the price increases above the level that they are willing to pay. The risk of emissions of ODS increases for ODS that is stored and not shipped for destruction.

1014. The NOU, on the basis of informal and rather clandestine surveys, was unable to find any evidence of (illegal) CFCs on the Estonian market. The evaluation team noted that the NOU was active in preventing illegal trade by having trained officers and supportive legislation, and therefore these activities were likely to be beneficial in promoting improvements toward the recovery of the ozone layer.

8.4.4.4 Catalytic role

1015. The key factors influencing catalytic action are *innovation, demonstration, replication and cooperation*. Often a single sub-project was a combination of each of these factors. Government policies, measures and action had a significant impact on the speed and extent of catalytic action. The private sector's involvement in projects and co-financing are crucial, as they have a demonstration and replication role as well as an impact on supplier companies supply

[129] MSA and its medicinal board have the lead role in relationships with industry & industry associations, on the management of chemicals & their use in products, and public health e.g., Metered-dose inhalers for asthma.

funded enterprises with raw materials.

1016. In regard to this project on Institutional Strengthening which targeted improvements to government-run activities, there was no evidence of catalytic action.

8.4.4.5 Achievement of outputs and activities

8.4.4.5.1 Delivered outputs

1017. The planned outputs / deliverables, as described in paragraph 992, were:

- Establishment of the National Ozone Office (NOU);
- Adoption of legislative measures for the phase-out of ODS;
- Design and implementation of ODS awareness programmes;
- Provision, coordination and monitoring of an action plan to phase-out ODs; and,
- Collection and accurate reporting of ODS consumption data.

1018. The delivered outputs are discussed for each of them.

8.4.4.5.1.1 Establishment of the National Ozone Office

1019. The Project was prepared by the Ministry of Environment (MoE). After the preparatory phase, the Estonian Environment Research Centre (EERC, Figure 21) was contracted by the MoE to implement the Governmental Plan for the Phase out of ODS approved by the Government[130]. EERC, a company owned by the MoE, reports to a Supervisory Board consisting of two members from the MoE and two from the Ministry of Finance (MoF).

1020. The [131]National Ozone Unit (NOU) was established within the EERC in December 2000 to fulfil the National Programme for the phase out of ODS established by government decree 531-k. The NOU was given the responsibility to implement the Project, and the national plan to phase out ODS including contributing to the development of legislation on ODS.

1021. The NOU consisted of 3 FTE - an ODS Specialist, an Office Manager, and a specialist in the Reclamation Centre. The budget for EERC's operation was provided by MoE through contractual arrangements for specific tasks. A Senior Officer in the MoE provided the link between the NOU and the Ministry. The NOU also obtained funds for equipment from other sources, such as the Estonian Environmental Investment Fund, and through bilateral agreements on specific projects e.g., with DEFRA (UK) on the importance of the ozone layer and the need for skin protection against high UV levels.

Figure 21: Estonian Environment Research Centre in Tallinn

1022. Since the establishment of an ozone office was one of the performance indicators, this was evaluated as achieved.

8.4.4.5.1.2 Adoption of legislative measures for the phase-out of ODS

1023. This legislation adopted by Estonia was timely as some of it was drafted in 1999 in anticipation of Estonia's accession to the EU in 2004, while other instruments and policies were useful for preventing imports of CFCs at the start of the sub-project.

1024. Legislation was introduced that banned the import of products that contained CFCs and halons in 1999[132]; introduced procedures for licensing ODS in 1999; the import of CFCs and halons was banned in 2002; the Ambient Air Protection Act[133] was developed and implemented, which

[130] EERC was officially established by Decree 531-k of 4 May 1999.
[131] In Estonia called the 'Ozone NOU', but given the acronym NOU (National Ozone Unit) as in the other country reports
[132] Governmental Regulation No 146 of 6 May 1999
[133] RTL, 19.05.2004, 43, 298: Ambient Air Protection Act

included requirements on ODS, labelling of ODS already categorised as waste, and penalties for infringements of the regulations related to ODS; establishment of a national reporting[134] system for recovered, recycled and reclaimed ODS; qualification requirements[135] for persons dealing with ODS and F-gases; and a procedure for keeping log books[136] on equipment containing ODS and F-gases. An ODS licensing system and quotas was also introduced for HCFCs. Some legislation was drafted in 1999 in anticipation of Estonia's accession to the EU in 2004. When it was implemented after accession, Estonian legislation on the same topic was no longer necessary and became invalid.

1025. The driver for legislation in Estonia on ODS from 2002 onwards was Regulation (EC) No 2037/2000, which came into force in the EU on 30 June 2000, as Estonia acceded to the EU on 1 May 2004. Two years prior to accession to the EU and thereafter, members from the NOU and the MoE regularly attended meetings in Brussels related to improvements in the implementation of regulations on ODS. They also attended meetings of the Nordic-Baltic network to discuss a range of ODS-related issues, and engaged in Twinning Project with Germany on modifications that are needed to the ODS legislation to allow control of F-gases.

1026. The adoption of legislative measures for the phase-out of ozone-depleting substances was assessed as delivered.

8.4.4.5.1.3 Design and implementation of ODS awareness programmes

1027. Highly targeted Awareness Campaigns were conducted in 2002 and 2003 and 2004 that encouraged the recovery of unwanted refrigerators that mostly contained ODS. These initiatives included media (TV, radio, press) communications:

2001

- Press releases: 02.02, 04.03, 12.05, 05.08

2002

- Press releases: 27.05, 04.06;16.09, 4.10
- Newspaper articles: 14.06, 22.06, 26.06, 02.07
- Radio interviews: 15.06, 18.06, 03.07
- TV interviews: 16.06, 22.06, 03.07,16.09, 12.11

2003

- Press releases 25.04, 3.11
- Newspaper articles: 15.05, 29.05, 16.09
- Radio interviews: 20.10, 15.09, 5. And 6. 11
- TV interviews: 16.09, 21.11

2004

- Press releases: 1.05, 21.05
- Newspaper articles: 13. 04, 22.05, 16. 09
- Radio interviews: 2.05, 8.05, 17.05, 17.10
- TV interviews: 3.05, 12.05

1028. There was about 4,000 brochures distributed entitled '*Save the Ozone Layer*'. A booklet called '*The Sun, the Ozone Layer and Us!'* was distributed, and an ODS homepage was established. In 2005, the RAL Quality Assurance Association contributed to a seminar on the proper handling of end-of-life refrigerators.

1029. This campaign resulted in almost 5,000 refrigerators being collected by the staff of the NOU during the Project. The NOU estimated that 3 times more used refrigerators were collected by other companies during the campaign period. At that time, the refrigerators were shipped to

---

[134] RTL, 29.11.2004, 80, 537: Requirements for Ozone Depleting Substances and reporting for ODS and F-gases

[135] RTL, 22.03.2005, 32, 446: Competence of Personnel Dealing with Installation, Operation and Decommissioning of Equipment Containing Ozone Depleting Substances and Fluorinated Gases

[136] RTL, 29.11.2005, 114, 1755: Procedure and format for Keeping Logbooks on Equipment containing Ozone Depleting Substances and Fluorinated Greenhouse Gases

Finland for destruction, but today two companies[137] collect and send them to Lithuania.

1030. Estonia is rare in the CEIT countries in that it had a highly targeted awareness campaign that focused mainly on the recovery of unwanted domestic refrigerators. Although there was no baseline established, the performance indicator was the number of refrigerators recovered. The results of the refrigerant recovery are discussed further in the national programme for the recovery and recycling of ODS refrigerants (UNDP/UNOPS) which is described below in Section 8.4.6 *EST/00/G31 National programme for recovery and recycling of ODS refrigerants (UNDP/UNOPS)*.

1031. For the other activities in the Awareness Campaign, there was neither a baseline established, nor performance indicators developed, that could be used to monitor its impact. Therefore, it was not possible to assess its impact in these areas not related to refrigerator recovery.

1032. Training was also an important element for raising awareness. Estonia put in place effective policies and measures to detect and intercept illegal trade in ODS, and to penalise violators. Legislation was in place to support actions taken by Customs to apprehend and penalise illegal trade in ODS. The customs used a range of equipment that varied from relatively inexpensive refrigeration detection kits to sophisticated X-ray machines. Customs officers were trained in the use of this equipment.

1033. There was strong and ongoing cooperation between the NOU, Customs and other departments to review information on illegal trade and to detect ODS violators. All of the documentation associated with ODS imports and exports was checked. The work was assisted by a Guide[138] on ODS-containing products which is used in the Nordic countries. The training of customs officers is further discussed below in Section 8.4.5.2.1.2 *Customs officer training*.

1034. The design and implementation of ODS awareness programmes for the phase-out of ozone-depleting substances in Estonia was assessed as delivered.

8.4.4.5.1.4 Provision, coordination and monitoring of an action plan to phase-out ODS

1035. The NOU developed a plan for a range of activities that required coordination and routine monitoring. They included the Implementation of the "Train the Trainers" Project; A study on comparative choices for destruction of ODS ; the development of a Custom manual and poster; Cooperation with the Environmental Inspectorate and Customs Board to identify breaches of legal acts on ODS; Provision of regular technical advice; Creation of a ODS homepage; Collection of used refrigeration and air conditioning equipment; Implementation of EC legislation in Estonia; and data collection for reports to the EC on methyl bromide, HCFCs used in firefighting and the use of halons. These activities are further elaborated in the following sections.

1036. Estonia wanted SMEs to have been targeted in the Awareness Campaign, in order to quantify the ODS sectoral phase out requirements for possible investment projects. However, investment projects were not developed and Estonia remained as the only one of 17 CEITs that had no financial assistance to assist enterprises to install non-ODS technology. In 1999, the new government instigated reforms that resulted in some companies going bankrupt, e.g., refrigeration railcars that contained ODS, while others that remained were required by the government to finance their own ODS elimination.

1037. Company bankruptcy may have been the reason for no investment projects being formulated in Estonia at that time. There were no investment sub-projects in Estonia because there were no enterprises that were using significant quantities of CFCs. However, there were two companies[139] that produced open cell foam for construction purposes using HCFC-22 and HCFC-141b, who financed their own transition to HFC-134a and HFC-152a.

8.4.4.5.1.5 Collection and accurate reporting of ODS consumption data

1038. An annual report on the consumption of ODS, based on the data collected, was undertaken within the scope of this Institutional Strengthening project. These reports were required under Article 7 of the Montreal Protocol. Initially the reported was undertaken with the assistance of

---

[137] EES-Ringlus and Eesti Elektroonikaromu

[138] Ingrid Kökeritz. 2007. On Products Containing Ozone Depleting Substances. A Guide to Customs Officers and Inspectors in the Nordic Countries. Nordic Council of Ministers, Copenhagen 2007.

[139] Henkel Macroflex and Krimelte

the MoE, but later independently.

1039. The NOU showed a high level of proficiency in ODS reporting to meet the Montreal Protocol and EU requirements. In addition, the NOU provided responses to questionnaires from the EU annually, such as those related to installed halon, methyl bromide (QPS) and ODS recovered and destroyed. The evaluation team concluded that the Institutional Strengthening had enhanced the reporting capacity of Estonia.

1040. The GEF funding probably helped Estonia to sustain the phase out of ODS, as compliance with the Montreal Protocol was achieved *before* the Project started. Estonia failed to comply with its benchmark target commitments in 1999 and 2000, but did achieve them in 2001 and 2002. From 2002 onwards, Estonia has reported ODS consumption levels that comply with the requirements of the Montreal Protocol.

8.4.4.5.2 Authority / credibility, necessary to influence policy and decision-makers

1041. The NOU has the authority / credibility, necessary to influence policy and decision-makers, which has been shown mainly through the NOUs ability to:

- Assist in the drafting of important legislation for adoption that reduces and eliminates ODS;
- Establish an effective recovery and recycling programme in collaboration with enterprises that recovers and recycles ODS;
- Coordinate training of technicians and customs officers;
- Undertake awareness raising programmes by attracting the interest of the local media and by organising meetings with key stakeholders.

1042. This credibility has been established by an NOU team that has a strong connection to the MoE. The NOU was assessed as well-qualified to carry out tasks on ODS reduction and phase out due to a combination of political, technical and administrative expertise.

8.4.4.6 Assessment of monitoring and evaluation systems

8.4.4.6.1 Monitoring and evaluation design

1043. This project was designed to raise awareness of the phenomenon of ozone depletion; to encourage the use of ODS substitute technology; to strengthen institutional infrastructure to deal with ODS phase-out; to implement procedures to meet and exceed the Montreal Protocol ODS phase-out schedule; and to enable Estonia to reduce and phase out the consumption of ODS as required by the Montreal Protocol for developed countries.

1044. Although there were no Performance Indicators developed when the project was originally formulated[140], the NOU developed some *de facto* Performance Indicators, according to the nature of the supported activity. According to the mid-term evaluators, these were*:*

- Establishment of the ozone office (NOU)
- The facilitation of legislative measures for the phase-out of ODS
- The design and implementation of ODS awareness programs
- Facilitate / enable the collection of the required data on ODS use and consumption;
- Provide coordination and monitoring of an action plan to phase-out ODs; and,
- Facilitate / undertake reporting

1045. As a result, the performance indicators developed by the mid-term assessors were:

- Evidence of enhanced capacity and actions that create a suitable climate in the country for the expeditious phase-out if ODS;
- Evidence that alternative technologies have been adopted;
- The timely phase-out of ODS consumption;
- Evidence of increased coordination, promotion and monitoring of in-country activities

[140] Buxton, G.V. and R. Ciconkov. 2004. A Mid-Term Evaluation of UNEP's GEF-Sponsored Capacity Development and Institutional Strengthening Projects in Countries with Economies in Transition. Report prepared for UNEP-EO. 174pp. Page 87.

for phasing out ODS;

- Evidence of improved collection, analysis and dissemination of information within the MP family of nations; and
- Evidence of improvements in reporting systems on national data on ODS consumption

8.4.4.6.2 Monitoring and evaluation plan implementation

1046. UNEP intended the Project Manager (PM) and the Task Manager (TM) to rate the risks as low, medium, substantial, high, not applicable or to be determined. In practice, UNEP completed only the PM rating as the PM and the TM were the same person.

1047. UNEP in 2006 characterised Estonia's management of the Project as mostly low but some medium risk in for the following criteria: Management structure and governance, work flow, implementation, budget, financial management, reporting, stakeholder involvement, communication, leadership, short term / long term balance (for sustainability and replication), science and technological issues (follows TEAP closely), and political influence (full political support and engagement).

1048. There was no evidence of adaptive risk management by UNEP which, based on the above ratings assessment by UNEP, would have been minimal because Estonia was performing well in all of the tasks rated by UNEP. The criteria rated by UNEP were more general and not well matched with the PIs used by the mid-term assessors. UNEP also circumvented the use of a TM to rate Estonia's performance which in this case was not consequential but it could have been useful for other countries that were not performing well.

1049. In the absence of evidence of any plan implementation by UNEP, the NOU coordinator and/or MoE representative met on a regular basis with other departments and the private sector to monitor and evaluate work on ozone-layer protection in Estonia. The meetings reviewed progress on projects, discussed reports, and highlighted problems and suggested solutions. The NOU coordinator informed participants of key outcomes of national and international meetings.

1050. The NOU coordinator prepared and submitted reports to UNEP quarterly, half-yearly or annually depending on the reporting requirement. The Coordinator was well-organised with clearly labelled dossiers and well-indexed information that could be easily accessed, which facilitated monitoring and reporting in an efficient, comprehensive and timely manner.

8.4.4.6.3 Budgeting and Funding for monitoring and evaluation activities

1051. The evaluation team focused on the outcomes of the projects rather than the detail of the financial expenditure. In general, the NOU prepared the financial plan in coordination with the NOU accountant. Quarterly financial reports were submitted to UNEP.

1052. Financial auditing (including NOU expenditures) were audited on an annual basis by an independent auditor, as well as MoE expenditure. Copies of the audit reports are forwarded to UNEP. The financial planning and management aspects were assessed as satisfactory, timely and efficient.

8.4.4.6.4 Long-term monitoring

1053. Article 7 "Reporting of data" mandates Parties to the Montreal Protocol to report by 30 September each year on their consumption and production of ODS in the previous year. Decision XV/15 in 2003 encouraged Parties to forward data on consumption and production to the Secretariat as soon as the figures became available, and preferably by 30 June each year, rather than 30 September in order to facilitate the work of the Implementation Committee. The Secretariat reported recently that most Parties are able to comply with the June requirement.

1054. Data reporting on consumption is the most important action on long-term monitoring and a '*litmus test*' of progress in the phase out of ODS and the sustainability of the phase out. The Implementation Committee has not remarked on any aspects of data reporting by Estonia, which suggest that reporting has been timely and accurate. Data reporting, and the infrastructure necessary for this, is expected to continue to be included in the annual budget by the government of Estonia for work assigned to the NOU.

8.4.4.7 *Assessment of processes that affected attainment of project results*

8.4.4.7.1 Preparation and readiness

1055. The GEF approved the project on 1 February 2000 and UNEP approved the Institutional Strengthening sub-project in April 2002, some 27 months after GEF approval. Estonia adopted legislation prior to the start of the Institutional Strengthening sub-project and during the term of the project, which concluded in May 2004. The legislation included a ban on the import of products that contained CFCs and halons in 1999[141]; procedures for licensing ODS in 1999; a ban on the import of CFCs and halons in 2002; and the development and implementation of the Ambient Air Protection Act[142] in 2004, which included requirements on ODS, labelling of ODS already categorised as waste, and penalties for infringements of the regulations related to ODS; establishment of a national reporting[143] system for recovered, recycled and reclaimed ODS; qualification requirements[144] for persons dealing with ODS.

1056. The driver for legislation in Estonia on ODS from 2002 onwards was Regulation (EC) No 2037/2000, which came into force in the EU on 30 June 2000, as Estonia acceded to the EU on 1 May 2004. Two years prior to accession to the EU and thereafter, members from the NOU and the MoE regularly attended meetings in Brussels related to improvements in the implementation of regulations on ODS. They also attended meetings of the Nordic-Baltic network to discuss a range of ODS-related issues, and engaged in Twinning Project with Germany on modifications that are needed to the ODS legislation to allow control of F-gases.

1057. The evaluation team assessed Estonia as well prepared and ready for undertaking the tasks in the Institutional Strengthening sub-project.

8.4.4.7.2 Country commitment and motivation

1058. There were many indicators that demonstrated Estonia's commitment and motivation to the reduction the Institutional Strengthening sub-project, including the early preparation and adoption of legislation on ODS as described above; the establishment of an effective NOU for implementing policy developed by the MoE; consistent funding from the central government budget, supplemented by funding from other sources for specific projects; training of technicians in best-practice management of ODS; training of customs officers in the detection of ODS and ODS-containing equipment; participation in awareness raising activities in collaboration with national stakeholders; preparation of materials to promote the adoption of ODS-free technology and methods; participation in meetings with the EU (which started prior to accession) and Parties to the Montreal Protocol; and submission of reports on ODS to the EU and other bodies (such as the Ozone Secretariat). Estonia has a team that collaborates well with partners, monitors the phase down of ODS and continues to develop strategies to ensure that the ODS phase out remains permanent. For these reasons, the evaluation team assessed Estonia as fully committed and motivated toward protection of the ozone layer.

8.4.4.7.3 Stakeholder involvement

1059. The NOU is fully engaged a wide range of stakeholders to assist it with the phase out of ODS in Estonia. These included Ministry of Social Affairs[145], MoF (which contains the Tax and Customs Board), the Plant Protection Inspectorate in the Ministry of Agriculture (for work on QPS uses of methyl bromide), the Estonian Rescue Service, the Ministry of Defence, the Ministry of Education and Science, Civil Aviation Administration, Estonian Maritime Administration, and the Railway Administration. NGO activity on ODS work also included the Refrigeration Association, the Heat Pump Association and the Security Association.

1060. The partnerships formed as a result of these relations were assessed as creating effective stakeholder participation to progress the work of the NOU and the MOE in ozone layer protection.

---

141 Governmental Regulation No 146 of 6 May 1999

142 RTL, 19.05.2004, 43, 298: Ambient Air Protection Act

143 RTL, 29.11.2004, 80, 537: Requirements for Ozone Depleting Substances and reporting for ODS and F-gases

144 RTL, 22.03.2005, 32, 446: Competence of Personnel Dealing with Installation, Operation and Decommissioning of Equipment Containing Ozone Depleting Substances and Fluorinated Gases

145 MSA and its medicinal board have the lead role in relationships with industry & industry associations, on the management of chemicals & their use in products, and public health e.g., Metered-dose inhalers for asthma.

8.4.4.7.4 Financial planning

1061. Both the Ministry of Environment and the NOU managed the finances associated with ozone layer protection. The NOU determined and defined the financial needs and the Ministry reviewed the request and assigned the funds for the Project. Quarterly financial reports were prepared by the NOU and submitted to the Ministry. The decision process appeared timely and efficient. Financial auditing of NOU and MoE expenditure was undertaken annually by an independent auditor.

1062. The financial planning responsibilities shared by the MoE and the NOU were assessed as appropriate, timely, focused and effective.

8.4.4.7.5 UNEP supervision and support

1063. UNEP was the lead agency in the Country Programme preparation and in the implementation of Institutional Strengthening and Capacity Building, awareness raising and training activities. UNEP DTIE (Paris) was the responsible supervising organisation from the inception of the NOU in Estonia in 2000 until 2003. This period was the period of initiation and learning for the newly formed NOU. UNEP GEF (Nairobi) took over the supervisory role from 2004 onwards.

1064. The NOU did not advise the evaluation team of any visit to Estonia by UNEP, and therefore UNEP's role in supervision and support was assessed as minimal in this Institutional Strengthening sub-project, based on the performance of Estonia which UNEP rated as low risk of failure for almost all activities.

8.4.4.7.6 Co-financing and project outcomes & sustainability

1065. The government of Estonia declared $45,000 of co-finance for the Institutional Strengthening sub-project. There was no description provided by Estonia for how the co-finance was allocated to the project.

1066. There have been no official lists of leveraged resources for the projects of the Ozone portfolio, as this was never mandatory for Ozone projects. However, with the extension of projects, and expansion of some of the originally designed activities, the Government has probably allocated financial resources in support of ozone layer protection. This funding has been important for sustaining the outcome of the sub-projects.

8.4.4.7.7 Project implementation delays and impact on project outcomes & sustainability

1067. There was a 27 month delay between approval of the Project by the GEF and signature by UNEP of the Institutional Strengthening sub-project. The reason for the delay was not determined.

1068. The NOU considered that the Project was implemented too late to have a large impact on the recovery of CFCs, and the 27 month delay would have contributed to the delay in the start date. There was a substantial decline in CFCs from 1995 to 1996 due to the bankruptcy of Ookean Ltd that owned a fleet of 20 large fishing vessels that contained refrigeration equipment that operated on CFCs, including 5 very large factory ships. There was no report of the CFCs from these ships being recovered, probably because there was no requirement to recover these CFCs at that time. In this regard, the delay affected the project outcome. This aspect is discussed further in the Section 8.4.6 "*National programme for recovery and recycling of ODS refrigerants (UNDP/UNOPS)*".

1069. In terms of overall sustainability, the delay may have improved the prospects for sustainability since it brought the project closer to the time that Estonia acceded to the EU, and entered into a period of substantial commitment to EC legislation on ozone layer protection.

8.4.4.8 Sub-project rating

GF/4040-01-07 - Institutional Strengthening and Capacity Building Establishment of an Ozone Office (UNEP)		
Criterion	**Evaluator's Summary Comments**	**Evaluator's Rating**
Attainment of project objectives and results Sub criteria (in yellow below)	See comments below	
Effectiveness	The objectives were achieved: establishment of the NOU, legislation implemented, awareness programmes carried out, ODS reduced, and consumption data reported annually	S
Relevance	The achievement of the above deliverables was consistent with minimising the detrimental effect of ODS on the ozone layer	HS
Efficiency	A relatively small team in the NOU leveraged national resources to coordinate the conversion to CFC-free technology in a cost-effective and timely manner	S
Sustainability of Project outcomes (overall rating) Sub criteria (in yellow below)	See comments below	
Financial	Delivered within budget and rated satisfactory	S
Socio-Political	Wide range of stakeholders that promoted progress on ODS phase out; NOU as the implementer and Ministry as responsible for policy development	S
Institutional framework and governance	Strong Ministry support for the NOU, and useful legislative measures	HS
Environmental	Vigilant NOU and supportive legislation and stakeholders results in low environmental risk	HS
Achievement of outputs and activities		
Monitoring and Evaluation (overall rating) Sub criteria (in yellow below)	See below	
M&E Design	Project Document did not develop PIs, but those that were inferred for the project were monitored by the NOU	S
M&E Plan Implementation (use for adaptive management)	There was little evidence of adaptive management, but Estonia's good performance meant that the M&E implementation was less important	S
Budgeting and Funding for M&E activities	Not determinable from the documentation provided	MS

GF/4040-01-07 - Institutional Strengthening and Capacity Building Establishment of an Ozone Office (UNEP)		
Criterion	**Evaluator's Summary Comments**	**Evaluator's Rating**
Catalytic Role	No categorisation required	
Preparation and readiness	Legislation prepared and adopted in advance as well as other activities indicated a highly satisfactory level of readiness and preparation	HS
Country commitment and motivation*	Estonia was highly committed to the establishment of the NOU, legislation to restrict ODS, awareness programmes, ODS reduction, and reporting of consumption data annually	HS
Stakeholders' involvement	The project involved the relevant stakeholders and made use of the skills, experience and knowledge of key national and international organisations	S
Financial planning	Estonia has in place efficient financial procedures and planning of the budget to fund ODS reduction and phase out activities	HS
UNEP supervision and support**	Minimal	S
Overall Rating		HS

Highly Satisfactory (HS); Satisfactory (S); Moderately Satisfactory (MS); Moderately Unsatisfactory (MU); Unsatisfactory (U); Highly Unsatisfactory (HU); *Motivation replaced TOR '*driveness*'; **Support replaced TOR 'backshopping'

8.4.5 GF/4040-02-05 Train the trainers for use of ODS-free refrigerants in maintenance and servicing (plus Customs officer training added later) (UNEP)

8.4.5.1 Introduction

1070. The "*Train the Trainers Project*" aimed to provide technical information / training to refrigeration and air-conditioning technicians in best practice handling of ODS that would reduce ODS consumption (including emissions) during servicing. The first phase required a limited number of personnel to be trained ("*train the trainers*"). The second phase used these trained personnel to train the remaining technicians.

1071. During the implementation of the first phase, it became apparent that illegal trade in ODS could undermine the gains in ODS reduction and phase out. To address the problem of illegal trade, Estonia decided to implement a system of harmonized custom codes that identified ODS imports, to develop export / import control measures, and to train customs officials in methods to detect illegal imports of ODS and ODS-containing equipment. Estonia funded the training of Customs officers and their detection equipment from the budget originally assigned by UNEP for sub-project GF/4040/01/07 on Institutional Strengthening.

1072. The sub-project was approved by the GEF in November 2000, the first training was undertaken in October 2002 (one year later than scheduled) and the sub-project was completed in 2005. The budget allocated by UNEP was $123,476 including the 8% implementing agency fee of $9,146. In addition, there was co-finance of $30,000 by Estonia for the production of the Training Manual. The sub-project intended to eliminate 8 tonnes of ODS over a 3 year period which was estimated to be 20% of the use of ODS in the refrigeration sector.

8.4.5.2 *Attainment of objectives and planned results*

8.4.5.2.1 Effectiveness

8.4.5.2.1.1 Refrigeration and air-conditioning technician training

1073. The project had the following objectives and goals:

- Make technicians aware of ODS issues and needs;
- Build local capacity to create Codes of Good Practice;
- Build capacity of technicians to ensure ongoing use of best practices;
- Assist the Government to sustain training with respect to proper handling of new refrigerants by introducing these into curricula and thus strengthening of the training centres;
- Assist Estonia to minimize uncontrolled emissions of ODS which in turn will lead to consumption reductions

1074. Implied Performance indicators[146] for refrigeration training:

- Evidence of assistance provided to the Government of Estonia to draft and implement Codes of Good Practice for this sub-sector;
- Evidence that refrigeration courses in technical schools now cover ozone layer protection and good practices are part of the curriculum;
- Evidence that local refrigeration technicians are able to service refrigeration equipment in a way that reduce losses by 20-30%;
- Evidence (where possible) that this project has led to a reduction in ODS consumption;
- Evidence of Manual of Good Practice for Refrigeration produced and distributed.

1075. The *specified Performance Indicators* (in the Project Document for Estonia - refrigeration)

- Training of 20 refrigeration technicians in Phase I by Sept 2002;
- Training of 120 refrigeration technicians in Phase II by July 2004;
- Purchase of Equipment for one training centre by December 2002;
- Inclusion of the training module in the training institution by July 2004

1076. In regard to attainment of the *specified Performance Indicators,* 15 refrigeration technicians qualified as trainers in a 5-day course conducted in October 2002. A Canadian expert delivered the course, which covered both theory and good practice in refrigerant recovery as well as alternatives available to replace CFCs. Training of a further 59 trainers in 3 seminars was organised by the Maritime Academy[147] and the Refrigeration Association in March and April 2003, with a focus on practical proficiency. As the number of trainers trained was 4-5 times more than specified in the Performance Indicator, the *trainers trained* component of the programme was assessed as highly satisfactory.

1077. In March 2004, the Refrigeration Association provided four one-day courses for 59 technicians, largely in response to the EU requirements for qualifications. A further 26 were trained, some of them at the Maritime Academy, in accordance with the additional qualification system described by the Professions Act. Õpimaja company provided training in refrigeration to 49 people from 2000-2008. In total, the NOU estimated that more than 200 personnel have been trained as refrigeration technicians during the period 2000 - 2008 in Estonia. As the number trained was 43% more than specified in the Performance Indicator, the training of technicians was assessed as highly satisfactory.

1078. In 2003, the NOU supplied equipment to the Estonian Maritime Academy training facility, which was used for practical "hands on" training for refrigeration technicians. In addition, equipment was supplied to the ODS Recycling Centre which is described further below in the sub-project on

---

[146] Buxton, G.V. and R. Ciconkov. 2004. A Mid-Term Evaluation of UNEP's GEF-Sponsored Capacity Development and Institutional Strengthening Projects in Countries with Economies in Transition. Report prepared for UNEP-EO. 174pp. Page 96.

[147] The Maritime Academy offers a 4y engineering course for ship technicians and there were 18-20 graduates in 2008. Land-based technicians require 2y of classroom teaching and 2 months practical training. In contrast, the Refrigeration Association focuses on training refrigeration technicians on 1-day courses that provide information on best practice.

halon. The NOU distributed electronic documents to participants including a Manual entitled *"Good Practices in Refrigeration"*, and 20 copies in hardcopy for the training centres. The supply of training equipment and distribution of *"Good Practices in Refrigeration"* were assessed as highly satisfactory.

1079. The training module for technicians was included as a module for delivery by the Maritime Academy, in accordance with the additional qualification system described by the Professions Act. The training of technicians can be quite extensive depending on the programme (3 levels) and the delivery organisation. Level I refrigeration mechanics were trained by OÜ Õpimaja, a private company operating with an educational license issued by the Ministry of Education and Science. The company provided basic training courses in different specialties, one of those being training for refrigeration technicians. The courses take place once a year and are three weeks long. The training is followed by a three month practical work in a refrigeration company. After this the trainees take an exam. The course consists of a theoretical part (120 hours) and hands on part (450 hours). The trainees who pass the exam are given a relevant certificate. The precondition for starting studies to become refrigeration mechanic is at least basic education, followed by vocational training.

1080. Level II refrigeration mechanics are trained by the Marine School of the Estonian Maritime Academy, which is a state owned vocational educational institution with a separate budget. The school teaches Training Module for Refrigerating Plants (21 weeks). The subjects related to refrigeration include; refrigeration equipment on ships (4 weeks); automatic operations of refrigeration equipment on ships (2 weeks); air-conditioning equipment on ships (1 week); operation and checks of refrigeration equipment on ships (2.5 weeks); and professional traineeship (8.5 weeks). The trainees who pass all required assessments, professional traineeship and two complex exams are awarded a diploma/certificate.

1081. Level III refrigeration mechanics are also trained by the Academy, but this level focused on specialised training for ships officers and marine specialists. The graduates of the Academy work as refrigerating engineers on board vessels, in cold storage and other refrigerating equipment, as project leaders in the companies dealing with the design and maintenance of refrigeration and air-conditioner technology. The trainees who have successfully passed the whole training programme will be given the highest level certificate.

1082. Evidence that local refrigeration technicians are able to service refrigeration equipment in a way that reduces losses of ODS by 20-30% was not specifically reported as a result of the training of technicians. However, the amount of ODS recovered and recycled as a result of this programme are shown in Section 8.4.6.5.1.4 on page 266.

8.4.5.2.1.2 Customs officer training

1083. Implied Performance indicators[148] for Customs officer training:

- Number of Custom officials trained;
- Evidence that the Customs officers now understand the ODS issue;
- Evidence that Customs officers are able to detect ODS containing equipment and identify the type of ODS using the equipment supplied;
- Evidence of production and distribution of an operations manuals (country handbook)
- Evidence of adoption, translation and distribution of UNEP's Customs manual;
- Evidence of ODS regulations to restrict imports of ODS;
- Number of enforcement actions on illegal trade and knowledge of adverse ODS environmental impact; and
- Evidence that the Customs officers are able to implement national import and export licensing system.

1084. Ten Customs Officers and 14 Environmental Inspectors were trained on ODS management in November 2003 and 2004. The Tax & Customs Board was provided with 5 Yokogawa refrigerant

[148] Buxton, G.V. and R. Ciconkov. 2004. A Mid-Term Evaluation of UNEP's GEF-Sponsored Capacity Development and Institutional Strengthening Projects in Countries with Economies in Transition. Report prepared for UNEP-EO. 174pp. Pages 95-96.

identification kits. A Handbook was also produced, and a poster to remind officers of the importance of illegal trade in ODS.

1085. The work of Customs focused on a close examination of the import and export documentation, rather than taking samples of refrigerants to determine ODS violations. All of the documentation associated with ODS imports and exports was checked. The work was assisted by a Guide[149] on ODS-containing products which is used in the Nordic countries. Recently, this Guide was updated as a result of a twinning project with Germany on F-gases. The Guide also contained information on ODS in accordance with EC Regulation No 2037/2000.

1086. The Customs officers used a software processing system called COMPLEX to record and interrogate declarations, which allowed goods to be diverted into red, yellow or blue channels for detailed examination. Intelligence work was carried out by Intelligence Department in the Tax & Customs Board, who provided information to the Customs Control Department. There were risk criteria entered into the electronic system for ODS. This resulted in about 3-5% of all imports including ODS being inspected. There were 2 mobile X-ray machines that could be moved between the border points relatively easily to inspect shipping containers, so that contraband goods could be detected even in densely-packed containers.

1087. The Tax & Customs Board also contracted the services of the NOU for advice on ODS legislation and analysis of samples in the laboratories, and they met about 3- 4 times per year. The Tax & Customs Board and the NOU reviewed annually the ODS import & exports *versus* the permits issued, which resulted in 10 companies being fined a total of $5,000 for smuggling. In addition, the ship owners of 2 ships that each had 200 kg of halon for fire protection were fined in 2007 for exporting halon to Russia and Georgia.

1088. We conclude that Estonia had put in place effective policies and measures to detect and intercept illegal trade in ODS, and to penalise violators. Legislation was in place to support actions taken by Customs to apprehend and penalise illegal trade in ODS. The qualification requirements for staff dealing with ODS and F-gases were prescribed[150]. The customs used a range of equipment that varied from relatively inexpensive refrigeration detection kits to sophisticated X-ray machines. There was strong cooperation between the NOU, Customs and other departments to review information on illegal trade and to detect ODS violators. Further work was planned to improve the detection of smuggled ODS, including a study tour to Germany. In the future, the Customs is likely to use risk profiling techniques to identify countries and companies that are most likely to not comply with import legislation. Risk profiling is required in new ODS legislation in the EC that is expected to come into force in 2009.

1089. Although there were no specified Performance Indicators for the customs training component, the Customs officer training was assessed as highly satisfactory since the programme was carried out under the instigation of Estonia, it was over and above their initial requirements in the project, and it was implemented within the funds originally allocated by UNEP for Institutional Strengthening.

8.4.5.2.2 Relevance

1090. The training programme undertaken in Estonia to reduce emissions of ODS is consistent with the objectives of the Vienna Convention and the Montreal Protocol, which *requires Parties to take appropriate measures in accordance with the provisions of this Convention and of those Protocols in force to which they are party to protect human health and the environment against adverse effects resulting or likely to result from human activities which modify or are likely to modify the ozone layer*[151].

1091. The Parties to the Montreal Protocol have agreed three times as many Decisions in the last eight years on ways to combat illegal trade as they had in the previous twelve years of the Protocol's existence, which is a measure of the growing concern that countries have for illegal trade. ODS trade that is transhipped through one country to another is particularly problematical as

---

[149] Ingrid Kökeritz. 2007. On Products Containing Ozone Depleting Substances. A Guide to Customs Officers and Inspectors in the Nordic Countries. Nordic Council of Ministers, Copenhagen 2007.

[150] Regulation no 16 of 11 March 2005. "Competence requirements for staff dealing with installation, operation, decommissioning and leak control of equipment containing ODS and F-gases".

[151] Handbook for the Vienna Convention for the Protection of the Ozone Layer - 7th Edition (2006). Article 2: General Obligations.

procedures and responsibility for monitoring such shipments are less well-defined than for single country destinations. Therefore, the training programme that focused on Customs officers that was undertaken in Estonia to combat illegal trade in ODS was consistent with the objectives of the Vienna Convention and the Montreal Protocol.

1092. The GEF established in 1995 an Ozone Layer Depletion Focal Area in response to the Montreal Protocol. The Focal Area has the strategic objective of protecting human health and the environment by assisting countries to phase out their consumption and production of ODS, to prevent emissions of ODS, and to encourage the uptake of alternative technologies and practices according to a country's commitments under the Montreal Protocol. The financial interventions in the GEF Focal Area contribute to the return of the ozone layer to pre-1980 ozone levels, which is expected by 2065.

1093. Most recently, the dual capability of ODS to both reduce ozone and to have a detrimental impact on the climate have been described[152]. Global ODS consumption in 1989 was equivalent to about 9,200 million tonnes (9 Gt) CO_2-eq/year, which was reduced to about 1,870 million tonnes (1.8 Gt) CO_2-eq/year in 2007 as a result of ODS phase-out activities under the Montreal Protocol. This reduction of about 7 Gt CO_2-eq/year was at least three times greater than the Kyoto Protocol's reduction target (about 1-2 Gt CO_2-eq/year in 2008-2012), demonstrating that the global ODS reductions achieved so far have already yielded a larger climate benefit than the current Kyoto Protocol target.

1094. The actions taken by Estonia in regard to the training of technicians and customs officers are therefore relevant to further protection of the ozone layer (Montreal Protocol) and relevant to reducing the impact of radiative forcing of the climate (Kyoto Protocol).

8.4.5.2.3 Efficiency

1095. The cost-effectiveness as a means of determining 'efficiency' was not relevant as this was a Training project which is not normally subject to cost-effectiveness comparison. However, the project did leverage $30,000 of additional resources from the government of Estonia for the production and distribution of the training manual, which indicated that the government's environmental objectives were well-aligned with the objectives in this sub-project.

8.4.5.3 Assessment of sustainability of project outcomes

8.4.5.3.1 Financial resources

1096. The budget allocated by UNEP was $123,476 including the 8% implementing agency fee of $9,146. In addition, there was co-finance of $30,000 from Estonia for the production of the Training Manual entitled *"Good Practices in Refrigeration*".

1097. In general, the trainee or their company paid about 30% of training fee, and the government the remainder. The NOU regards the investment in training as a major factor that has contributed towards reducing the ability of unregistered technicians to work on refrigerants in Estonia. The self-paying system coupled with financial support from the government was assessed as improving the prospects for sustainability.

8.4.5.3.2 Socio-political

1098. The last training session in Estonia took place after the completion of the Project, which was a 2-day training course that focused on F-gases but also had information on ODS[153]. There was evidence that the scope and frequency of training would increase in the near future because of the requirements for the training of technicians in the environmentally-safe handling of fluorinated refrigerants (F-gases), which was also applicable to ODS and concerns the same technicians that have received the training on safe handling practices for ODS.

1099. The training organisations planned to reduce the training from to three days to one day, as companies could not afford to release staff for several days for training. In addition, training would be undertaken during the winter period when there would be less demand for

[152] Velders, J.M., Andersen, S.O., Daniel, J.S., Fahey, D.W. and M. McFarland. 2007. The Importance of the Montreal Protocol in protecting climate. http://www.pnas.org/content/104/12/4814.abstract

[153] "Enhancing the capacity to reduce emissions of fluorinated gases in Estonia". Twinning project with Germany. 10-11 June 2008.

refrigeration and air-conditioning services. The courses are likely to focus less on recovery, since this is now routine for technicians, but more on the practical aspects of retrofitting alternatives and the likely impact on their businesses and operations of future legislation.

1100. There was no indication that the training of Customs officers would continue in the future. However, there was strong cooperation between the NOU, Customs and other departments as a result of regular reviews of the information generated by Customs as a result of their work on illegal trade in ODS. Further work by Customs was planned to improve the detection of smuggled ODS, including a study tour to Germany.

1101. The prospects for future training of technicians were assessed as good, mainly because of the socio-political environment which valued the training of technicians in the environmentally-safe management of F-gases and ozone-depleting substances. There were no formal plans for further training of Customs officers. However, the communication on ODS between Customs and the NOU was effectively a form of training as it improved the skills of the Customs on ODS and its control.

8.4.5.3.3 Institutional framework and governance

1102. The overall proficiency on ODS and F-gas management will be further supported in the near future by Refrigeration Standards translated into Estonian for refrigerating systems and heat pumps on all aspects of their design, installation and management. Technicians that wanted to receive further training could register on the CRAFT website, which also contained the legislation describing the qualification requirements.

1103. As a result of Estonia becoming a Member State in the EU after the project was completed, there is an EU legislative requirement for technicians dealing in ODS to be formally qualified. Member States are required to take steps to promote the recovery, recycling, reclamation and destruction of controlled substances and to assign to users, refrigeration technicians or other appropriate bodies responsibility for ensuring compliance with the recovered for destruction by technologies approved by the Parties or by any other environmentally acceptable destruction technology, or for recycling or reclamation during the servicing and maintenance of equipment or before the dismantling or disposal of equipment. Member States were required to define the minimum qualification requirements for the personnel involved … and to report to the Commission on the programmes related to the above qualification requirements. The Commission is required to evaluate the measures taken by the Member States. In the light of this evaluation and of technical and other relevant information, the Commission, as appropriate, is required to propose measures regarding those minimum qualification requirements[154]. Furthermore, Member States that fail to comply with the requirements are liable to a penalty, in order to encourage Member States to take action.

1104. Estonia had in place the relevant legislation that required technicians that handled ODS to be trained, the module for the training was included in the educational curriculum, and there were two organisations that could deliver the courses. For these reasons, the institutional framework and governance associated with training was assessed as likely to promote its sustainability.

8.4.5.3.4 Environmental

1105. The ozone-depleting substances recovered in Estonia for the period 2003 to 2006 are shown in Table 38, and are an indication of the environment benefit of the training of technicians on best-practice handling of ODS. However, it was not possible to attribute a specific quantity of ODS that was prevented from being emitted as a result of the training programme for technicians.

1106. The Tax & Customs Board and the NOU reviewed annually the ODS import & exports *versus* the permits issued, which resulted in 10 companies being fined a total of $5,000 for smuggling ODS. The penalty would act as a deterrent to further smuggling of ODS, and thereby reduce the impact of any potential release of smuggled ODS on the environment.

8.4.5.4 Catalytic role

1107. The key factors influencing catalytic action are *innovation, demonstration, replication and*

[154] Paragraphs 1 and 5 of Article 16 in Regulation (EC) No 2037/2000.

cooperation. Often a single sub-project was a combination of each of these factors. Government policies, measures and action had a significant impact on the speed and extent of catalytic action. The private sector's involvement in projects and co-financing are crucial, as they have a demonstration and replication role as well as an impact on supplier companies supply funded enterprises with raw materials.

1108. The main factors influencing catalytic action of technician training in Estonia were *demonstration, replication and cooperation*. The training courses for technicians were delivered on many occasions to demonstrate the use of best-practices. As a result of about 60 trainers trained, more than 200 technicians were trained overall, which indicated a replication factor of about 3-4 times. There was good cooperation between the servicing centres and enterprises, the training organisations, the Ministry of Education, the MoE and the NOU in the up-skilling of technicians.

1109. In contrast, the factor influencing catalytic action of customs officer training was *cooperation*. The NOU, Customs officers and representatives from other departments cooperated with each other by reviewing information generated by Customs as a result of their work on illegal trade in ODS, and decided on the appropriate course of action. Further work by Customs was planned to improve the detection of smuggled ODS, including a study tour to Germany in cooperation with the German Customs Authority.

8.4.5.5 Achievement of outputs and activities

8.4.5.5.1 Delivered outputs

1110. The objectives, goals, and performance indicators for the technician training and the Customs officer training were described in Section 8.4.5.2.1 on page 251. They were to raise the awareness of ODS as an environmental pollutant and how to avoid environmental damage; to train users in best practice handling of ODS using guidance materials and practical training; to provide a degree of permanence for the training through curriculum development and organisations that can deliver course material; and to reduce emissions of ODS and the quantity of ODS emitted during servicing of equipment.

1111. The technician training component was assessed as having been carried out to a high standard. There were several organisations involved in delivering the training, the trainees or their company paid for the training themselves, a Manual on best-practices had been developed and distributed, the training continued after the Project had been completed, and above all the requirement for qualifications was underpinned by legislation. All of these factors increased the likelihood that well-trained technicians will continue to be a part of the refrigerant servicing workforce in Estonia. The courses will be necessary since prior to the start of the programme Estonia estimated there were 450 refrigerant technicians in the country operating from 66 service centres. This project trained about half of them, and therefore there is a need to continue the training to train the remainder.

1112. The training programme for technicians was therefore assessed as timely, useful and highly satisfactory. The number of technicians trained was almost double the original number intended to be trained, and the quality of the training was the best of all of the 17 CEITs reviewed. The courses were extensive covering several months for those technicians that required very specialised knowledge for use in the design of new systems, but less intensive and shorter in time for technicians that needed to know how to handle ODS safely but did not need an in-depth knowledge.

1113. The training programme for Customs officers was much shorter than the course for technicians, and there were only two courses which was far fewer than the courses offered to technicians. Nevertheless, the courses had an impact as the Customs officers were able to intercept illegal ODS and to fine companies for importing ODS without a permit. There was no performance indicator within this sub-project as the Customs Training was added to the ODS phase out programme by Estonia, and paid for by allocation of funding from the Institutional Strengthening budget. On this basis, the training of Customs officers was assessed as highly satisfactory.

8.4.5.5.2 Awareness about ODS, ODS substitute technology, and strengthening of institutional capacities for dealing with ODS phase-out

1114. The courses delivered to technicians and Customs officers included a section on the damage to the ozone layer caused by ODS, the actions taken by the Parties to the Montreal Protocol to reduce and phase out the consumption of ODS, and the substitutes that were being put in place in many countries including Estonia to replace ODS. In this way, both technicians and Customs officers being trained were provided with a more general view of national and international actions to encourage the recovery of the ozone layer. Both technicians and Customs officers may also have been aware of ozone depletion as a result of the awareness programme that targeted the general public and that was undertaken by the NOU using the media (print, radio and television).

1115. As a result of the Institutional Strengthening sub-project, the capacity of the government to undertake, coordinate and monitor projects on ozone layer protection had improved (see Section 8.4.4 on "*Institutional Strengthening and Capacity Building in Estonia*" above). The infrastructure for training had also been strengthened by the legislation that required the training of technicians that handled ODS. Two organisations were assigned responsibility for delivering courses, and in one of them best-practice ODS management had been included as a module within their curriculum and could be offered to students at three levels of proficiency. The requirement under two EU legislative instruments (ODS, F-gases) for training of technicians added a further reason for the permanence of the course materials. As a result, the institutional capacity in Estonia was assessed as capable of delivering courses to technicians after the sub-project had finished.

8.4.5.5.3 Authority / credibility, necessary to influence policy and decision-makers

1116. The NOU staff, Ministry staff, Maritime Academy, Customs Board, and the Environmental Inspectorate were all engaged in the design and implementation of these workshops to train technicians. In addition, the MoE had established three Commissions to provide input to the government's decision making from the private sector, industry associations, NGOs and ENGOs. In practice the NGO/ENGOs were active in other areas rather than ozone layer protection.

1117. The government of Estonia in this sub-project had the ability to influence these decision makers, as evidenced by the important implementation on ODS restrictions that were implemented in a timely manner; national workshops were established for delivery by two organisations (one government and the other private); and to encourage industry as a result of the training of technicians to recover and recycle ODS. This credibility has been established by an NOU team that is well-qualified to carry out tasks on ODS reduction and phase out due to a combination of political, technical and administrative expertise.

8.4.5.6 Assessment of monitoring and evaluation systems

8.4.5.6.1 Monitoring and evaluation design

1118. The Project Document states that *a reporting system will be designed by the local consultant in order to ascertain how CFC refrigerants are being used in key selected refrigeration-servicing companies as a follow-up action. Reports will be produced six months after the end of Phases I and II. The findings in these reports will be included in the Project Completion Report that shall be submitted to the Executive Committee.* The reports by the local consultant were not made available to the evaluation team.

1119. The objectives, goals, and performance indicators for the technician training and the Customs officer training were described in Section 8.4.5.2.1 on page 251.

8.4.5.6.2 Monitoring and evaluation plan implementation

1120. UNEP intended the Project Manager (PM) and the Task Manager (TM) to rate the risks as low, medium, substantial, high, not applicable or to be determined. In practice, UNEP completed only the PM rating as the PM and the TM were the same person.

1121. UNEP in 2006 characterised Estonia's management of the Project as mostly low but some medium risk in for the following criteria: Management structure and governance, work flow, implementation, budget, financial management, reporting, stakeholder involvement,

communication, leadership, short term / long term balance (for sustainability and replication), science and technological issues (follows TEAP closely), and political influence (full political support and engagement).

1122. As a result of this evaluation, UNEP rated the results of the training in Estonia as *a role model for future work on POPs or other chemicals requiring controls. However the slow execution of the training activities prevented that rating of the sub-project as 'Highly Satisfactory'*.

1123. There was no evidence of adaptive risk management by UNEP which, based on the above ratings assessment by UNEP, would have been minimal because Estonia was performing well in all of the tasks rated by UNEP. The criteria rated by UNEP were more general and not well matched with the PIs used by the mid-term assessors. UNEP also circumvented the use of a TM to rate Estonia's performance which in this case was not consequential but it could have been useful for other countries that were not performing well.

1124. In the absence of evidence of any plan implementation by UNEP, the NOU coordinator and/or MoE representative met on a regular basis with other departments and the private sector to monitor and evaluate progress on the implementation of the training workshops in Estonia. The meetings also highlighted problems and suggested solutions. The NOU coordinator informed participants of key outcomes of national and international meetings.

1125. The NOU coordinator prepared and submitted reports to UNEP quarterly, half-yearly or annually depending on the reporting requirement showing the details of the workshop including the names and affiliations of the technicians trained. The Coordinator was well-organised with clearly labelled dossiers and well-indexed information that could be easily accessed, which facilitated monitoring and reporting in an efficient, comprehensive and timely manner.

8.4.5.6.3 Budgeting and Funding for monitoring and evaluation activities

1126. The evaluation team focused on the outcomes of the projects rather than the detail of the financial expenditure. The Project Document budget did not specifically indicate funds for monitoring and evaluation activities, but mentioned $6,000 for a national consultant (see paragraph 1118 above) *to design a reporting system* which may have been for the monitoring and evaluation activities. A further $10,000 was allocated in the budget for *substantive assessment and coordination related to technical and policy issues,* which again could have been for the monitoring and evaluation activities. It was not clear if these funds were intended to be used for monitoring and evaluation activities, and therefore it was not possible to evaluate this aspect.

1127. In general, the NOU prepared the financial plan in coordination with the NOU accountant. Quarterly financial reports were submitted to UNEP. Financial auditing (including NOU expenditures) were audited on an annual basis by an independent auditor, as well as MoE expenditure. Copies of the audit reports are forwarded to UNEP. The financial planning and management aspects were assessed as satisfactory, timely and efficient.

8.4.5.6.4 Long-term monitoring

1128. There was no intention in this sub-project for long-term monitoring as an outcome of the training. However, because of the legislative requirement in the EU for technicians to be qualified (see paragraph 1103 above), and because the European Commission periodically checks on the programmes in place to achieve the training, there is long term monitoring of the continuity of training by the EU.

8.4.5.7 Assessment of processes that affected attainment of project results

8.4.5.7.1 Preparation and readiness

1129. Estonia adopted legislation prior to the start of the sub-project which included a ban on the import of products that contained CFCs and halons in 1999[155]; procedures for licensing ODS in 1999; a ban on the import of CFCs and halons in 2002; and the development and implementation of the Ambient Air Protection Act[156] in 2004, which included requirements on

[155] Governmental Regulation No 146 of 6 May 1999
[156] RTL, 19.05.2004, 43, 298: Ambient Air Protection Act

ODS, labelling of ODS already categorised as waste, and penalties for infringements of the regulations related to ODS; establishment of a national reporting[157] system for recovered, recycled and reclaimed ODS; qualification requirements[158] for persons dealing with ODS.

1130. The driver for legislation in Estonia on ODS from 2002 onwards was Regulation (EC) No 2037/2000, which came into force in the EU on 30 June 2000, as Estonia acceded to the EU on 1 May 2004. Two years prior to accession to the EU and thereafter, members from the NOU and the MoE regularly attended meetings in Brussels related to improvements in the implementation of regulations on ODS. They also attended meetings of the Nordic-Baltic network to discuss a range of ODS-related issues, and engaged in Twinning Project with Germany on modifications that are needed to the ODS legislation to allow control of F-gases.

1131. The evaluation team assessed Estonia as well prepared and ready for undertaking the tasks in the training sub-project.

8.4.5.7.2 Country commitment and motivation

1132. Estonia is strongly committed to ozone layer protection and motivated to continue with this training commitment. This was evidenced by Estonia's early preparation and adoption of legislation on ODS as described above; the collaboration with organisations to deliver the training courses; consistent funding from the central government budget, supplemented by funding from other sources for specific projects; training of technicians in best-practice management of ODS; training of Customs officers in the detection of ODS and ODS-containing equipment; awareness raising activities in the workshops for technicians and Customs officers; and government funding for the preparation and distribution of a Training Manual. Estonia has a team that collaborates well with partners, monitors the phase down of ODS and continues to develop strategies to ensure that the ODS phase out remains permanent. For these reasons, the evaluation team assessed Estonia as fully committed and motivated toward the delivery of further training for technicians.

8.4.5.7.3 Stakeholder involvement

1133. The NOU and MoE developed and maintained relations with the Ministry of Social Affairs[159], MoF (which contains the Tax and Customs Board), the Plant Protection Inspectorate in the Ministry of Agriculture (for work on QPS uses of methyl bromide), the Estonian Rescue Service, the Ministry of Defence, the Ministry of Education and Science, Civil Aviation Administration, Estonian Maritime Administration, and the Railway Administration. NGO activity on ODS work also included the Refrigeration Association, the Heat Pump Association and the Security Association. The partnerships engaged as a result of these relations were assessed as creating effective stakeholder ownership to ensure the continuity of the training.

1134. As discussed in paragraph 1101 above, there were no formal plans for further training of Customs officers. However, the communication on ODS between Customs and the NOU was effectively a form of training as it improved the skills of the Customs on ODS and its control.

8.4.5.7.4 Financial planning

1135. The budget for the NOU's operation was by contract to the MoE for specific tasks, such as reporting, training and other activities. A Senior Officer in the MoE provided the link between the NOU and the MoE. The NOU also obtained funds for equipment from other sources, such as the Estonian Environmental Investment Fund, and through bilateral agreements on specific projects e.g., with DEFRA (UK) on the importance of the ozone layer and the need for skin protection against high UV levels.

1136. The budget was controlled by the Ministry of Environment. Quarterly financial reports were prepared by the NOU and submitted to the Ministry. The financial planning was assessed as appropriate as it allowed this sub-project on training to produce deliverables in a timely (although 1 year late) and cost-effective manner. Financial auditing (including NOU expenditure)

---

[157] RTL, 29.11.2004, 80, 537: Requirements for Ozone Depleting Substances and reporting for ODS and F-gases

[158] RTL, 22.03.2005, 32, 446: Competence of Personnel Dealing with Installation, Operation and Decommissioning of Equipment Containing Ozone Depleting Substances and Fluorinated Gases

[159] MSA and its medicinal board have the lead role in relationships with industry & industry associations, on the management of chemicals & their use in products, and public health e.g., Metered-dose inhalers for asthma.

was undertaken annually by an independent auditor at the same time that the financial audit was undertaken of the Ministry's expenditure. Copies of the financial audit reports were forwarded on a regular basis to UNEP.

8.4.5.7.5 UNEP / UNDP supervision and support

1137. UNEP was the lead agency in preparation and in the implementation of this programme on training activities for technicians. UNEP DTIE (Paris) was responsible for supervising the sub-project from its inception in Estonia in 2000 until 2003. UNEP-GEF (Nairobi) took over the supervisory role from 2004 onwards. The training was delivered mostly in 2003 and 2004 when responsibility for supervision would have been divided between UNEP-DTIE (Paris) and UNEP-GEF (Nairobi).

1138. The NOU did not advise the evaluation team of any visit to Estonia by UNEP, and therefore UNEP's role in supervision and support was assessed as minimal in this training sub-project, based on the performance of Estonia which UNEP rated as low risk of failure for almost all activities.

8.4.5.7.6 Co-financing and project outcomes & sustainability

1139. The government of Estonia contributed $30,000 of co-finance toward the cost of this project, which allowed the preparation, production and distribution of a training Manual entitled *Good Practices in Refrigeration*. The provision of co-finance by Estonia for this Manual was evidence of the government's commitment to the training project and to ozone layer protection in general. The co-finance would have also increased the government's ownership of the training programme, and provided confidence to the two organisations responsible for the delivery of the courses that the government was committed to the training programme in the future.

8.4.5.7.7 Project implementation delays and impact on project outcomes & sustainability

1140. The first training was undertaken in October 2002, one year later than anticipated in the programme. The reasons for the delay were not provided by the NOU, but it may have been related to the late delivery of the ODS recovery and recycling equipment.

1141. In terms of overall sustainability, the delay may have improved the prospects for sustainability since it brought the project closer to the time that Estonia acceded to the EU, and entered into a period of substantial commitment to EC legislation on ozone layer protection.

8.4.5.8 Sub-project rating

GF/4040-02-05- Train the trainers for use of ODS-free refrigerants in maintenance and servicing (UNEP)		
Criterion	**Evaluator's Summary Comments**	**Evaluator's Rating**
Attainment of project objectives and results Sub criteria (in yellow below)	See comments below	HS
Effectiveness	4-5 more trainers trained and 43% more technicians than anticipated; and 100% more Customs officers than anticipated	HS
Relevance	Training technicians to minimise ODS emissions and Customs officers to combat illegal trade in ODS are consistent with minimising the detrimental effect on the ozone layer	HS
Efficiency	A relatively small team in the NOU leveraged national resources to design, coordinate and monitor the training of technicians and Customs officers in a cost-effective and timely manner	HS
Sustainability of Project outcomes (overall rating) Sub criteria (in yellow below)	See comments below	HS
Financial	Delivered within budget and very cost	HS

GF/4040-02-05- Train the trainers for use of ODS-free refrigerants in maintenance and servicing (UNEP)		
Criterion	**Evaluator's Summary Comments**	**Evaluator's Rating**
	effective; technician's payment for some of the fees helped to promote training after the project finished	
Socio-Political	Socio-political environment valued the training of technicians on ODS management of F-gases	S
Institutional framework and governance	Strong management support by the NOU; timely & useful legislation	HS
Environmental	Reduction in ODS emissions difficult to quantify as a result of the training; fines to companies for smuggling ODS discouraged further transgressions and potential emissions of ODS	HS
Achievement of outputs and activities		S
Monitoring and Evaluation (overall rating) Sub criteria (in yellow below)	See below	
M&E Design	Unclear M&E design by UNEP	MS
M&E Plan Implementation (use for adaptive management)	There was little evidence of adaptive management; although Estonia's performance overcame any M&E deficiencies	S
Budgeting and Funding for M&E activities	Not clear from the infomation provided	MS
Catalytic Role	No categorisation required	
Preparation and readiness	Well-prepared as key elements were in place before and during the project, including legislation, training course content, delivery organisations	HS
Country commitment and motivation*	Estonia is highly committed to training and ozone layer protection in general, with the EU legislation on training requirements for ODS and F-gases reinforcing Estonia's motivation	HS
Stakeholders' involvement	The project involved the relevant stakeholders and made use of the skills, experience and knowledge of key national and international organisations	HS
Financial planning	Appropriate for the timely and efficient delivery of the training courses and materials	HS
UNEP supervision and support**	Minimal UNEP supervision and support	S
Overall Rating		HS

Highly Satisfactory (HS); Satisfactory (S); Moderately Satisfactory (MS); Moderately Unsatisfactory (MU); Unsatisfactory (U); Highly Unsatisfactory (HU);
*Motivation replaced TOR '*driveness*'; **Support replaced TOR 'backshopping'

8.4.6 EST/00/G31 National programme for recovery and recycling of ODS refrigerants (UNDP/UNOPS)

8.4.6.1 Introduction

1142. The "*National Programme for Recovery & Recycling of ODS Refrigerants*" aimed to establish a programme for the recovery and recycling of ODS used in refrigeration and air-conditioning equipment in order to avoid imports of CFCs. Estonia received equipment for recovering and recycling ODS in this sub-project, as well as funding for training of personnel in how to use the equipment which was described above. The sub-project intended to eliminate 13.4 ODP tonnes per year over a 3 year period.

1143. UNDP signed the grant agreement on 4 October 2000. The equipment was distributed to servicing companies from February 2001, shortly after the training was completed, to September 2001. The budget allocated by UNDP for the equipment was $286,902. The project was completed by 31 December 2002.

8.4.6.2 Attainment of objectives and planned results

8.4.6.2.1 Effectiveness

1144. The performance indicators for this project were:

- The distribution of 50 recovery machines, 50 manual recovery pumps / bags and 5 recovery and recycling machines to companies;
- Monthly reports submitted for the duration of the project by companies on the quantity of ODS recovered; and
- About 2.3 to 5.2 tonnes per annum of ODS recovered for the period 2003 – 2006, and most of it recycled.

1145. The achievement of outputs and activities by Lithuania in this sub-project on recovery and recycling of ODS, as measured against these performance indicators, are provided in Section 8.4.6.5.1 "*Delivered outputs*" on page 265.

8.4.6.2.2 Relevance

1146. The training programme undertaken in Estonia to recover and recycle ODS is consistent with the objectives of the Vienna Convention and the Montreal Protocol, which *requires Parties to take appropriate measures in accordance with the provisions of this Convention and of those Protocols in force to which they are party to protect human health and the environment against adverse effects resulting or likely to result from human activities which modify or are likely to modify the ozone layer*[160]. The recovery of the ODS and its use for servicing avoided the need for the production of new CFCs, thereby reducing the global impact of CFCs on the ozone layer.

1147. The GEF established in 1995 an Ozone Layer Depletion Focal Area in response to the Montreal Protocol. The Focal Area has the strategic objective of protecting human health and the environment by assisting countries to phase out their consumption and production of ODS, to prevent emissions of ODS, and to encourage the uptake of alternative technologies and practices according to a country's commitments under the Montreal Protocol. The financial interventions in the GEF Focal Area contribute to the return of the ozone layer to pre-1980 ozone levels, which is expected by 2065.

1148. Most recently, the dual capability of ODS to both reduce ozone and to have a detrimental impact on the climate have been described[161]. Global ODS consumption in 1989 was equivalent to about 9,200 million tonnes (9 Gt) CO_2-eq/year, which was reduced to about 1,870 million tonnes (1.8 Gt) CO_2-eq/year in 2007 as a result of ODS phase-out activities under the Montreal Protocol. This reduction of about 7 Gt CO_2-eq/year was at least three times greater than the Kyoto Protocol's reduction target (about 1-2 Gt CO_2-eq/year in 2008-2012), demonstrating that the global ODS reductions achieved so far have already yielded a larger climate benefit than the current Kyoto Protocol target.

1149. The actions taken by Estonia to recover and recycle ODS was therefore relevant to further protection of the ozone layer (Montreal Protocol) and relevant to reducing the impact of radiative forcing of the climate (Kyoto Protocol).

8.4.6.2.3 Efficiency

1150. The cost-effectiveness of the sub-project was $21.41 ODP-kg per year, based on a targeted phase out of 13.4 ODP tonnes and a sub-project cost of $286,902.

1151. This cost-effectiveness of $21.41 ODP-kg per year was more than twice as expensive as the average cost-effectiveness of $9.60 ODP-kg per year reported for MLF-funded projects on

[160] Handbook for the Vienna Convention for the Protection of the Ozone Layer - 7th Edition (2006). Article 2: General Obligations.

[161] Velders, J.M., Andersen, S.O., Daniel, J.S., Fahey, D.W. and M. McFarland. 2007. The Importance of the Montreal Protocol in protecting climate. http://www.pnas.org/content/104/12/4814.abstract

refrigeration recovery and recycling that were implemented in 25 developing countries[162].

1152. This cost-effectiveness was 34-60% more costly than recovery and recycling sub-projects carried out in Latvia ($13.40) and Lithuania ($16.00), which both targeted 10 ODP-tonnes which was similar to Estonia's target. The reasons for a higher sub-project cost in Estonia compared to the other Baltic countries could not be determined.

8.4.6.3 Assessment of sustainability of project outcomes

8.4.6.3.1 Financial resources

1153. The Certificate of Completion for this sub-project was not obtainable, and therefore it was not possible to review the expenditure against budget. In terms of activities after the sub-project was completed, Estonia financed the establishment of a ODS Reclamation Centre at Suur-Sõjamäe in a suburb of Tallinn. The same Centre also houses the Halon recovery and recycling programme, which was the main purpose of the Centre and is evaluated in a separate sub-project below.

1154. After the completion of the sub-project and in 2006, 14,794 unwanted refrigerators were collected by 4 companies. All of the unwanted refrigerators were then shipped to Finland for dismantling and recovery of ODS and key parts, except 1,052 of them that were sent to Germany for the same purpose.

1155. The total weight of shipped household appliances, rather than the number of items of each that was shipped, is recorded and reported by companies in accordance with record keeping procedures[163] implemented by the MoE. The procedures do not require companies to report on the number of individual unwanted refrigerators shipped. Lithuania is therefore responsible for reporting annually to the European Commission on the quantity and type of ODS recovered from refrigerators on behalf of Estonia.

1156. ODS is shipped to Finland (Ekokem OY), Sweden (Sakab AB) or Norway (Stiftelsen Retur Gass) for destruction, as there are no ODS destruction facilities in Estonia. Halon that cannot be reclaimed can be sent to Sweden (Sakab AB) for destruction when sufficient quantities have been accumulated to make a shipment economic, but so far none has been shipped. The cost was €4-5/kg in 2005. There is a risk that the owners of ODS will not pay for destruction if the price increases above the level that they are willing to pay. The risk of emissions of ODS increases for ODS that is stored and not shipped for destruction.

1157. The financial resources in Estonia that resulted in these ongoing ODS activities were assessed as adequate to support the ongoing activities of the recovery and recycling programme after the sub-project was completed.

8.4.6.3.2 Socio-political

1158. The ownership of the recovery and recycling programme for ODS contained in refrigerators is a result of Estonia's commitment to ozone layer protection as a result of the initiatives agreed in the Montreal Protocol. In this regard, the MoE and the NOU are the key organisations that dominate the ownership of this programme. Their ownership in this programme also results in Estonia meeting the requirements of the EU that requires Member States *to take steps to promote the recovery, recycling, reclamation and destruction of [ozone-depleting] substances*[164].

1159. The socio-political environment in Estonia that resulted in ownership of these ODS activities were assessed as adequate to support the ongoing activities of the recovery and recycling programme after the sub-project was completed.

8.4.6.3.3 Institutional framework and governance

1160. The NOU implements MoE policies related to the reduction and phase out of ODS. There are four key Ministries that play a key role in relation to environmental projects: the Ministry of Social Affairs; Ministry of Finance, Ministry of Economic Affairs and the Ministry of Environment.

---

[162] MLF. 2000. Desk Study on Recovery and Recycling Projects. UNEP/OzL.Pro/ExCom/31/18. Data in Annex II analysed by Touchdown Consulting Brussels.

[163] Government Regulation No 28 of 30 January 2006 specifies procedures for establishing and keeping a register of products of concern. Washing machines, refrigerators and heating equipment are not individually indentified.

[164] Article 16 of Regulation (EC) No 2037/2000

The Ministry of Social Affairs manages the use of chemicals and their products for public health protection, and has the primary role of liaison with industry and industry associations. The Ministry of Finance retains Customs (the focus and supporting rationale being tax collection). The Ministry of Economic Affairs has responsibility for ships (transport) and communications. The Moe is responsible for air pollution and other emissions (climate change and ODS).

1161. There are four business lines in the Ministry of Environment: Finance and Administration; International Environmental relations (MEAs); Environmental management; and Nature conservation. The ODS programme involves senior staff in the MoE as the Deputy Minister opened the recovery and recycling workshops. The NOU also collaborated with the Estonian Rescue Board, the Ministry of Defence, the Ministry of Internal Affairs, the Ministry of Education and Science, the Plant Protection Inspectorate, the Civil Aviation Administration, the Estonian Maritime Administration, and the Railway Administration. There is a Steering Committee for the NOU and three Commissions that advise the MoE, which are composed of representatives of the private sector, industry associations and NGOs.

1162. The Institutional framework and governance in Estonia was assessed as adequate to ensure the ongoing activities of the recovery and recycling programme after the sub-project was completed.

8.4.6.3.4 Environmental

1163. There are a number of legislative measures that became applicable in the EU from 1 January 2010 that, when implemented and enforced, will improve the protection of the ozone layer in Europe. Many of them are extensions of the requirements that were present in earlier ODS legislation that was operative from 1 October 1999 until 31 December 2009 and which was operative during the term of this ODS recovery and recycling sub-project.

1164. For example, to reduce the release of controlled substances into the atmosphere, provision should be made by Member States for the recovery of used controlled substances and the prevention of leakages of controlled substances[165]. The European Commission as the 'guardian' of the legislation is required to establish a list of products and equipment for which the recovery for destruction, or destruction without prior recovery of ODS, should be considered technically and economically feasible and therefore mandatory[166].

1165. Directive 2006/12/EC of the European Parliament and of the Council of 5 April 2006 on waste167 and Council Directive 91/689/EEC of 12 December 1991 on hazardous waste168 provide for measures on the environmentally sound disposal and recovery of waste and controls on hazardous waste such as ODS. In this regard, special attention should be paid by Member States to ODS in construction and demolition waste and in equipment falling within the scope of Directive 2002/96/EC on waste electrical and electronic equipment (WEEE)[169].

1166. From 1 January 2010 until 31 December 2014, recycled HCFCs may be used for the maintenance or servicing of existing refrigeration, air-conditioning and heat pump equipment provided that they have been recovered from such equipment and may only be used by the enterprise which carried out the recovery as part of maintenance or servicing or for which the recovery as part of maintenance or servicing was carried out[170]. The Estonian Reclamation Centre received a Gramkow reclamation unit for HCFCs as part of the equipment delivered by the sub-project. It was purchased instead of spare parts with the funds. The machine was unused and training is required on its use. The Centre planned to use the machine for the recovery and reclamation of HCFCs for use in Estonia, as from 1 January 2010 the use of virgin HCFCs will become illegal in the EU for topping up equipment that operates on HCFCs. However, based on the latest requirements in Regulation (EC) No 1005/2009, this HCFC reclamation unit will need to be transferred from the Centre to an enterprise, as recycled HCFCs can only be used by the enterprise which carried out the recovery as part of maintenance or servicing or for which the recovery as part of maintenance or servicing was carried out.

---

165 Preamble number 20 in Regulation (EC) 1005/2009 on ODS

166 Preamble number 26 in Regulation (EC) 1005/2009 on ODS

167 OJ L 114, 27.4.2006, p. 9. Directive 2006/12/EC is repealed by Directive 2008/98/EC of the European Parliament and of the Council of19 November 2008 on waste and repealing certain Directives (OJ L 312, 22.11.2008, p. 3) with effect from 12 December 2010.

168 OJ L 377, 31.12.1991, p. 20.

169 OJ L 37, 13.2.2003, p. 24. (3)

170 Article 11(4) of Regulation (EC) No 1005/2009 on ODS

1167. ODS contained in refrigeration, air-conditioning and heat pump equipment, equipment containing solvents or fire protection systems and fire extinguishers are required to be recovered for destruction, recycling or reclamation, during the maintenance or servicing of equipment or before the dismantling or disposal of equipment[171]. ODS contained in products and equipment is required to be recovered for destruction, recycling or reclamation, or destroyed without prior recovery, if technically and economically feasible [172].

1168. Companies are required to take all precautionary measures practicable to prevent and minimise any leakages and emissions of controlled substances. Refrigeration, air conditioning or heat pump equipment, or fire protection systems, including their circuits, which contain more than 3, 30 or 300 kg or more of ODS, are required to be checked for leakage every 12, 6 or 3 months respectively. Any detected leakage must be repaired as soon as possible and in any event within 14 days. The equipment or system shall be checked for leakage within 1month after a leak has been repaired to ensure that the repair has been effective[173].

1169. The strengthening of environmental legislation in the EU that mandates additional activities on ODS recovery and leakage checking and repair was assessed as adequate to ensure the ongoing activities of the recovery and recycling programme in Estonia after this sub-project was completed.

8.4.6.4 Catalytic role

1170. Some companies did not receive recovery and recycling equipment because they were unwilling to sign a contract with the NOU that placed responsibilities on the company for maintaining the equipment, and for reporting on the amounts of ODS recovered. The Association opined that the recovery equipment was not highly valued by companies since most could afford to buy their own, if a unit was not supplied by the Project. The catalytic role of the sub-project was assessed as virtually non-existent as a result.

8.4.6.5 Achievement of outputs and activities

8.4.6.5.1 Delivered outputs

1171. The performance indicators for this project were:

- The distribution of 50 recovery machines, 50 manual recovery pumps / bags and 5 recovery and recycling machines to companies;
- Monthly reports submitted for the duration of the project by companies on the quantity of ODS recovered; and
- About 2.3 to 5.2 tonnes per annum of ODS recovered for the period 2003 – 2006 (target 13.04 ODP-tonnes)

1172. The delivered outputs are discussed for each of the performance indicators.

8.4.6.5.1.1 Distribution of equipment for recycling and recovery of ozone-depleting substances

1173. UNDP supplied 50 recovery machines, 50 manual recovery pumps / bags and 5 recovery and recycling machines. These were distributed by the NOU to 46 companies and 5 recovery and recycling centres. Each company that received the equipment was under contract to report the amount of ODS recovered and recycled on a monthly basis.

8.4.6.5.1.2 HCFC Reclamation unit

1174. A Gramkow HCFC reclamation unit was allocated to the Estonian Reclamation Centre in lieu of spare parts for the recovery and recycling equipment. The unit was not a performance indicator for the project, but Estonia decided that this would be more useful than the spare parts. Further details on this reclamation unit, including its potential use and training requirements, were provided in Section 8.4.6.3.4 *Environmental* on page 264.

[171] Article 22(1) of Regulation (EC) No 1005/2009 on ODS
[172] Article 22(4) of Regulation (EC) No 1005/2009 on ODS
[173] Article 23(1&2) of Regulation (EC) No 1005/2009 on ODS

8.4.6.5.1.3 Monthly reports on ozone-depleting substances recovered

1175. The 46 companies and 5 recovery and recycling centres that received the equipment was under contract to report the amount of ODS recovered and recycled on a monthly basis.

1176. There have been no reports recently from the companies that received the 3R equipment. As a result, the MoE has drafted an amendment to the Governmental Regulation on ODS and F-gases that required a company to report annually on ODS and F-gas quantities recovered, recycled and reclaimed. The MoE also planned to establish a database to record all users of ODS and F-gases that have equipment that contains more than 3 kg, as such equipment is subject to mandatory annual inspection.

8.4.6.5.1.4 Total ozone-depleting substances recovered

1177. The quantities of CFC-12, HCFC-22, carbon tetrachloride and methyl bromide that were recovered and recycled from 2003 to 2006 are shown in Table 38. In some cases, more CFCs appeared to be recycled than recovered in the same year, which was explained by the NOU as being due to the use of stocks that had been stored from previous years and that were not shown in the Table 38.

Table 38: Ozone depleting substances recovered and recycled in Estonia from 2003 until 2006 (kg)

Ozone-depleting substance	2003		2004		2005		2006	
	Re-covered	Re-cycled	Re-covered	Re-cycled	Re-covered	Re-cycled	Re-covered	Re-cycled
CFC-12	474	474	9*	127	114	0	13	0
HCFC-22	2320	2320	2431	9	2838	2838	5240	4356
Carbon tetra-chloride	300	0	0	0	15	0	0	0
Methyl bromide	0	0	0	0	30	0	0	0

* Last year of project when owners reported less recovered but more recycled from stocks

1178. In general, the results showed that less CFCs were recovered and recycled than HCFCs, probably because CFC equipment had been replaced with HCFC (and HFC) equipment. In addition, the quantity of CFCs was less than expected as the NOU considered that the sub-project was implemented too late to capture the majority of them, as the peak of CFC use was several years before the start of the sub-project. There was a substantial decline in CFCs from 1995 to 1996 due to the bankruptcy of Ookean Ltd that owned a fleet of 20 large fishing vessels that contained refrigeration equipment that operated on CFCs, including 5 very large factory ships. There was no report of the CFCs from these ships being recovered, probably because there was no legal requirement or other restriction in place that would encourage recovery of these CFCs at that time.

1179. The subsequent rise in HCFCs in 2003 was due to small shops still using HCFC-22 (supermarkets had switched to R404a) and the retailers importing more HCFCs than usual because of uncertainties in supply when Estonia joined the EC in 2004. There were no refrigerants reclaimed or destroyed in Estonia during this period.

1180. The amount of ODS recovered per year was much less than the 13.4 ODP tonnes anticipated for Estonia. the quantity of CFCs was less than expected as the NOU considered that the sub-project was implemented too late to capture the majority of them, as the peak of CFC use was several years before the start of the sub-project (see paragraph 1178 above). It is also possible that the Project Document developed in 1999 overestimated the quantity of CFCs that could be recovered, which appears to be the case in most of the ODS recovery and recycling sub-projects evaluated.

1181. The quantity of ODS recovered, and the lateness of the implementation of this sub-project, were assessed as unsatisfactory.

8.4.6.5.2 Awareness about ODS, ODS substitute technology, and strengthening of institutional capacities for dealing with ODS phase-out

1182. The technicians in enterprises that received the equipment received training on its use, which was described in the sub-project on training above.

1183. The courses delivered to technicians included a section on the damage to the ozone layer caused by ODS, the actions taken by the Parties to the Montreal Protocol to reduce and phase out the consumption of ODS, and the substitutes that were being put in place in many countries including Estonia to replace ODS. In this way, technicians were provided with a more general overview of national and international actions to encourage the recovery of the ozone layer.

1184. Technicians may also have been aware of ozone depletion as a result of the awareness programme that targeted the general public and that was undertaken by the NOU using the media (print, radio and television).

1185. The NOU was working with the Statistical Board to ensure that ODS import and export statistics are accurately reported, as there had been problems in the past correlating imports on the basis of ODS licenses issued and other statistics that were being used by the Statistical Board. The NOU planned to ask the Statistical Board to base its information on the ODS licensed for import.

1186. As a result of the Institutional Strengthening sub-project, the capacity of the government to undertake, coordinate and monitor projects on ozone layer protection had improved (see Section 8.4.4 on "*Institutional Strengthening and Capacity Building in Estonia*" above). The infrastructure for training had also been strengthened by the legislation that required the training of technicians that handled ODS.

8.4.6.5.3 Authority / credibility, necessary to influence policy and decision-makers

1187. The NOU staff, Ministry staff and 46 enterprises were the main stakeholders engaged in this recovery and recycling sub-project. The government of Estonia implemented legislative restrictions on ODS in a timely manner; oversaw national workshops on best-practice ODS recovery and recycling; and encouraged the industry as a result of the training of technicians to recover and recycle ODS. This credibility was established by an NOU team that is well-qualified to carry out tasks on ODS recovery and recycling due to a combination of political, technical and administrative expertise.

8.4.6.6 Assessment of monitoring and evaluation systems

8.4.6.6.1 Monitoring and evaluation design

1188. The Project Document required the *NOU to keep records of the amounts of ODS recovered and presented for recycling by each service centre, and to recruit a National Consultant if necessary to assist in this task*. The national consultant *would set up a database to monitor information received from the enterprises* that received the recycling and recovery equipment *for a period of one year* [February 2001 to February 2002].

1189. *The national consultant would ensure that the operations for most effective use of the above equipment are attained. In particular monitoring will make sure that:*

- The recovery machines were distributed according to criteria for maximising the recovery of CFC;
- All the equipment was properly used, kept and maintained; and
- Proper records of the amounts of CFC recovered, recycled and reused were maintained.

1190. The transfer of ownership to the companies after the project *was subject to final evaluation of the activities carried out by the companies*. There was no elaboration in the monitoring requirements by UNDP of the methodology that would be employed to determine whether or not the ODS recovery and recycling equipment *was properly used, kept and maintained.*

8.4.6.6.2 Monitoring and evaluation plan implementation

1191. There was no evidence to show that the M&E plan had been implemented, as there were no documents indicating the criteria for distribution of the equipment, there was no database showing that the equipment had been properly used and maintained, and there were no records of the amounts of CFC recovered, recycled and reused for the period of the sub-project. The only data on recovered recycled ODS were for the period 2003 to 2006 (see paragraph 1177 above), and not for the period of the sub-project which was February 2001 to February 2002.

1192. Some countries such as Uzbekistan developed assessed the quantity of ODS recovered by

enterprises and distributed more equipment to those that had more technicians and who recovered more ODS. In addition, Uzbekistan re-distributed equipment to better performing companies who recovered and recycled more ODS, compared to those companies that were not performing well. Inherent in these procedures was regular reports from companies and analysis by the NOU of the results on a regular basis. There was no evidence of similar reports that had been received and analysed in Estonia.

1193. The monitoring and evaluation plan implementation by UNDP was therefore assessed as unsatisfactory.

8.4.6.6.3 Budgeting and Funding for monitoring and evaluation activities

1194. The national consultant was allocated a budget of $4,500 for the monitoring and evaluation activities. There was no report available of expenditure that would allow a determination of whether or not the budget was sufficient for one year of the monitoring and evaluation activities.

8.4.6.6.4 Long-term monitoring

1195. The Protocol requires reporting on consumption in ODS, which includes quantification of the amount of ODS imported into a country, exported from a country and produced in a country. Annual reporting is therefore required from producers, importers and exporters of controlled substances. The European Commission compiles data submitted by Member States on ODS in order to report data to the Montreal Protocol that is representative of ODS consumption in the European Community. In order to enable the European Commission to streamline the reporting procedures to comply with the Montreal Protocol and to avoid duplications in the process, destruction facilities are required to also report directly to the European Commission[174].

1196. To ensure compliance with reporting obligations under the Protocol and to improve their practical application, the Commission is empowered in Regulation (EC) 1005/2009 to modify the reporting requirements for Member States and companies. In view of the envisaged development of Internet-based reporting tools the Commission should, as appropriate, draft measures to adapt the reporting requirements as soon as the relevant reporting tools are in place[175].

1197. Undertakings operating refrigeration, air conditioning or heat pump equipment, or fire protection systems, are required to keep records on the quantity and type of controlled substances added and the quantity of ODS recovered during maintenance, servicing and final disposal of the equipment or system. They are also required to keep records of other relevant information, including the identification of the company or technician which performed the maintenance or servicing, and the dates and results of the leakage checks carried out. These records are required to be made available on request to the competent authority of a Member State and to the Commission[176].

1198. This contrast with the previous ODS Regulation (EC) 2037/2000 that required Member States to report annually on systems established to promote the recovery of used controlled substances, including the facilities available and the quantities of used ODS recovered, recycled, reclaimed or destroyed. However, despite the requirement that Member States do not have to report to the Commission annually, the fact that the reports need to be available on request would mean that in practice the companies will need to continue to report ODS recovered, recycled, reclaimed or destroyed.

1199. The prospects for long term monitoring in Estonia in response to the legislative requirements were therefore assessed as likely.

8.4.6.7 Assessment of processes that affected attainment of project results

8.4.6.7.1 Preparation and readiness

1200. The NOU was not notified of the arrival date of the RR equipment by UNDP, prior to its arrival in

[174] Preamble No 21 in Regulation (EC) No 1005/2009 on ODS
[175] Preamble No 21 in Regulation (EC) No 1005/2009 on ODS
[176] Article 23(3) of Regulation (EC) No 1005/2009 on ODS

January 2001. Consequently, the NOU staff had to arrange for temporary storage, and training of technicians, before the equipment was distributed to companies. The NOU would have preferred to have known the arrival date so that training could have been completed and companies identified in order to allocate the equipment in a timely manner. This was assessed as a failure in communication by UNDP, who was responsible for the procurement and import of the equipment, and for the notification of the NOU of the likely arrival time.

1201. Apart from this, the NOU was well-prepared for the project. Some of the training courses on how to use the equipment were undertaken immediately prior to the arrival and distribution of the recovery and recycling equipment. Estonia adopted legislation prior to the start of the recovery and recycling sub-project and during the term of the project. The legislation included a ban on the import of products that contained CFCs and halons in 1999[177]; procedures for licensing ODS in 1999; a ban on the import of CFCs and halons in 2002; and the development and implementation of the Ambient Air Protection Act[178] in 2004, which included requirements on ODS, labelling of ODS already categorised as waste, and penalties for infringements of the regulations related to ODS; establishment of a national reporting[179] system for recovered, recycled and reclaimed ODS; qualification requirements[180] for persons dealing with ODS.

8.4.6.7.2 Country commitment and motivation

1202. Estonia's was committed and motivated to reduce and phase out ODS, and as part of this process to recover and recycle ODS for use during the servicing equipment. Related to this project, Estonia had made arrangements for the training of technicians in best-practice management of ODS, and had prepared information to promote the adoption of ODS-free technology and methods. The equipment was distributed to the companies. Estonia itself paid for the development and installation of the Reclamation Centre.

8.4.6.7.3 Stakeholder involvement

1203. The key stakeholders that Estonia engaged in this project were the companies that were involved in operating the recovery and recycling equipment, and the training institutions that were responsible for delivering the technical training courses. The ENGOs were not engaged on this issue, despite an invitation from the NOU to attend meetings, probably because their resources were limited and there were other more pressing environmental issues.

8.4.6.7.4 Financial planning

1204. There were no documents available from UNDP such as the assessments that led to the final Certificate of Closure, and therefore it was not possible to assess the financial planning during the project.

1205. In general, both the MoE and the NOU participated in decisions related to the finances associated with sub-projects. The NOU determined and defined the financial needs and the Ministry reviewed the request and assigned the funds for the Project. Quarterly financial reports were prepared by the NOU and submitted to the Ministry. Financial auditing of NOU and MoE expenditure was undertaken annually by an independent auditor.

8.4.6.7.5 UNDP supervision and support

1206. A UNDP recovery and recycling expert conducted the training workshops in February 2001. The equipment was distributed to the companies after the workshop. There was no other reference to UNDP supervision and support in the documentation in the recovery and recycling programme, or mentioned in the interview of the NOU for this report.

8.4.6.7.6 Co-financing and project outcomes & sustainability

1207. There was no co-finance in this sub-project.

---

[177] Governmental Regulation No 146 of 6 May 1999

[178] RTL, 19.05.2004, 43, 298: Ambient Air Protection Act

[179] RTL, 29.11.2004, 80, 537: Requirements for Ozone Depleting Substances and reporting for ODS and F-gases

[180] RTL, 22.03.2005, 32, 446: Competence of Personnel Dealing with Installation, Operation and Decommissioning of Equipment Containing Ozone Depleting Substances and Fluorinated Gases

8.4.6.7.7 Project implementation delays and impact on project outcomes & sustainability

1208. The NOU considered that the sub-project was implemented too late to have a large impact on the recovery of CFCs. There was a substantial decline in CFCs from 1995 to 1996 due to the bankruptcy of Ookean Ltd that owned a fleet of 20 large fishing vessels that contained refrigeration equipment that operated on CFCs, including 5 very large factory ships. There was no report of the CFCs from these ships being recovered, probably because there was no requirement to recover these CFCs at that time.

1209. Despite the delays, the prospects for sustainable operation of the equipment for ODS other than CFCs were good. As described above, EU legislation was in place that required recovery and recycling of ODS and annual reports to the European Commission from Estonia after 1 May 2004. After this time, Estonia submitted reports annually. The latest legislation that came into effect from 1 January 2010 has changed such that Estonia is no longer obliged to report such data annually to the Commission, but it is nevertheless required to collect such data in case the Commission demands it.

1210. In addition to activities associated with ODS, Estonia is also required to bound by legislation to undertake specific activities related to fluorinated gases, many of them being replacements for ODS in air conditioning and refrigeration. These activities include monitoring and repairing leaks, training of technicians and recovery of these gases at the end of the life of the equipment. This programme is carried out in parallel to the programme on ODS, and is therefore supportive of it.

1211. For these reasons, the delays in implementation of the project were assessed as having little impact on the long term sustainability of the requirement to recover and recycle ODS.

8.4.6.8 Sub-project rating

EST/00/G31 - National programme for recovery and recycling of ODS refrigerants (UNDP/UNOPS)		
Criterion	**Evaluator's Summary Comments**	**Evaluator's Rating**
Attainment of project objectives and results Sub criteria (in yellow below)	See comments below	S
Effectiveness	ODS recovery was less than the 13.4 tonnes predicted, and there were no reports of recovery during the sub-project	S
Relevance	Avoiding emissions of ODS is consistent with minimising the detrimental effect of ODS on the ozone layer	S
Efficiency	The cost-effectiveness was 34-60% more costly than recovery and recycling sub-projects carried out in Latvia ($13.40) and Lithuania ($16.00)	S
Sustainability of Project outcomes (overall rating) Sub criteria (in yellow below)	See comments below	S
Financial	Estonia financed the establishment of a ODS Reclamation Centre, and undertook activities within budget to promote the recovery and recycling of ODS	S
Socio-Political	Adequate to promote the ongoing recovery and recycling activities	S
Institutional framework and governance	Strong management support by the NOU, useful legislative measures, and good working relationship between the MoE (policy) and the NOU (implementation)	HS
Environmental	A number of legislative measures on ODS and fluorinated gases create an environment that encourages sustained activities on ODS recovery and recycling	S
Achievement of outputs and activities		S
Monitoring and Evaluation (overall rating) Sub criteria (in yellow below)	See below	
M&E Design	Poorly conceived at the outset of the sub-project	MS
M&E Plan Implementation (use for adaptive management)	There was no evidence to show that the M&E plan had been implemented	MS
Budgeting and Funding for M&E activities	Budget was provided but no report of expenditure and deliverables as a result	MS
Catalytic Role	No categorisation required	
Preparation and readiness	The NOU was well-prepared for the project	S
Country commitment and motivation*	Estonia's was committed and motivated to reduce and phase out ODS as evidenced by the legislation in place that restricted ODS and that required training	HS
Stakeholders' involvement	The sub-project involved the relevant stakeholders and made use of the skills, experience and knowledge of key national and international organisations	S
Financial planning	Inadequate documentation from UNDP to	S

EST/00/G31 - National programme for recovery and recycling of ODS refrigerants (UNDP/UNOPS)		
Criterion	**Evaluator's Summary Comments**	**Evaluator's Rating**
	determine whether the expenditure was with budget; but adequate information to indicate satisfactory financial management by the NOU and MoE	
UNEP supervision and support**	UNDP expert conducted the workshop, but there was no other evidence in the documentation or from the NOU that suggested other support	S
Overall Rating		S

Highly Satisfactory (HS); Satisfactory (S); Moderately Satisfactory (MS); Moderately Unsatisfactory (MU); Unsatisfactory (U); Highly Unsatisfactory (HU);
*Motivation replaced TOR 'driveness'; **Support replaced TOR 'backshopping'

8.4.7 EST/00/G32 Regional halon management stockpile programme (UNDP/UNEP)

8.4.7.1 Introduction

1212. The "*Regional Halon Management Scheme*" sub-project aimed to establish a programme for the recovery and recycling of halon from fire fighting equipment in Estonia, Latvia and Lithuania. Recovered and recycled halon could be used in these countries to service and maintain fixed flooding fire protection systems and fire extinguishers, thereby reducing the reliance on imported halon. The sub-project included the provision of technical assistance to encourage owners of halon fire fighting systems in Estonia to install halon-free technology, and a survey of key market sectors in Estonia to create a database of halon owners.

1213. Estonia received equipment for recovering and recycling halon, as well as funding for training on its use which was described above. The sub-project intended to eliminate 29 ODP-tonnes per year of halon over a 30 month period.

1214. The sub-project was approved in July 2000 and the equipment was installed 12 months after approval. The budget allocated by UNDP for the equipment was $229,225, of which 153,285 was targeted for Estonia, $11,550 to each of Latvia and Lithuania, $8,360 was for international training sessions in other countries, and $25,000 was for consultancy fees. The project duration was anticipated to be 30 months (December 2002) but it was completed ahead of schedule in June 2002.

8.4.7.2 Attainment of objectives and planned results

8.4.7.2.1 Effectiveness

1215. The project was intended to replace their consumption of virgin halon with recycled chemicals in Estonia, Latvia and Lithuania, thereby eliminating the 29 ODP-tonnes per year.

1216. At the beginning of the project operation, a strategic reserve of 5 tonnes of halon 2402, 2 tonnes of halon 1301 and 2 tonnes of 1211 were to be collected, stored and made available to service member clients. Halon in excess of this strategic reserve could be exported to other Halon Management schemes in other countries after the approval of the ministries and/or authorities involved. It was anticipated that over the 2 years of the sub-project duration that halon with an alternative would be replaced, and that only critical uses i.e., those without an alternative, would remain installed and only these would have access to the strategic reserve.

1217. The activities of the halon programme were intended to cover the three Baltic States and to be extended in the future to some of the former Warsaw Pact countries. The Warsaw Pact countries were the former Soviet Union, Albania (until 1968), Bulgaria, Czechoslovakia (as the Czech Republic and Slovakia), East Germany (until 1990), Hungary, Poland and Romania. The Soviet Union consisted of Russia and surrounding countries that today make up Armenia, Azerbaijan, Belarus, Estonia, Georgia, Kazakhstan, Kyrgyzstan, Latvia, Lithuania, Moldova, Russia, Tajikistan, Turkmenistan, Ukraine, and Uzbekistan. It was anticipated that over time the Halon Management scheme in the Baltic States would be expanded to include halon activities in these former Warsaw Pact countries. This extension of activities, however, was beyond the scope of the sub-project.

1218. Equipment was installed and commissioned for halon recovery and recycling, including: Remtec

equipment was installed for the recovery and recycling of halon 1211, of halon 1301 (as 1211 but upgradable to 3101), and of halon 2402. The equipment was installed, tested and a technician trained to operate the equipment. Other equipment that was received included scales for weighing halon, halon storage containers, and spare parts for each machine. The halon users' survey was completed in June 2001 and as a result a database was established in August 2001 showing critical and non-critical users of halon in Estonia, Latvia and Lithuania. The room for the Halon Recycling Centre was modified in August 2001 to accommodate the equipment. In August 2001, a small laboratory was established for monitoring the quality of the halon, and it stored the water purification equipment, analytical balances, gas chromatograph (GC) and standards for the GC. Three workshops were undertaken on decommissioning of fixed and portable halon systems.

1219. There were three different types of courses delivered, according to the occupational requirements of the trainee:

- How to identify, select and design fire protection systems with halon alternatives. This workshop was delivered to fire protection officials, fire engineers and safety managers.
- How to install, certify and maintain such systems without running the risk of causing an accidental discharge of halon, and how to safely decommission halon. This workshop was delivered to technicians and servicing personnel in licensed companies.
- How to manage the recovery, storage and recycling of halon. This workshop was mainly for staff at the Halon Recovery Centre. The workshop was undertaken in collaboration with representatives from Latvia and Lithuania that were involved in halon recovery and recycling. The training courses were conducted in Russian as English was not widely spoken. A training facility was established at the Halon Recovery Centre, equipped with demonstration material and demonstration systems, in order to deliver workshops at a later date when required.

1220. The quantities of halon 2402, 1301 and 2001 recovered and recycled in Estonia from 2002 until 2008 are shown in Table 39.

Table 39: Halon recovered and recycled in Estonia from 2002 until 2008

Year	Halon 2402		Halon 1301		Halon 2001*	
	Recovered (kg)	Recycled (kg)	Recovered (kg)	Recycled (kg)	Recovered (kg)	Recycled (kg)
2002	1,200	1,200				
2003	445	445	1,777	375		
2004	2,472	1,777	2,219	2,219		
2005	1,338	1,320	80	80		
2006	1,182	1,182	201	201		
2007	1,857	800			100	
2008	442	142	627	627	810	
TOTAL	**8,936**	**6,866**	**2,774**	**3,502**	**910**	
2008 Latvia	1,139				421	

* Halon 2001 is C_2H_5Br or ethyl bromide (Drs David Catchpole and Dan Verdonik HTOC pers. comm. 28 May 2009); halon 2402 has an ODP of 6; halon 1301 has an ODP of 10; and halon 1211 has an ODP of 3

1221. There was no halon recovered in 2000 and 2001 from Estonia. The quantities of halon 2402 and 2001 sent by Latvia to the Estonian halon bank are shown in the last row of Table 39. So far, Lithuania has not sent any halon to the bank, as negotiations on the price for the halon failed.

1222. Over the 7 year period from 2002 to 2008, almost 56 ODP-tonnes of halon 2402 and halon 1301 were recovered in total. This averaged about 8 ODP-tonnes per year, which was only 28% of the target of 29 ODP-tonnes per year originally intended when the sub-project was designed.

1223. Since the completion of the sub-project in June 2002, Estonia has been active in recovering and exporting halon for critical uses. For example, two tonnes of reclaimed halon were exported to the Indian Navy in 2006, and there have since been requests from India for Estonia to supply more halon from local or other sources (such as Ukraine). There was no evidence that the ministries from the other Baltic States agreed to the export, according to a policy development

in the Project Document. In May 2009 at the time of the evaluation, the Centre had banked about 1t of halon 1301 and 1.5t of halon 2402, which was below the strategic reserve level but presumably sufficient to support the ongoing needs for halon.

1224. Some of the halon banked at the Reclamation Centre was obtained from ships. Determining the amount of halon on ships was problematic in the beginning because data on halon were not recorded by the Maritime Administration. The NOU surveyed ship owners and, as a result of the responses, estimated that the total halon on 463 ships was about 400 tonnes, but far less was in reality decommissioned and transported to the Halon Centre. Halon decommissioned from ships was transported to the Reclamation Centre, using a small truck with a crane (Figure 22). The ships sometimes had 'BF halon[181]' for fire protection which when deployed was life-threatening for personnel on board.

Figure 22: Halon decommissioned from ships using truck and small crane, with storage tanks in background. Halon Bank, Estonia.

1225. Eight Estonian-flagged ships were fined for not decommissioning halon, which has encouraged them and other ships to replace the halon with alternatives. There are 4-5 companies operating in Estonia that install non-halon alternatives on ships when they arrive at the port for a refit. As of May 2009, the NOU reported that there are no known ships flagged to Estonia that have halon on board, and only halon deemed as critical remains in aircraft and military equipment.

1226. The halon programme in Estonia was assessed overall as satisfactory; parts of the programme were assessed as highly satisfactory such as the installation of the equipment, the modification of the Halon Recovery Centre for this purpose, the financial support of the Estonian government toward the activities of the Centre, and the continued activities on halon after the project finished (see further discussion below). However, much less halon was recovered than was estimated to have been installed e.g. 400 tonnes estimated on ships, which resulted in an average of only 8 ODP-tonnes per year being recovered which was well below the intended recovery rate of 29 ODP-tonnes per year.

8.4.7.2.2 Relevance

1227. The most common halon in Estonia have ODPs of 6 for halon 2402 and 10 for halon 1301, which means that each kg collected is equivalent to 6 and 10 kg of CFCs respectively. Therefore, the project is highly relevant. Best-practice environmentally requires the replacement of halon by alternatives, and then the halon collected is stored in leak-proof facilities for national or international critical uses. Any halon in excess of the critical use requirements should be destroyed in order to avoid any further likelihood of ozone depletion.

1228. It appears that only a small percentage of the halon estimated to be present in Estonia on land and ships was collected, which suggested the bulk of it was released when it was replaced by an alternative. Regulation (EC) 2037/2000, which influenced policies in Estonia on halon decommissioning and recovery during and immediately after the project, required non-critical halon to be decommissioned, recovered and not emitted to the atmosphere.

1229. More generally, the recovery of halon in the Estonia and Lithuania was also consistent with the objectives of the Vienna Convention and the Montreal Protocol, which *requires Parties to take appropriate measures in accordance with the provisions of this Convention and of those Protocols in force to which they are party to protect human health and the environment against adverse effects resulting or likely to result from human activities which modify or are likely to modify the ozone layer*[182].

[181] BF-2 was reported to be 37% halon 2402 and 63% methyl bromide, the latter being a gas which is highly toxic

[182] Handbook for the Vienna Convention for the Protection of the Ozone Layer - 7th Edition (2006). Article 2: General Obligations.

1230. The GEF established in 1995 an Ozone Layer Depletion Focal Area in response to the Montreal Protocol. The Focal Area has the strategic objective of protecting human health and the environment by assisting countries to phase out their consumption and production of ODS, to prevent emissions of ODS, and to encourage the uptake of alternative technologies and practices according to a country's commitments under the Montreal Protocol. The financial interventions in the GEF Focal Area contribute to the return of the ozone layer to pre-1980 ozone levels, which is expected by 2065.

1231. The work by Estonia on halon recovery and recycling was assessed as relevant for the protection of the ozone layer, but not all the halon was recovered that was estimated to have been installed in Estonia on land on or ships. The environmental benefit of the recovery was therefore undermined by emissions of halon, despite the good intentions of the government in supporting this sub-project.

8.4.7.2.3 Efficiency

1232. The cost-effectiveness was originally calculated in the Project Document as $6.39 / ODP-kg, based on the budget of $185,185 and a phase out target of 29,000 OPD-kg per year. For an unknown reason, the budget for the cost-effectiveness calculation in the Project Document was a lower value than the total project cost of $210,245.

1233. However, as 8,000 ODP-kg per year were phased on average over 7 years, the cost-effectiveness was about four times higher ($26.28 ODP-kg per year) than originally calculated in the Project Document.

1234. The cost-effectiveness of halon recovery and recycling programmes in three developing countries was $3.67 OPD-kg (China), $1.25 OPD-kg (India) and $0.80 OPD-kg (Malaysia)[183]. The cost-effectiveness of the halon recovery and recycling programme in Estonia was about 6 times more than the most expensive MLF-funded project that took place in China.

8.4.7.3 Assessment of sustainability of project outcomes

8.4.7.3.1 Financial resources

1235. The halon users survey cost was $5,000, the database $6,500 and the modifications to the building for the installation of the equipment was $30,000. The remaining $143,685 was expended on equipment which was purchased in December 2000 and delivered in August 2001.

1236. The Halon Recovery Centre is funded each year after the project was completed from the State budget. The requirement to recovery and recycle halon for critical uses was incorporated into the Estonian Environmental Action Plan. This Centre also enabled Estonia to implement Article 15 of Regulation (EC) 2037/2000, which required Member States to *take steps to promote the recovery, recycling, reclamation and destruction of controlled substances and shall assign to users, refrigeration technicians or other appropriate bodies responsibility for ensuring compliance*. Under the same legislation, Estonia was also required report to the Commission by 31December each year on *the systems established to promote the recovery of used controlled substances, including the facilities available and the quantities of used controlled substances recovered, recycled, reclaimed or destroyed*.

1237. The prospects for continued operation of the Halon Recovery Centre was assessed as likely, mainly as a result of funds being provided annually from the State budget for its operations, and because its activities were included in the Estonian Environmental Action Plan.

8.4.7.3.2 Socio-political

1238. Table 39 shows that most of the halon has been recovered from Estonia very little from Lithuania and none from Latvia. In addition, when the project in Estonia was completed there were no reports of any expansion (which was the original intention) of the sub-project to include halon recovery/recycling operations in 20 other countries that were former members of the Warsaw Pact and that were listed in paragraph 1217 above. Many of these countries have their own halon programmes which reduced the prospects of any cooperation with Estonia.

1239. We assessed the work on the recovery and recycling of halon as satisfactory for Estonian

183 MLF. 2003. Final report of the evaluation of the halon sector. UNEP/OzL.Pro/ExCom/40/8

decommissioned halon, but unsatisfactory as a halon bank for the Baltic countries which was its original intention. In fact, very little halon has been transferred from Latvia and none from Lithuania, possibly for commercial or socio-political reasons.

8.4.7.3.3 Institutional framework and governance

1240. The NOU implements MoE policies related to the recovery, recycling and storage of halon. There are four key Ministries that play a key role in relation to environmental projects: the Ministry of Social Affairs; Ministry of Finance, Ministry of Economic Affairs and the Ministry of Environment. The Ministry of Social Affairs manages the use of chemicals and their products for public health protection, and has the primary role of liaison with industry and industry associations. The Ministry of Finance retains Customs (the focus and supporting rationale being tax collection). The Ministry of Economic Affairs has responsibility for ships (transport) and communications. The Moe is responsible for air pollution and other emissions (climate change and ODS).

1241. There are four business lines in the Ministry of Environment: Finance and Administration; International Environmental relations (MEAs); Environmental management; and Nature conservation. The ODS programme involves senior staff in the MoE as the Deputy Minister opened the recovery and recycling workshops. The NOU also collaborated with the Estonian Rescue Board, the Ministry of Defence, the Ministry of Internal Affairs, the Ministry of Education and Science, the Plant Protection Inspectorate, the Civil Aviation Administration, the Estonian Maritime Administration, and the Railway Administration. There is a Steering Committee for the NOU and three Commissions that advise the MoE, which are composed of representatives of the private sector, industry associations and NGOs.

1242. The NOU operated a transparent operations and good halon accountability that demonstrated its proficiency in managing the recovery, recycling and storage of halon. The Institutional framework and governance in Estonia for the recovery, recycling and storage of halon was therefore assessed as satisfactory and sufficient to ensure the ongoing activities of this programme after the sub-project was completed.

8.4.7.3.4 Environmental

1243. There are a number of legislative measures that became applicable in the EU from 1 January 2010 that, when implemented and enforced, will improve the protection of the ozone layer in Europe. Many of them are extensions of the requirements that were present in earlier ODS legislation that was operative from 1 October 1999 until 31 December 2009 and which was operative during the term of this ODS recovery and recycling sub-project.

1244. Under Regulation (EC) No 2037/2000 the production and placing on the market of ODS including halon was prohibited. Subsequently, Regulation (EC) No 1005/2009:

- Permitted halon to be placed on the market and stored only by undertakings authorised by the competent authority;
- Allowed only halon that was categorised as a critical use and listed in an Annex to the Regulation to be stored;
- Required the European Commission to review this Annex of critical halon uses and, if appropriate, to adopt modifications and a time schedule for the phasing out the critical uses, taking into account the availability of technically and economically feasible alternatives or technologies that are acceptable from the standpoint of environment and health;
- Required Member States by 30 June each year to report to the European Commission on the quantity of halon installed, used and stored for critical uses, the measures taken to reduce emissions and an estimate of such emissions, and progress in evaluating and using adequate alternatives.

1245. The strengthening of environmental legislation in the EU that mandates additional activities on halon recovery, storage, reporting, import/ export were assessed as adequate to ensure the ongoing activities of the halon recovery and recycling programme in Estonia after this sub-project was completed.

8.4.7.4 Catalytic role

1246. The key factors influencing catalytic action are *innovation, demonstration, replication and cooperation*. Often a single sub-project was a combination of each of these factors. Government policies, measures and action had a significant impact on the speed and extent of catalytic action. The private sector's involvement in projects and co-financing are crucial, as they have a demonstration and replication role as well as an impact on supplier companies supply funded enterprises with raw materials.

1247. This sub-project showed two factors that influence catalytic action: *demonstration and cooperation*. Estonia *demonstrated* the feasibility of halon recovery and recycling, thereby encouraging Lithuania to send recovered halon for storage. Estonia also cooperated with both Latvia and Lithuania to encourage the recovery of halon. The catalytic effect had an impact in Lithuania, but there was no evidence of an impact in Latvia.

8.4.7.5 Achievement of outputs and activities

8.4.7.5.1 Delivered outputs

1248. A range of specialised equipment was obtained and installed for the recovery and recycling of halon 1211, 1301 and 2402 (see paragraph 1218 above for further detail). The equipment was installed, tested and a technician trained to operate the equipment. The equipment was installed into facilities that were specifically modified for this purpose. A survey on the uses of halon in Estonia was completed, and the information was entered was into a database for further analysis and action. A small laboratory was established for monitoring the quality of the halon. Three workshops were undertaken on decommissioning of fixed and portable halon systems. The quality of the work was to a high standard and timely. The project was completed about 20% faster than originally anticipated. The delivered outputs were assessed as highly satisfactory.

1249. The Reclamation Centre also received a Gramkow reclamation unit for HCFCs that was purchased instead of spare parts for the halon equipment. The machine was unused at the time of the evaluation and training is required on its use. The Centre planned to use the machine for the recovery and reclamation of HCFCs for use in Estonia, as from 1 January 2010 the use of virgin HCFCs will become illegal in the EU for topping up equipment that operates on HCFCs.

1250. As a result of the equipment installed in the Halon Recovery Centre and the database of halon, on average about 8 ODP-tonnes of halon were recovered, recycled and stored annually. The vast majority of the halon originated from Estonia. Minor amounts of halon were obtained from Lithuania and none from Latvia. Some halon was exported from Estonia to other countries for critical uses, such as India. In general, the amount of halon recovered and recycled annually was about 30% of the amount originally targeted in the sub-project. The amount of halon obtainable from the Baltic States may have been overestimated originally, which was characteristic of many of the ODS recovery and recycling projects carried out in countries. The quantity of ODS recovered from the Baltic States was therefore assessed as unsatisfactory.

8.4.7.5.2 Awareness about ODS, ODS substitute technology, and strengthening of institutional capacities for dealing with ODS phase-out

1251. On 30 May 2002, a halon workshop was conducted at the Radisson SAS conference Centre in Tallinn on halons and halon replacements. Dr Barbara Polak (UNDP consultant) and Garry Granny (Dascem Holdings Australia) were the experts that provided information to participants. There were 25 participants from fire fighting companies and the Marine Rescue Board. The information discussed during the workshop was distributed on CDs.

1252. In addition to the seminar, a training workshop for technicians operating the halon recycling and gas chromatograph equipment took place on 27-29 May 2002 at the Halon Recovery Centre. Eight people participated in this workshop.

1253. The workshops included a information on the damage to the ozone layer caused by halon, the actions taken by the Parties to the Montreal Protocol that had banned the production of halon in developed countries, action to reduce and phase out the use of halon, and the substitutes that were being put in place in many countries including Estonia to replace halon. In this way,

technicians were provided with a more general overview of national and international actions to encourage the recovery of the ozone layer. Technicians may also have been aware of ozone depletion as a result of the awareness programme that targeted the general public and that was undertaken by the NOU using the media (print, radio and television). The media campaign in 2001 and 2002 included 8 press releases, 4 newspaper articles, 3 radio interviews and 5 televised interviews.

1254. Estonia's work on halon that raised awareness about halon and halon substitutes in the context of the workshops was assessed as highly satisfactory.

8.4.7.5.3 Authority / credibility, necessary to influence policy and decision-makers

1255. The institutional framework and governance of the four key ministries, and the four business areas in the MoE, were described in paragraphs 1160 and 1161.

1256. The government of Estonia implemented legislative restrictions on ODS including halon in a timely manner; oversaw the delivery of national workshops on halon recovery and recycling; and encouraged the halon to be recovered, stored and recycled for critical uses. The NOU and the MoE had the authority and credibility to put in place activities that encouraged other stakeholders to recover, store and recycle halon. Their authority and credibility was based on a combination of political, technical and administrative expertise which influenced policy and decision makers in the government.

8.4.7.6 Assessment of monitoring and evaluation systems

8.4.7.6.1 Monitoring and evaluation design

1257. The Project Document in 1999 referred to the establishment of a Steering Committee consisting of representatives from the NOUs and the national subcontractors of the three countries. The Steering Committee was required to develop and agree operating policies for the Halon Recovery Centre. There was no requirement for the Steering Committee to monitor and report on the progress on the implementation of this sub-project.

1258. There was no other evidence in the UNDP Project Document of any other monitoring and evaluation plan.

8.4.7.6.2 Monitoring and evaluation plan implementation

1259. As there was no design for M&E, there was no monitoring of the M&E plan.

8.4.7.6.3 Budgeting and Funding for monitoring and evaluation activities

1260. Although funds had been allocated in the budget for national sub-contractors, there was no evidence of a requirement for monitoring and evaluation as part of their responsibilities.

1261. The M&E activities established by UNDP that were intended to be carried out during the sub-project were entirely missing and for this reason the M&E activities were assessed as unsatisfactory. The only evidence available of any kind of monitoring was the Certificate of Completion that was issued on 7 June 2002 after the completion of the project.

8.4.7.6.4 Long-term monitoring

1262. Regulation (EC) 2037/2000 that was in force from 1 October 1999 until 31 December 2009 required Member States to report annually on systems established to promote the recovery of used controlled substances such as halon, including the facilities available and the quantities of used ODS recovered, recycled, reclaimed or destroyed. Estonia was subject to this regulation from 1 May 2004 when Estonia joined the EU. However, in reality Estonia followed EC legislation on halon before joining the EU as part of the process of legislative harmonisation with the EU.

1263. Regulation (EC) 1005/2009 that came into force on 1 January 2010 requires Member States by 30 June each year to report to the European Commission on the quantity of halon installed, used and stored for critical uses, the measures taken to reduce emissions and an estimate of such emissions, and progress in evaluating and using adequate alternatives.

1264. In addition to national and regional reporting requirements, the Montreal Protocol requires reporting on trade in ODS. Annual reporting is therefore required from producers, importers and exporters of controlled substances. These reports submitted by the Baltic Countries to the

Ozone Secretariat should continue to show zero halon consumption since virgin halon is not produced, imported or exported.

1265. The environmental legislation in the EU that mandated activities by Member States and companies on halon recovery, storage, reporting, import/ export during and after the sub-project were assessed as adequate to ensure that monitoring activities on halon continued after this sub-project was completed.

8.4.7.7 Assessment of processes that affected attainment of project results

8.4.7.7.1 Preparation and readiness

1266. Legislation was introduced that banned the import of products that contained CFCs and halons in 1999[184]; introduced procedures for licensing ODS in 1999; the import of CFCs and halons was banned in 2002; the Ambient Air Protection Act[185] was developed and implemented, which included requirements on ODS, labelling of ODS already categorised as waste, and penalties for infringements of the regulations related to ODS; establishment of a national reporting[186] system for recovered, recycled and reclaimed ODS; qualification requirements[187] for persons dealing with ODS and F-gases; and a procedure for keeping log books[188] on equipment containing ODS and F-gases. An ODS licensing system and quotas was also introduced for HCFCs. Some legislation was drafted in 1999 in anticipation of Estonia's accession to the EU in 2004. When it was implemented after accession, Estonian legislation on the same topic was no longer necessary and became invalid.

1267. The driver for legislation in Estonia on ODS from 2002 onwards was Regulation (EC) No 2037/2000, which came into force in the EU on 30 June 2000, as Estonia acceded to the EU on 1 May 2004. Two years prior to accession to the EU and thereafter, members from the NOU and the MoE regularly attended meetings in Brussels related to improvements in the implementation of regulations on ODS. They also attended meetings of the Nordic-Baltic network to discuss a range of ODS-related issues, and engaged in Twinning Project with Germany on modifications that are needed to the ODS legislation to allow control of F-gases.

1268. As a result of EU membership, the European Commission requires the Estonian government to submit annual reports on emissions control of ODS (minimum qualification requirements), the use of MB and alternatives, critical uses of halons, the use of CFCs in medical products that control asthma, the phase out of halon on ships and in aircraft, and the quantity of ODS recovered, reclaimed, recycled and destroyed. The process of report preparation by the NOU resulted in a requirement for Customs to modify their checking procedures.

1269. Apart from these activities on ODS legislation, Estonia was also prepared to receive the equipment for halon recovery and recycling. The building that was to become the Halon Recovery Centre was modified allowing the equipment to be installed on arrival. The equipment installation and training of personnel were also completed ahead of schedule.

1270. Due to these legislative activities and the 'physical' preparation by Estonia, this country's preparation and readiness for this sub-project on halon was assessed as highly satisfactory.

8.4.7.7.2 Country commitment and motivation

1271. There were a range of activities undertaken by Estonia that showed a strong commitment and motivation to reduce and phase out halon. The MoE put in place legislation to prevent halon imports; the NOU made arrangements for the training of technicians in three different courses according to their professional requirements for training; the NOU prepared information to describe the environmental damage caused by halon and to promote the adoption of halon-free technology and methods. The equipment for the collection storage, and recycling of halon was installed in specialised facilities. Estonia paid for the development and installation of the Reclamation Centre, not the sub-project. When the project had been completed, the NOU

---

[184] Governmental Regulation No 146 of 6 May 1999

[185] RTL, 19.05.2004, 43, 298: Ambient Air Protection Act

[186] RTL, 29.11.2004, 80, 537: Requirements for Ozone Depleting Substances and reporting for ODS and F-gases

[187] RTL, 22.03.2005, 32, 446: Competence of Personnel Dealing with Installation, Operation and Decommissioning of Equipment Containing Ozone Depleting Substances and Fluorinated Gases

[188] RTL, 29.11.2005, 114, 1755: Procedure and format for Keeping Logbooks on Equipment containing Ozone Depleting Substances and Fluorinated Greenhouse Gases

worked with relevant ministries to have the halon on ships decommissioned and replaced with halon free systems. Ships that continued to use halon were penalised. Halon was decommissioned from large facilities such as the TV tower (more than 1 tonne of halon) and replaced with halon-free alternatives.

8.4.7.7.3 Stakeholder involvement

1272. The key stakeholders that Estonia involved in this project were those companies and organisations that were identified from the survey as owners of halon; companies that were responsible for selling fire fighting equipment including halon-free systems; and companies that decommissioned halon. As an example, the TV Tower in Tallinn is owned by AS Levira and contained 1,820 kg of halon 2402. The system was maintained by OÜ TESA Spetsautomaatika which had experience with the operation of fire fighting systems in the National Library and the Central History Museum in Tallinn. OÜ Kuvasec Mereteen was the company that was employed by AS Levira to decommission the halon and to replace it with NOVEC 1230.

1273. The NOU maintained contacts with other stakeholders in Estonia and to some extent in Latvia and Lithuania including the Ministries of Environment in Estonia, Latvia, Lithuania; the Estonian Rescue Board; the Estonian Management Institute; the Estonian Maritime Academy; the Fire Department Authority in Latvia; and the Fire Department in Lithuania.

8.4.7.7.4 Financial planning

1274. There were no documents available from UNDP such as the assessments that led to the final Certificate of Closure, and therefore it was not possible to assess the financial planning during the project.

1275. In general, both the MoE and the NOU participated in decisions related to the finances associated with sub-projects. The NOU determined and defined the financial needs and the Ministry reviewed the request and assigned the funds for the Project. Quarterly financial reports were prepared by the NOU and submitted to the Ministry. Financial auditing of NOU and MoE expenditure was undertaken annually by an independent auditor.

8.4.7.7.5 UNDP supervision and support

1276. UNDP consultants Ms Barbara Polak (UNDP consultant) and Mr Garry Granny (Dascem Holdings Australia) led the discussions at the workshop on halon recovery and recycling on 30 May 2002. UNDP was responsible for procuring the equipment and arranging for it to be delivered to Estonia. Bearing in mind that the project ended in June 2002, there was no other evidence of support by UNDP during this project.

1277. As the there was a high level of professional expertise and competency within the NOU and MoE, there was not the requirement for close supervision in this sub-project.

8.4.7.7.6 Co-financing and project outcomes & sustainability

1278. There was no declaration of co-finance in the sub-project in the beginning. However, during the sub-project Estonia co-financed the modifications to the building that was later to be used as the Halon Recovery Centre. The amount of co-finance for this activity was not defined.

1279. The activities associated with halon recovery and recycling continued to be funded from the State budget after the sub-project concluded. Estonia regards these activities as essential for contributing towards its compliance and reporting requirements for ODS and halon in particular, and therefore regards the funds from the State budget as necessary for these purposes. The combination of legislative requirements and budget availability promoted the sustainability of halon recovery and recycling in Estonia.

8.4.7.7.7 Project implementation delays and impact on project outcomes & sustainability

1280. The project was completed several months earlier than anticipated in the Project Document. As there was no delay, there was no impact on project outcomes & sustainability.

8.4.7.8 Sub-project rating

EST/00/G32 – Regional halon management stockpile programme (UNDP/UNEP)

Criterion	Evaluator's Summary Comments	Evaluator's Rating
Attainment of project objectives and results Sub criteria (in yellow below)	See comments below	HS
Effectiveness	HS for the installation of the equipment, establishment of the Centre, and continuation of activities afterwards; but S for the overall quantity of halon recovered from the Baltic region	HS/S
Relevance	Halon recovered was much less than halon that was estimated to be installed on land facilities and marine vessels	S
Efficiency	Relatively expensive compared with MLF-funded projects in developing countries	S
Sustainability of Project outcomes (overall rating). Sub criteria (in yellow below)	See comments below	S
Financial	Efficient use of funds as well as co-finance during the project; funded from State budget when the project was completed	HS
Socio-Political	S for Estonia where most of the halon was recovered; but US for the operation of the bank as a regional resource as no halon was obtained from Latvia and some from Lithuania	S/US
Institutional framework and governance	Transparent operations and good halon accountability, but not all the halon installed was recoverable	S
Environmental	EU legislation is the major driver for decommissioning non-critical uses, recovering and storing halon, avoiding emissions and reporting on quantities installed and recovered.	HS
Achievement of outputs and activities	HS for Estonia but US for the Baltic Region as the hard work to recover halon was not reflected in the overall amount recovered	HS/US
Monitoring and Evaluation (overall rating) Sub criteria (in yellow below)	See below	
M&E Design	No evidence of a UNDP plan	US
M&E Plan Implementation (use for adaptive management)	No plan and no implementation	US
Budgeting and Funding for M&E activities	Consultancy budget was not used for M&E	US

EST/00/G32 – Regional halon management stockpile programme (UNDP/UNEP)		
Criterion	**Evaluator's Summary Comments**	**Evaluator's Rating**
Catalytic Role	No categorisation required	
Preparation and readiness	Legislation in place, equipment arrived on time, workshops completed and the project completed several months early	HS
Country commitment and motivation*	Estonia was highly committed to and motivated to reducing and phasing out halon, both during and after the project	HS
Stakeholders' involvement	Range of relevant stakeholders involved	HS
Financial planning	Satisfactory as equipment was imported and paid on time, and the building modifications to house the equipment were financed and completed on time	HS
UNEP supervision and support**	UNDP/UNOPs supervision and support was not evident except when consultants visited Estonia to participate in the workshops, which was at the end of the project	US
Overall Rating		S

Highly Satisfactory (HS); Satisfactory (S); Moderately Satisfactory (MS); Moderately Unsatisfactory (MU); Unsatisfactory (U); Highly Unsatisfactory (HU);
*Motivation replaced TOR '*driveness*'; **Support replaced TOR 'backshopping'

5 Hungary

8.5.1 Background

1281. About 5 years before the start of the GEF Project in 1995, Hungary had implemented a range of market reforms that aimed to stimulate a stagnant economy. These reforms included price and trade liberation measures, a new tax system and a market-based banking system[189]. There was a substantial decline in living standards from 1990 to 1994, due to government overspending and insufficient privatization of companies. Hungary's net foreign debt rose significantly in 1993, due largely to consumer subsidies and unprofitable state enterprises. However, toward the end of the 1990's, the living standards had improved due mainly to Hungary's trade with Europe. This closer relationship with Europe helped to pave the way for Hungary's accession to the EU in 2004.

1282. The consumption of ODS was reflected in the strength or weakness of the economy. There was a 45% reduction in ODS consumption due to the economic recession in the early to mid-1990's[190]. Hungary estimated that 35-45% of the ODS was phased out by enterprises using their own resources. The GEF Project was therefore used to phase out 15-20% of the remaining ODS in Hungary at that time.

1283. Prior the start of the ODS phase out projects, Hungary had acceded to the Vienna Convention in 1988 and the Montreal Protocol in 1989. Later Hungary approved the London Amendment in 1993 and acceded to the Copenhagen Amendment in 1994. As a Party to the Montreal Protocol, Hungary was required to comply with the control schedule in the Montreal Protocol which, *inter alia*, required developed countries to phase out the consumption of halon on 1 January 1994; and to phase out CFCs, methyl chloroform and carbon tetrachloride on 1 January 1996.

1284. Although Hungary continued to consume ODS from 1997 to 2002 that should have been phased out in 1996, it remained in compliance with its control obligations by having recourse to an Essential Use exemption that was authorised by the Parties from 1996 to the end of 2003. The exemption was granted by the Parties in response to Hungary's request, and permitted the consumption of CFCs after 1 January 1996. Hungary's maximum Essential Use Exemption in any one year during this period was 10.1 ODP-tonnes, while for the same period of time consumption did not exceed 3.9 ODP-tonnes in any year. Hungary's reported consumption for all other ODS for the same period was zero, apart from HCFCs and methyl bromide for which consumption was permitted.

1285. The phase out of a range of ozone-depleting substances in Hungary and other countries has been reported recently[191]. The phase out of methyl bromide occurred later than the CFCs as a result of efforts carried out in two regional projects to replace methyl bromide with alternatives. The evaluation in this report concerns the phase out of methyl bromide in Hungary, according to the work undertaken in the UNDP/UNEP project entitled "*Total Sector Methyl Bromide Phase Out in Countries with Economies in Transition*".

8.5.2 Projects on methyl bromide

1286. The GEF initially funded a UNEP Project entitled "*Initiating early phase out of methyl bromide in*

---

189 US State Department. Hungary background note.

190 Ministry for Environment. 1998. Phaseout of ozone depleting substances in Hungary. Account on the Country Programme and on the World Bank-GEF Project for Phaseout of ODS. 76pp.

191 Batchelor, T.A., Smirnov, V. and LA Risby. 2009. Impact Evaluation of the Phase Out of Ozone-Depleting Substances in Countries with Economies in Transition. *Volume 1: Theory of Change*. 181 pp. *Volume 2: Country Reports*. 271 pp. Report to the Global Environment Facility Evaluation Office. 7 August 2009.

CEITs through awareness raising, policy development and demonstration/training activities". This was a Medium-Sized Project (MSP) that was designed to assist seven CEITs to reduce their use of methyl bromide[192]. The Project commenced in March 2000 and concluded in September 2002. The total budget was $806,195 consisting of $700,000 from GEF, $37,000 in kind from the government, and $106,195 from Canada. This project is not subject to evaluation in this report, but was a forerunner to a later UNDP/UNEP Regional Project which is the subject of this evaluation.

1287. The Project "*Initiating early phase out of methyl bromide in CEITs through awareness raising, policy development and demonstration/training activities*" consisted mainly of awareness raising activities on the uses of methyl bromide and its alternatives, policy development for methyl bromide phase out, identification of alternatives, diffusion of demonstration results, adoption of alternatives, and implementation of national programmes. Workshops were held in Hungary (23-25 April 2001, soil uses) and Bulgaria (28-30 May 2002, postharvest uses). The project assisted Bulgaria to complete a range of activities toward the reduction and phase out of methyl bromide, including the publication by the NOU in both English and Bulgarian of a booklet entitled "*Without MB –but how?*", which was based on material translated from UNEP publications; publication of methyl bromide Consumption figures and presentations from the national awareness meeting held in Plovdiv (2001); and a video on the topic of methyl bromide and radio commentary were broadcast. The Extension Service provided seminars on alternatives to methyl bromide in grapes and vegetable production. Bulgaria surveyed the rural population to determine their awareness of the need to phase out methyl bromide. The project encouraged Bulgaria to expand the use of solarisation to control soil pests, which it had initiated in 1999.

1288. The workshops held in Hungary and Bulgaria concluded, in part, that further investment was needed to implement methyl bromide alternatives for to control pests in soil and durable commodities, and possibly for structural fumigation. The workshops also identified a need for non-investment activity such as training in the implementation of policies and measures to limit the use of methyl bromide and to expand the use of alternatives, to support and sustain training on the use, and the development of, alternative techniques.

1289. This project laid the foundation for further work in the UNDP/UNEP "*Total Sector Methyl Bromide Phase Out in Countries with Economies in Transition*" that completed the phase out of the Non-QPS uses of methyl bromide. The results of this Project are evaluated in this Evaluation Report.

8.5.3 GF/4040-05-05 "Total Sector Methyl Bromide Phase Out in Countries with Economies in Transition"

8.5.3.1 Introduction

1290. The GEF also funded the UNDP/UNEP "*Total sector methyl bromide phase out in countries with economies in transition*" was designed to assist five[193] CEITs to phase out all uses of methyl bromide except quarantine and pre-shipment by 1 January 2005, in accordance with the text of the Copenhagen Amendment of the Montreal Protocol that was relevant to developed countries.

1291. The UNEP budget for the non-investment activities in the regional project was $4,203,754 including $130,500 for project development, $2,151,325 from the GEF and $1,921,929 of in-kind co-finance[194]. The UNDP budget for the investment activities in the regional project was $3,267,075 including $45,000 for project development, $2,848,675 from the GEF and expected in-kind contributions of $373,400[195]. The total budget for the project was therefore $7,470,829. The regional methyl bromide phase out project was scheduled to commence in May (UNEP) or December (UNDP) 2004 and to conclude in May 2006 (UNEP) or November 2007 (UNDP).

---

[192] GF/4040-00-10 for CEITs Bulgaria, Estonia, Hungary, Latvia, Lithuania, Poland and Slovakia.

[193] GF/4040-05-05 for CEITS Bulgaria, Estonia, Hungary, Latvia, Lithuania and Poland. Azerbaijan and Uzbekistan were observers. Estonia did not have any non-QPS methyl bromide uses.

[194] UNEP. 2008. UNEP GEF PIR FY 2008 Review 1. For the period 1 July 2007 to 30 June 2008. 50 pp

[195] UNDP. 2003. Total Sector Methyl Bromide Phase Out in Countries with Economies in Transition. GEF – UNDP Project Document. 29 pp.

1292. The Project commenced in Hungary on 31 December 2005[196] and was completed in Hungary on 30 June 2008. Actual costs totalled $691,086 which consisted of GEF $188,068 and co-finance (in-kind) of $503,018. In reality, Hungary had already achieved the objective of the Project when it officially commenced. Therefore, the project in Hungary was useful for consolidating the alternatives to methyl bromide that had been implemented to control soil pests, in order to stabilise the sustainability of the methyl bromide phase out.

8.5.3.2 Attainment of objectives and planned results

8.5.3.2.1 Effectiveness

1293. The project phased out methyl bromide through a combination of awareness raising activities, policy development assistance, training on alternatives and investment activities, and data collection activities to measure the impact of the project. According to UNEP[197], this included the following performance indicators:

- Provision of methyl bromide publications and materials (with provisions for translation into local languages) to support *awareness-raising* activities;
- Training workshops or modules on *policy development* for the control of methyl bromide (bringing together policy makers, Customs officers, importers, users, producers)
- *Training courses/workshops* to educate stakeholders on alternatives and to develop training strategies for local extension workers on promoting and implementing alternatives;
- *Investment activity* to implement suitable methyl bromide alternatives for control of pests in soil (pre-harvest) and durable commodities (post-harvest); and
- The phase out of non-QPS methyl bromide consumption[198].

1294. The achievement of outputs and activities by Bulgaria, as measured against these performance indicators, are provided in Section 8.5.3.5.1 "*Delivered outputs*" on page 291.

8.5.3.2.2 Relevance

8.5.3.2.2.1 Continued reduction of methyl bromide

1295. The five countries that had reported consumption of methyl bromide, and that were participants in the project "*Initiating early phase out of methyl bromide in CEITs through awareness raising, policy development and demonstration/training activities*", were reported to have reduced their combined consumption of methyl bromide from 120.42 ODP-tonnes at the start of the project to 86.16 ODP-tonnes in 2000.

1296. However, consumption reported in 2001 indicated that for some countries investment assistance was urgently needed to fully phase out methyl bromide. Bulgaria, the Czech Republic, Estonia, Hungary, Latvia, Lithuania, Poland, and Slovakia were the original participants in the project, with Bulgaria, Hungary, Latvia, Lithuania and Poland being responsible for the main consumption in the region. In 2001, three countries (Bulgaria, Latvia and Poland) showed signs of a return to increased consumption. The governments of these countries maintained that without further assistance they would be unable to completely phase out methyl bromide. Therefore the project was relevant for preventing an increase in methyl bromide and relevant for ending methyl bromide uses altogether.

1297. The project was relevant because the governments of these countries maintained that without further assistance they would be unable to completely phase out methyl bromide.

8.5.3.2.2.2 Avoidance of methyl bromide critical use requests

1298. Regulation (EC) No 2037/2000 on *Substances that Deplete the Ozone Layer* has more stringent criteria for determining 'critical use' exemptions than those contained in the Montreal

[196] Date Hungarian Sub-project was signed by Hungary. The Project was approved 1 May 2004, endorsed by CEO Nov 2004 and activities in the Project commenced in March 2005.

[197] UNEP. 2003. GEF PDF Block B Request: *Total Sector MB Phase Out in Countries with Economies in Transition*. Page 9. UNEP-DTIE internal publication. 41 pages.

[198] Included by the evaluators in this report as this was implied but not stated by UNEP.

Protocol[199]. In 2005, the EU licensed only modest critical use exemptions that were much less than those approved by the Montreal Protocol, in accordance with the criteria contained in Decision IX/6 of the Montreal Protocol.

1299. The project was relevant as it assisted the participating countries to deploy alternatives to avoid applications for 'critical uses'. The short time frame in the project required the transfer of proven methyl bromide alternatives from other regions with similar climates and conditions, and to adapt them to local conditions.

8.5.3.2.2.3 Compliance with market standards

1300. Farmers in Europe are experiencing market pressures to reduce the environmental impact of their farming practices. For example, European supermarket chains have established a code of practice for agricultural production for fruit and vegetables, called EurepGAP. EurepGAP is a private sector body that sets voluntary standards for the certification of agricultural products globally. These standards were developed in response to consumer concerns about food production standards, pesticides and environmental pollution from agriculture.

1301. Increasingly, the European supermarket chains are requiring farmers/suppliers to comply with these strict standards if they wish to continue supplying the supermarkets in future. The standards require suppliers/farmers to justify in writing the use of methyl bromide and other fumigants, and strongly promote integrated pest management (IPM) and non-chemical methods of controlling pests and diseases.

1302. The project was relevant because it helped to build capacity for the longer-term development of non-chemical alternatives that are suitable for the markets and circumstances in which they operate.

8.5.3.2.2.4 Compliance with the Montreal Protocol

1303. The GEF[200] stated that "*…In order to achieve compliance with the Montreal Protocol, a full phase out of all reported (non-QPS) consumption (and production) needs to be achieved by the end of 2004 … consumption needs to be reduced from the current levels … to zero in 2005*". Because methyl bromide was still being consumed in Hungary at the time the project was being formulated[201], Hungary was eligible for assistance to completely phase out methyl bromide.

1304. The Workshop on Methyl Bromide Alternatives for Soil Uses (April 2001, Hungary) concluded in part that the deployment of alternatives *"…may need extra financial investment, (with the further) support of the GEF, particularly where the establishment of soil-less production, registration of new biological agents or pesticides, or higher application costs of physical and cultivation costs are involved".*

1305. A similar conclusion was reached by working groups at the subsequent meeting in Bulgaria for training in post-harvest alternatives (May, 2002), where participants concluded in part that *"…Alternatives are present, but assistance is required for technology transfer and adaptation to the specific conditions, and to produce new alternatives as the existing ones are not always suitable to replace MB (under the conditions experienced in the CEITs of the Eastern European region)…".*

8.5.3.2.2.5 Compliance with the Montreal Protocol

1306. The reduction and phase out of methyl bromide in Hungary is also consistent with the objectives of the Vienna Convention and the Montreal Protocol, which *requires Parties to take appropriate measures in accordance with the provisions of this Convention and of those Protocols in force to which they are party to protect human health and the environment against adverse effects resulting or likely to result from human activities which modify or are likely to modify the ozone layer*[202].

1307. The GEF established in 1995 an Ozone Layer Depletion Focal Area in response to the Montreal

---

199 Regulation (EC) No 2037/2000. Article 3 (2)(iii).

200 GEF. 2003. GEF Support to Countries with Economies in Transition in Phasing Out of Annex C1 and E Substances of the Montreal Protocol GEF/C.18/Inf.6, page A4

201 Ozone Secretariat Data Centre. 2009. Hungary reported to the Parties of the Montreal Protocol a consumption of 9.5 ODP-tonnes of methyl bromide in 2003.

202 Handbook for the Vienna Convention for the Protection of the Ozone Layer - 7th Edition (2006). Article 2: General Obligations.

Protocol. The Focal Area has the strategic objective of protecting human health and the environment by assisting countries to phase out their consumption and production of ODS, to prevent emissions of ODS, and to encourage the uptake of alternative technologies and practices according to a country's commitments under the Montreal Protocol. The financial interventions in the GEF Focal Area contribute to the return of the ozone layer to pre-1980 ozone levels, which is expected by 2065.

1308. The reduction and phase out of methyl bromide was a requirement for developed countries such as Hungary that had ratified the Copenhagen Amendment in the Montreal Protocol. In addition, the reduction and phase out of methyl bromide was required by 31 December 2004 which was shortly after Hungary's accession to the EU on 1 May 2004. The sustained phased out of methyl bromide was therefore relevant for avoiding non-compliance with EU legislation on methyl bromide that applied shortly after accession.

1309. The actions taken by Hungary to phase out methyl bromide were therefore relevant to continuing the reductions in methyl bromide use that had been achieved in previous projects, compliance with market standards by implementing production practices that minimised the use of chemicals in the food chain, recommendations for reducing methyl bromide use, compliance with Montreal Protocol, and continuing to comply with EU regulations after accession to the EU.

8.5.3.2.3 Efficiency

1310. The cost-effectiveness as a means of determining '*efficiency*' was not relevant to the Institutional Strengthening component of this project (such as advice on the development of policies and measures), as Institutional Strengthening is not normally subject to cost-effectiveness criteria. The GEF/UNEP-UNDP non-investment in this regional project was $4,203,754.

1311. Hungary reported that the actual costs of the project totalled $691,086 which consisted of GEF $188,068 and co-finance (in-kind) of $503,018. In 2003 which was two years before the project commenced on 31 December 2005, Hungary reported a methyl bromide consumption of 9.5 ODP-tonnes[203]. Based on the GEF funding of $188,068 the cost-effectiveness of the project for sustaining the phase out of the methyl bromide was therefore $19.80 per ODP-kg. The methyl bromide baseline for Hungary in the Project Document was reported as 15.9 ODP-tonnes[204], which improved the cost-effectiveness to $11.89 per ODP-kg. This baseline was used at the time of the project formulation as Hungary had reported a methyl bromide consumption of 16.2 ODP-tonnes in 2002.

1312. UNDP estimated the cost-effectiveness to the GEF to be about $50 per ODP-kg for the investment component of the regional project, based on the phase out of about 100.2 ODP-tonnes of methyl bromide annually in the region of the participating countries[205].

1313. The cost-effectiveness reported by the MLF for the phase out of methyl bromide in 31 developing countries prior to 2003 ranged from $0.04 to $85.18 per ODP-kg, the price depending mainly on the size of the project and its location[206]. The average cost-effectiveness in 24 completed projects that were assessed by the MLF was $23.55 per ODP-kg of methyl bromide.

1314. The cost-effectiveness of $19.80 per ODP-kg based on the reported phase out of methyl bromide in Hungary was less than the average cost-effectiveness of $23.54 ODP-kg per year of MLF-financed methyl bromide phase out projects described above. The cost-effectiveness of $11.89 per ODP-kg, based on the reported phase out of methyl bromide in Hungary in 2004, was also about half as expensive as the average cost-effectiveness of MLF-funded methyl bromide phase out projects.

1315. The evaluation team considered the smaller target of 9.5 OPD-tonnes to be appropriate as this was the methyl bromide consumption officially reported by the NOU to the Ozone Secretariat, whereas the larger figure of 15.9 ODP-tonnes was an estimate made more than three years before the start of the project. The cost-effectiveness of the phase out project in Hungary was assessed as relatively inexpensive, compared with similar projects undertaken in developing countries.

---

[203] Ozone Secretariat Data Centre, 13 May 2009

[204] UNEP. 2008. UNEP GEF PIR FY 2008. Assessment of the status of the project by UNEP. Internal document.

[205] UNDP. 2003. Total Sector Methyl Bromide Phase Out in Countries with Economies in Transition. GEF – UNDP Project Document. 29 pp. Page 27.

[206] MLF. 2004. Desk Study on Methyl Bromide Projects. UNEP/OzL.Pro/ExCom/43/8. Annex V, pages 36-37.

8.5.3.3 Assessment of sustainability of project outcomes

8.5.3.3.1 Financial resources

1316. The phase out of methyl bromide was a core government objective in Hungary's environmental strategy. The institutional structure for the project consisted of a Project Coordination Unit (PCU) that was an independent company responsible for project management and administration. The National Ozone Unit (NOU) within the Ministry of Environment and Water (MEW) was the Executing Agency. A National Steering Committee (NSC) provided technical advice to PCU/MEW.

1317. The Regional Plant and Soil Protection Service (Ministry of Agriculture and Regional Development) and Corvinus University delivered the Train-the-Trainer (TTT) courses, assisted by two former methyl bromide fumigation companies (Zephyr and Arpad). Kecskemet College monitored and evaluated (M&E) the training. FAO provided training expertise for the Farmer Field Schools (FFS) together with organiser Agro-Mester Ltd. Specialised equipment training was delivered by Imants who provided the rotary spader equipment.

1318. After 1 May 2004 when Hungary acceded to the EU, as a new Member State Hungary had access to funds to progress Hungary's political and economic transition in areas that included transport, local development, energy, environment and finance. In addition, Hungary had access to the EU's Cohesion Fund which is a structural instrument that helps Member States to reduce economic and social disparities and to stabilise their economies. The Cohesion Fund made available to all Member States €15.9 billion (in 2004 prices) in 2004-2006, but more than half of the funding (EUR 8.49 billion) was reserved for activities in Member States that most recently joined the EU such as Hungary.

1319. Legislation implemented in Hungary targeted many different aspects of controlling ODS including methyl bromide. The Government amended the 1993 legislation[207] in 1994 and 1996 to ban new uses of the main ozone-depleting substances, to require qualified technicians to work on equipment containing ODS (from 1 January 1997), to require dismantling and disposal of ODS equipment in authorised centres (from 1 January 1998), to restrict the use of halon, to limit the quantity of methyl bromide imported to the 1991 level (from 1 January 1995), to require record keeping for ODS that was greater than 100kg, and to impose dissuasive sanctions 10-100 times more than the current ODS market price per kilogram.

1320. The combination of funding from government, private (companies / technicians) and EU was assessed in this evaluation as likely to be sufficient to sustain activities in Hungary on alternatives to methyl bromide. The sustainability of the programme is also discussed in Section 8.5.3.3.4 "Environmental" (on page 289), in regard to the monitoring and reporting requirements that are required under EU environmental legislation as the legislation considerably improved the prospects for sustaining the phase out of methyl bromide.

8.5.3.3.2 Socio-political

1321. The methyl bromide phase out project was coordinated by Project Coordination Unit (PCU) that was an independent company responsible for project management and administration. The National Ozone Unit (NOU) within the Ministry of Environment and Water (MEW) was the Executing Agency. A National Steering Committee (NSC) provided technical advice to PCU/MEW.

1322. The major use of the methyl bromide in Hungary was for the disinfestation of nematodes in soil in glasshouses and tunnel houses that were used to produce vegetables, especially paprika and tomato. Soilless cultivation using rockwool is now common practice in the large glasshouses and replaced soil, and bio-control of pests is becoming more prevalent. Arpad, the largest glasshouse grower of paprika and tomatoes, has about one-quarter of their 40 ha of GH under bio-control and expects to double this area in 2010. Soilless production combined with bio-control practices produces tomatoes and paprika less expensively than when methyl bromide was used. Moreover, soilless and bio-control are more sustainable crop production practices as pesticides are not used. These production practices have strong consumer, grower and government support.

[207] MERP Decree 22/193.

1323. The socio-political environment was assessed as highly satisfactory since it was supportive of the methyl bromide-free methods that were appreciated by the consumers, growers and the government.

8.5.3.3.3 Institutional framework and governance

1324. The institutional structure for the project consisted of a Project Coordination Unit (PCU) that was an independent company responsible for project management and administration. The National Ozone Unit (NOU) within the Ministry of Environment and Water (MEW) was the Executing Agency. A National Steering Committee (NSC) provided technical advice to PCU/MEW.

1325. The Regional Plant and Soil Protection Service (Ministry of Agriculture and Regional Development) and Corvinus University delivered the Train-the-Trainer (TTT) courses, assisted by two former methyl bromide fumigation companies (Zephyr and Arpad). Kecskemet College monitored and evaluated (M&E) the training. FAO provided training expertise for the Farmer Field Schools (FFS) together with organiser Agro-Mester Ltd. Specialised equipment training was delivered by Imants who provided the rotary spader equipment.

1326. The range of organisations involved in Hungary was assessed as sufficient to promote the sustainability of the methyl bromide phase out because these government and commercial organisations were staffed by personnel that had built up experience in activities related to the reduction and phase out of methyl bromide, including training in best-practice management of alternatives to methyl bromide and optimisation of the conditions and procedures to use the alternatives cost-effectively.

8.5.3.3.4 Environmental

1327. The main driver affecting the use of methyl bromide in Hungary was national and EU legislation that existed at the time of the project that restricted the use of methyl bromide and that required activities by users and Member State competent authorities. The EU legislation has since been superseded by revised legislation that has eliminated the use of methyl bromide altogether.

1328. The environmental legislation that was in force in the EU at the time of the project and until 31 December 2009 was Regulation (EC) 2037/2000. This legislation required Member States:

- To phase out the placing on the market of non-QPS uses of methyl bromide by 31 December 2004;
- To put in place all precautionary measures practicable to prevent and minimise leakages of methyl bromide from fumigation installations and operations in which methyl bromide is used;
- To define the minimum qualification requirements for the personnel involved in methyl bromide fumigation;
- To require producers, importers and exporters of methyl bromide to report to the European Commission on the quantities of ODS produced, imported and exported annually; and
- To submit annual reports on the use of methyl bromide and its alternatives, critical uses of halons, the use of CFCs in medical products that control asthma, the phase out of halon on ships and in aircraft, and the quantity of ozone-depleting substances recovered, reclaimed, recycled and destroyed.

1329. In 1994 and 1996, Hungary amended its 1993 national legislation on ODS to include a ban on any new uses of the main ozone-depleting substances which, *inter alia*, limited the quantity of methyl bromide imported in Hungary from 1 January 1995 to the quantity imported in 1991. This had the effect of a freeze in consumption in 1995. Users that stored more than 100kg of ODS including methyl bromide were required to keep records. Dissuasive sanctions 10-100 times more than the current ODS market price per kilogram were implemented. Therefore, in the mid-1990s there were government initiatives that limited the availability of ODS including methyl bromide. A secondary affect of the limitation was that it encouraged the development of ODS-free alternatives as a way of controlling pests without the restrictions inherent in the ODS substances.

1330. Hungary developed and implemented an effective national strategy and programme which enabled it to achieve the Montreal Protocol's scheduled phaseout deadline of 31 December 2004. Hungary did not submit any requests for Critical Use Exemptions to the Montreal Protocol from 1 January 2005 onwards[208]. The EC did not use Critical Uses of methyl bromide from 1 January 2009.

1331. New legislation on ODS came into force on 1 January 2010. Regulation (EC) No 1005/2009 replaced Regulation (EC) 2037/2000. Methyl bromide did not meet the safety criteria and was de-registered in the Biocides Directive[209] (non-plant pesticide) from 1 September 2006, and in the Pesticides Directive[210] (Plant Protection Product, PPPD) from 18 March 2009.

1332. Regulation (EC) No 1005/2009 allows MB-QPS stocks[211] to be used until 18 March 2010, but limits the quantity to 45 ODP-tonnes from 1 January to 18 March 2010, and none from this date onwards. Up until 18 March, methyl bromide can only be used for QPS at government-approved fumigation sites and only if degassing equipment is in place to recover 80% of the methyl bromide used in the fumigation. Methyl bromide may be used for Emergency Uses[212] for controlling unexpected pest outbreaks, but only if it is first authorised by the European Commission and providing methyl bromide is permitted under the Biocides and Pesticides Directives. Currently, methyl bromide is not permitted in these Directives and *ipso facto* it cannot be used for QPS. Therefore, all uses of methyl bromide including those for QPS are banned in the EU including Hungary from 19 March 2010.

1333. The main environmental risk that could undermine the implementation of the alternatives in Hungary is illegal imports of methyl bromide. However, this seems unlikely since there have been no cases of illegal trade in ODS in the past three years that have withstood legal proceedings following their interception. In addition to the inspection and monitoring procedures that have been implemented for ODS including methyl bromide, the previous and current regulation on ozone-depleting substances has in place a requirement for Member States to put in place *effective, proportionate and dissuasive* penalties for illegal import of ODS or illegal use of ODS.

1334. About 20 Customs officers were trained in the past. The MEW reported that these officers passed on their knowledge on ODS detection and control to their colleagues that operated at the border. In 2000 and 2004 the Hungarian Customs and Finance Guard (VPOP) organised a '*Green Customs*' meeting in Budapest, in collaboration with UNEP. The information from these meetings was disseminated to Customs officers that were not at the meetings. The MEW and the Customs agencies communicate on an as-needed basis.

1335. Hungary was assessed as having put in place satisfactory measures to combat illegal trade in ODS. The Customs agency undertook both administrative and physical inspections of imported ODS, and provided reports to MEW on the results of their inspections in the event that ODS was intercepted.

1336. The risk of methyl bromide import and use re-establishing in Hungary was assessed as low, because of the national and EU legislation, as well as Custom's ODS surveillance procedures and reporting that were in place to detect and confiscate any imports of methyl bromide which would be illegal.

8.5.3.4 Catalytic role

1337. The key factors influencing catalytic action are *innovation, demonstration, replication* and *co-operation*. In this methyl bromide sub-project, the two factors that influenced catalytic action were *replication* and *co-operation*.

1338. The Project Coordination Unit was responsible for encouraging a '*bottom to top*' training

---

[208] TEAP. 2009. Critical Use Nominations for Methyl Bromide. Annex IV. Part A: Trend in Pre-Plant Soil Applications. Part B: Trends in Post-harvest Structural and Commodity Applications. Period 2005 to 2010. Information supplied by the Ozone Secretariat to MBTOC. Pages 79-83.

[209] Regulation (EC) 2032/2003

[210] Decision 2008/753/EC

[211] Articles 12 (1) (2) in Regulation (EC) No 1005/2009 on ODS

[212] Articles 12 (3) in Regulation (EC) No 1005/2009 on ODS

process. This increased the capacity of stakeholders to sustain the phase out and to take operational decisions that were both effective and economically viable. The planned activities and the use of cooperative methods of delivery laid the foundation for a supportive framework that implemented the alternative technologies.

1339. As a result of the project, UNEP organised the participation of experts from the World Bank and the MLF to promote the *replication* of the training activities developed in this regional project. The training manuals were translated (into Russian), for broader use in the Eastern Europe and Central Asian region, at the cost of the MLF funds of the ECA network.

1340. Bulgaria produced a Manual[213] for soil sector specialists (primarily future trainers and facilitators of Farm Field Schools) on practical ways to implement alternatives to methyl bromide. This was translated from Bulgarian into English by FAO so that it could be used to cooperate with soil specialists in other countries. Hungarian experts produced a chapter in the Manual entitled "*Cultivation in Hungary without Methyl Bromide*", which described the use of methyl bromide in the past and its replacement today with chemical and non-chemical alternatives. UNEP planned to use the training Manual and other materials developed under this project as a useful resource in the OzonAction Clearinghouse programme, so that a wider audience could benefit from the experiences in the CEIT countries in the implementation of alternatives to methyl bromide.

1341. The NOU co-operated with other departments, ministries and organisations (as described in Section 8.3.3.3.2) on a diverse range of activities on ozone layer protection. The World Bank officer responsible for the Ukraine methyl bromide project, as well as the Regional Ozone Network for Europe and Central Asia, were kept informed of the results of this project because of its potential to help with the phase out of methyl bromide in other countries.

1342. For these reasons, this methyl bromide regional phase out project was assessed as having a useful catalytic role.

8.5.3.5 Achievement of outputs and activities

8.5.3.5.1 Delivered outputs

1343. Paragraph 1293 above showed the basis for selecting the following achievement or performance indicators:

- Provision of methyl bromide publications and materials (with provisions for translation into local languages) to support *awareness-raising* activities;
- Training workshops or modules on *policy development* for the control of methyl bromide (bringing together policy makers, Customs officers, importers, users, producers)
- *Training courses/workshops* to educate stakeholders on alternatives and to develop training strategies for local extension workers on promoting and implementing alternatives;
- *Investment activity* to implement suitable methyl bromide alternatives for control of pests in soil (pre-harvest) and durable commodities (post-harvest); and
- The phase out of non-QPS methyl bromide consumption.

1344. The delivered outputs are discussed for each of them below.

8.5.3.5.1.1 Awareness raising

1345. The GEF/UNEP Project[214] "*Initiating early phase out of methyl bromide in CEITs through awareness raising, policy development and demonstration/training activities*" assisted Hungary to sustain its phase out of methyl bromide.

1346. The project consisted mainly of awareness raising activities on the uses of methyl bromide and its alternatives, policy development for methyl bromide phase out, identification of alternatives, diffusion of demonstration results, adoption of alternatives, and implementation of national programmes. Workshops were held in Hungary (23-25 April 2001, soil uses) and Bulgaria (28-30

[213] FAO and UNEP. 2008. Manual: Alternatives to replace methyl bromide for soil-borne pest control in East and Central Europe. Edited by R. Labrada. FAO. 102 pp.

[214] GF/4040-00-10. Prof Reuben Ausher Review reported in October 2003.

May 2002, postharvest uses). This specific awareness raising work on methyl bromide was part of a broader awareness raising programme in Hungary on the need to phase out ozone-depleting substances generally.

1347. In 2003, Hungary consumed 15.8 tonnes of methyl bromide[215]. The most frequent reason cited by farmers for soil fumigation was to control nematodes (55% of farmers), whereas fungi (34%) and weeds (18%) were reported to be less problematic. The major items of equipment financed by the Project to eliminate methyl bromide use for soil pests were 6 rotary spader machines and two tractors supplied equally to the enterprises Zephyr and Arpad.

1348. Training courses were held on alternatives to methyl bromide, many in collaboration with FAO. These are described in Section 8.5.3.5.1.3.2 *Training on alternatives to methyl bromide* below.

1349. A demonstration day on "*Methyl Bromide Free Greenhouse Growing Alternatives*" was organized and held by the Corvinus University for a large number of farmers. The programme included presentations on chemical soil fumigation, container and rock-wool growing, biofumigation and biological methods. Practical demonstrations were held in glasshouses and tents/tunnels near the presentation site. More than two hundred farmers attended the demonstration day. The FAO expert Mr. Ricardo Labrada participated in both the presentation programme and the field visit.

1350. A pamphlet on how the project was implemented and its results was published in November 2007. The pamphlet included summaries of the training monitoring, technical monitoring and the developmental work. A section on recommendations for the post project activities was added after the National Steering Committee meeting in October 2006.

1351. Recommendations for post-project activities were completed in December 2007 by Prof István Terbe. The pamphlet was published in February 2008 and was disseminated to the trainers and to the relevant ministries (Ministry of Environment and Water and Ministry of Agriculture and Rural Development).

1352. The results of an M&E survey undertaken by the MEW showed that the farmers wanted more practical assistance and less theory; and more economic information on the cost of alternatives to MB. However, this information was difficult to obtain as it was price-sensitive, altered according to growing technologies and other conditions, and was confidential.

1353. Awareness raising in this project on alternatives to methyl bromide in Hungary was assessed as having been delivered.

8.5.3.5.1.2 Policy development

1354. Hungary harmonised its national legislation several years in advance of adopting EC legislation on the phase out of ozone-depleting substances when it acceded to the EU on 1 May 2004. In 1994 and 1996, Hungary amended its 1993 national legislation on ODS to include a ban on any new uses of the main ozone-depleting substances which, *inter alia*, limited the quantity of methyl bromide imported in Hungary from 1 January 1995 to the quantity imported in 1991. This had the effect of a freeze in consumption in 1995. In addition, users that stored more than 100kg of ODS including methyl bromide were required to keep records. Dissuasive sanctions 10-100 times more than the current ODS market price per kilogram were implemented.

1355. Therefore, in the mid-1990s there were government initiatives that limited the availability of ODS including methyl bromide. A secondary affect of the limitation was that it encouraged the development of ODS-free alternatives as a way of controlling pests without the restrictions inherent in the ODS substances. Legislation introduced by Hungary prior to 2004 banned the placing on the market of non-QPS methyl bromide.

1356. The development of the policies and the implementation of the legislation in Hungary, were assessed as having been delivered.

8.5.3.5.1.3 Training courses and workshops

1357. The evaluation team assessed Hungary as having the key elements in place to combat illegal trade, and that as a result the risks of methyl bromide entering Hungary illegally would be

[215] Ozone Secretariat Data Centre, May 2009.

minimal. Based on the workshops and courses that were provided to farmers, the evaluation team assessed that training on methyl bromide alternatives had been delivered. The reasons for these assessments are provided in the next two sections on *Customs Training* and *Training on Alternatives to Methyl Bromide*.

8.5.3.5.1.3.1 Customs training

1358. Detection of illegal imports of methyl bromide and other ODS was important in Hungary for ensuring that only the amount of methyl bromide placed on the market did not exceed the amount that was reported to be consumed in 1991. Restricting the amount of methyl bromide on the market encouraged growers to adopt alternatives when methyl bromide supply was insufficient to meet all the pest control requirements.

1359. About 20 Customs officers were trained prior to the project. The NOU reported that these officers passed on their knowledge on ODS detection and control to their colleagues that operated at the border. After the Project was completed, in 2000 and 2004 the Hungarian Customs and Finance Guard (VPOP) organised 'Green Customs' meetings in Budapest, in collaboration with UNEP. The information from these meetings was disseminated to Customs officers that were not at the meetings.

1360. Although the Customs officers were trained and have the necessary equipment to detect ODS, the NOU reported that the detection equipment was under-utilised because Customs officers considered that any interceptions increased their administrative reporting and reduced their ability to address other more important activities such as detecting illegal imports of drugs.

1361. There have been no cases of illegal trade in ODS in the past three years that have withstood legal proceedings following the interception. Dissuasive penalties for illegal trade are contained in EC and national ODS legislation. The MEW and the Customs agencies communicate on an as-needed basis. The evaluation team assessed Hungary as having the key elements in place to combat illegal trade, and that the risks of methyl bromide entering Hungary would be minimal.

8.5.3.5.1.3.2 Training on alternatives to methyl bromide

1362. In the project "*Total sector methyl bromide phase out in countries with economies in transition*", the Regional Plant and Soil Protection Service (Ministry of Agriculture and Regional Development) and Corvinus University delivered the Train-the-Trainer (TTT) courses, assisted by two former methyl bromide fumigation companies (Zephyr and Arpad). Kecskemet College monitored and evaluated (M&E) the training. FAO provided training expertise for the Farmer Field Schools (FFS) together with organiser Agro-Mester Ltd. Specialised equipment training was delivered by Imants who provided the rotary spader equipment.

Figure 23: Rotary spader adapted for use in glasshouses with nematocide as liquid (front tanks) or granules (red rear tanks). Zephyr , Hungary.

1363. Seven trainers delivered 14 Farmer-Field-School (FFS) courses, each course consisting of half-day on 6 non-consecutive days, to about 250 farmers. FFS courses that were delivered in the locations closest to the farmers were well-attended. Five technical publications were produced[216]. Experts participated in a study tour to Spain to see alternatives, and farmers made local visits to Arpad (tomatoes and peppers in glasshouses on rockwool) and Floratom (container growing of plants). Farmers assessed the training as extremely useful, and requested it to continue after the Project finished.

[216] 1) Greenhouse growing (*sic*) without soil fumigation with methyl bromide (MB); 2) The phase out of MB in Hungary: Information on the implementation of the Project; 3) General information on MB-free growing (used by trainers in FFS); 4) The FAO participatory method; 5) Alternatives to replace methyl bromide for soil-borne pest control in East and Central Europe – Manual (FAO).

8.5.3.5.1.4 Investment activity

1364. Investment activity concerned the supply of equipment by UNDP to two companies in Hungary – Zephyr Agricultural Services, and Arpad.

8.5.3.5.1.4.1 Zephyr agricultural services

1365. Zephyr Ltd is the distributor for Nemasol (51% metam sodium) and an owner of two spaders and a tractor (Figure 23). The rotary spader was neither particularly well suited to the GH and PT conditions, nor to driving on the road to farmers' properties, but the company undertook no significant modifications to improve both aspects. After MB was banned, the quantity of Nemasol for nematode control increased 8 times. Nemasol is about half the cost of MB. Despite the reduced cost of the alternative, Zephyr was not able to put the rotary spaders to full use because of the increase in the use of soilless cultivation, which now extended to about 50% of the company's previous MB-fumigated area.

Figure 24: Sweet peppers and tomatoes grown in rockwool soilless media without methyl bromide. Arpad, Hungary.

1366. Zephyr provided a range of services (fertilizers, fumigation) and advice to growers including training (3 courses provided in the Project). Zephyr expressed an interest in being more active in bio-control. The company valued the Project because it laid the foundation for an expansion of more sustainable pest control methods. However, it took too long to execute because of administrative and procurement delays, to the extent that the company missed the season for MB-free fumigation.

Figure 25: Insect predators replace pesticides (left) in large glasshouses (right). Arpad, Hungary.

1367. A recent development had increased the prospect for greater use of the rotary spaders. A German company had recently purchased land for the production of strawberry runners, which was a new crop for Hungary. Strawberry runners have been traditionally produced in the EU in Poland, the Netherlands and Spain. Countries that produced strawberry runners were required to obtain an exemption ('critical use') from the Parties to the Montreal Protocol for the use of methyl bromide after 1 January 2005. As the equipment and nematacide for strawberry runner production is now available to Zephyr, due to the funding for the GEF project, Hungary is in a position to produce strawberry runners without methyl bromide. Production of strawberry runners presented a new business opportunity for Zephyr.

8.5.3.5.1.4.2 Arpad glasshouse

1368. Árpád Ltd uses underground thermal energy to heat about 40ha of glasshouses for tomato and pepper production on soilless media (Grodan rockwool) (Figure 24). The company founded Árpád Biokontroll in 2003. Árpád replaced pesticides with a range of predatory insects (Figure 25) and mites to control pests on 9.8 ha of tomatoes and peppers (red and sweet). This area was expected to double in 2010. Árpád Biokontroll had expanded its business to become the agent for Biobest, who is an international producer and marketer of beneficial insects and mites for biological and integrated crop protection.

1369. Other growers affiliated to Árpád were being trained in bio-control methods. Árpád offered 10-

15 courses each year. The cost of bio-control was now about equal to pesticide control, but the market paid 10-15% more for food produced from a bio-control program. Árpád helped to establish the growers packing and marketing cooperative DélkerTész Szentes in 2002, which represented 530 growers (80% of total) and shipped 30% of the product out of Hungary in supermarket-ready packaging. The company packed 48 tonnes of produce per day in 2.5 shifts. They were developing a brand image for the area and the production methods.

1370. Árpád was satisfied with the soil fumigation equipment that they received in the Project. They modified the equipment to improve coverage in the glasshouse by removing one of the tanks. Stability was improved with a weight on the front. The machinery was used mostly in the summer season. Árpád predicted that the use of the equipment would decrease further as bio-control programmes become more widespread.

8.5.3.5.1.4.3 Summary of the contribution of companies to the phase out of methyl bromide

1371. Both Zephyr and Árpád have driven the methyl bromide phase out in a way that is a model for other companies to emulate. They have adopted the alternative technology, modified it where necessary, and treated the soil for nematodes without the use of methyl bromide for several years after the Project was completed. The use of the spaders has declined with the expansion of artificial soil in which nematodes were no longer pests. Árpád in particular is a pioneer in bio-control technology in glasshouses which is very successful. The programme has had a catalytic effect on the growers locally as the cost of bio-control was about the same as chemical control. The programme to eliminate methyl bromide stimulated a revolution in the production of food with minimal chemical input, and Árpád is one of the best leaders of this revolution.

8.5.3.5.1.5 The phase-out of methyl bromide consumption

1372. All farmers have eliminated the use of methyl bromide. MEW expressed general satisfaction with the outcome of the Regional Project on methyl bromide. MEW considered that there was a need for better monitoring of the technical efficacy of the alternatives and their cost-effectiveness.

1373. The sustained phase out of methyl bromide since 1 January 2004 has maintained Hungary's compliance with the Montreal Protocol and with EC legislation on ozone-depleting substances. Therefore, the objective of the Regional Project to phase out methyl bromide in Hungary was achieved.

1374. The Project strengthened Hungary's stakeholder understanding of environmental legislation, as well as promoting greater ministerial and institutional cooperation. It provided a springboard for the companies involved in the phase out of methyl bromide to explore more environmentally-friendly techniques, which may eventually lead to a non-chemical treatment.

1375. However, the majority of vegetable-producing farmers are still dependent on chemical fumigation, which may not be sustainable due the toxicological review required under Regulation (EC) No 91/414 that has led to restrictions on the use of many fumigants and the elimination of many of them. The possibility of going back to methyl bromide is not an option as there is now a diverse array of legislation in the EU that closes off this option. While the bio-control procedures are the most sustainable, they are also the most knowledge-intensive, so training will become even more important.

1376. Companies such as Árpád with their bio-control programmes will become the norm, not the exception. The training infrastructure and methodology developed in this Project could be used to expand the use of soilless media and bio-control by all farmers. Marketing and branding of products that have been produced as a result of these biocontrol programmes has been initiated, and the revenue from them could be expanded to broaden the marketing opportunities.

8.5.3.5.2 Awareness about ODS, ODS substitute technology, and strengthening of institutional capacities to achieve the ODS phase-out

1377. The extensive work in Hungary to increase the awareness of ozone layer depletion was described in Section 8.5.3.5.1.1 *Awareness raising* above. The work on methyl bromide substitute technology, which focused on two enterprises that implemented methyl bromide free pest

control methods, was described in Section 8.5.3.5.1.4 *Investment activity* above.

1378. The NOU was already strong in the beginning, as shown by the extensive legislation that was drafted and implemented in the mid-1990s. The NOU's capacity was further strengthened by several GEF-funded projects. The first was a GEF/World Bank Project that targeted all ODS for phase out except methyl bromide and HCFCs. The second was a small Project that aimed to reduce the use of methyl bromide, which was a followed by this third and altogether larger Project on methyl bromide which aimed to phase it out.

1379. The NOU successfully coordinated the work of the organisations to deliver information on a range of suitable alternatives to the stakeholders. There was a strong commercial presence, as both Zephyr and Arpad were actively seeking alternatives to methyl bromide for the past 15 years. The combination of lectures and hands-on activities in Hungary using both government and commercial sources of information expedited the widespread use of alternatives by farmers and the sustained phase out of the use of methyl bromide.

8.5.3.5.3 Authority / credibility, necessary to influence policy and decision-makers

1380. The NOU in Hungary had the authority / credibility, necessary to influence policy and decision-makers, which was shown mainly through the NOUs actions and ability:

- To provide methyl bromide publications and materials to support *awareness-raising* activities;
- To implement *policies and measures* to control of methyl bromide, bringing together policy makers, Customs officers, importers, users, producers;
- To coordinate *training courses/workshops* to educate stakeholders on alternatives and to develop training strategies for local extension workers on promoting and implementing alternatives;
- To encourage *investment activity* to implement suitable methyl bromide alternatives for control of pests in soil (pre-harvest) and durable commodities (post-harvest); and
- The phase out of non-QPS methyl bromide consumption.

1381. This credibility has been established by an NOU within the MEW that cooperated with a diverse range of government bodies in Hungary that were involved in ODS (Section 8.5.3.3.2 *Socio-political* above described these bodies). The NOU was assessed as well-qualified to carry out tasks on methyl bromide reduction and phase out due to a combination of political, technical and administrative expertise.

8.5.3.6 Assessment of monitoring and evaluation systems

8.5.3.6.1 Monitoring and evaluation design

8.5.3.6.1.1 UNDP

1382. UNDP took responsibility for the monitoring and evaluation of the investment component. At the end of each project year, the UNDP Montreal Protocol Unit aimed to evaluate the degree to which the objectives of the investment project had been achieved. Supervision missions were planned to be undertaken by relevant experts appointed by UNDP as necessary. The UNDP monitoring and evaluation activities were to be in addition to the normal monitoring and evaluation activity in the project undertaken as standard UNDP procedures.

In the participating countries, independent bodies were identified to also be responsible for M&E activities, as it was considered important to reduce the implementation period to meet the phase out deadlines. The M&E body was designed to act as a continuous management tool, visiting MB users, identifying success and failure factors, and providing information to the Project Coordination Unit and particularly feedback to the Steering Committee and Technical Committee, consultants and Implementing Agencies. The implementation, coordination and monitoring arrangements for the UNEP/UNDP/GEF Project[217] were shown in Figure 20 on page 224.

[217] From: UNDP. 2003. Total Sector Methyl Bromide Phase Out in Countries with Economies in Transition. GEF – UNDP Project Document. 29 pp. Page 25.

8.5.3.6.1.2 UNEP

1383. UNEP designed an annual monitoring and evaluation format to assess the non-investment activities, and also provided a Final Assessment design which aimed to report on the results of the project.

8.5.3.6.1.3 Annual evaluation by UNEP

1384. UNEP completed a '*Project Performance and Risk*' Table annually that measured and rated progress toward achieving the project objectives and assessed implementation progress. The progress was reported for each of the countries individually.

1385. The attainment of the project objective, which was '*preservation of the ozone layer*', was measured against the outcome of a '*Sectoral phase out of methyl bromide in countries as required by the schedule of the Montreal Protocol*'. This outcome was defined as uses that were non-QPS and non-CUE, as both QPS and CUEs were permitted under certain conditions.

1386. UNEP's M&E design[218], which aimed to annually measure implementation progress, referenced the requirement to monitor '*outputs*' (Table 40, column 2). UNEP also reported on progress with the implementation of the investment activity that was under the responsibility of UNDP.

Table 40: UNEP-designed "outputs" and "indicators" that were used to monitor progress and evaluate success in the methyl bromide phase out project implemented in Bulgaria

NO	OUTPUT	INDICATOR
Column 1	**Column 2**	**Column 3**
Document	*3) Project Performance and Risk* 2) *Final Evaluation*	*4) Final Evaluation*
1	Development and implementation of cost-effective, sustainable, national phase out coordination structures and mechanisms to carry out the project work, cope with future methyl bromide phase out problem areas, and sustain phase out post-project	Permanent National Steering Committee, Technical Group, and trained extension service and user groups in countries at project end; registration of additional pest control products where needed; implementation of additional policy measures where needed.
2	Rapid transfer of replacement technologies to MB users, including installation of equipment and participatory training at local level, focusing on a quick replacement for the 2005 growing season to permit country compliance with the Montreal Protocol, [focus on non-chemical and IPM MB alternatives from 2006 onwards][219] [using fumigants/chemicals as necessary][220]	Replacement of MB use in sectors by chemical and non-chemical alternatives at the end of the project
3	Enhanced awareness and confidence of MB users and other stakeholders in the phase out process, through the monitoring of the efficacy and economic performance of alternatives, and increased ability of users to manage pest control problems and find solutions	Detailed regular reports by the Project Coordination Unit and the National M&E Unit on the progress of the MB replacement amongst MB users across sector and sub-sectors. Survey reports of the national M&E Unites, will include investigations into the mindset of the MB users towards the project and phase out exercise
4	Capacity building for the development of	Reports by the Project Coordination Unit

[218] UNEP. 2008. GEF PIE FY 2008 (for the period 1 July 2007 to 30 June 2008).
[219] Text in UNEP "Annual Evaluation" but not "Final Evaluation"
[220] Text in UNEP "Final Evaluation" but not "Annual Evaluation"

NO	OUTPUT	INDICATOR
Column 1	**Column 2**	**Column 3**
Document	*3) Project Performance and Risk* 2) *Final Evaluation*	*4) Final Evaluation*
	more environmentally friendly MB alternatives (primarily based on non-chemical methods), reducing dependency on fumigants/chemical alternatives to ensure sustainability in the long term	and the National M&E Unit on the progress of non-chemical and IPM MB alternatives amongst MB users across sector and sub sectors

1387. UNEP also completed annually a '*Risk Factor*' Form, which was a combination of text and check boxes. The Project Manager and the Task Manager assigned ratings to the perceived risk as either '*low, medium, substantial, high, not applicable or to be determined*' for a range of project criteria: Project Management (Management structure, governance structure, internal communications, work flow, co-finance, budget, financial management, reporting, stakeholder involvement, external communications, short/long term balance, science and technological issues, political influences, other); and Project Context (political stability, environmental conditions, social/cultural/economic factors, capacity issues, other).

1388. UNEP also completed a '*Rating Monitoring and Evaluation*' Form, including the M&E activities that were carried out during the reporting period. The mainly text answers in this section covered a broad range of issues, such as the quality of the initial baseline methyl bromide consumption, the usefulness of the indicators that were used to assess performance, any challenges faced by UNEP to obtain data that were required to assess the indicators, and lessons learnt in regard to M&E.

8.5.3.6.1.4 Final Evaluation

1389. UNEP's M&E design[221], which aimed to measure the overall success of the project, referenced the requirement to monitor '*outputs*' (Table 40, column 2) and '*indicators'* (Table 40, column 3). The '*indicators'* were used by UNEP only for the Final Evaluation and they were not used in the Annual Evaluation. UNEP also reported on the overall success of the investment activity that was under the responsibility of UNDP.

8.5.3.6.1.5 Evaluation comments on M&E design

1390. The following comments address the ability of the M&E design to track and monitor progress toward achieving the project's objectives:

- The annual implementation progress was not measured against the performance indicator, and it was difficult to see how progress was therefore determined;
- The output often contained more than one element (e.g., cost-effectiveness, coordination, structures/mechanisms, future problem areas), but the response by UNEP addressed some of them;
- Some elements were used in the as an output, but a performance indicator was not developed to measure the output e.g. cost-effectiveness[222];
- '*Problems in delivering outputs'* was a column on the Form that was rarely if ever completed by UNEP, which suggested that the projects had no difficulties achieving the outputs required;
- '*Expected completion date'* was a column on the Form that was rarely if ever completed by UNEP, which showed that SMART indicators were not used;
- The column format resulted in very long reports because for most of the form only about one-quarter of the page could be used, which made reading the form difficult;
- One Risk Factor table was completed for all five countries involved in the project,

[221] UNEP. 2008. Project Final Report – Bulgaria. 8 pp.

[222] The cost-effectiveness of alternatives to methyl bromide is very difficult to measure as it depends on the timing of the market, the methods used by the farmer, the level of pest infection at the time, and many other factors. At no stage was the financial value addressed, suggesting that cost-effectiveness was addressed superficially.

whereas in reality the risks were not uniform for all countries;

- The methyl bromide baseline for the project did not take account of the latest consumption data reported to the Ozone Secretariat at the time of the initiation of the project, which resulted in greater expenditure than needed to eliminate less methyl bromide than originally determined by the baseline;
- The evaluation of the M&E undertaken during the project was helpful as it assessed the status and quality of the M&E procedures; and
- The indicators used in the Final Evaluation should have been used to measure performance in the Annual Evaluation.

1391. These limitations in the M&E design were assessed as reducing the ability of UNEP to assess the progress in the implementation of the project that aimed to introduce alternatives to methyl bromide in Hungary.

1392. UNDP's Monitoring and Evaluation Plans were contained in Annex 5A: *Monitoring, Progress Reporting and Evaluation* and Annex 5B: *Terms of Reference for the Regional/International Project Steering Committee.* These Annexes were omitted from the UNDP Project Document and could not be evaluated.

8.5.3.6.2 Monitoring and evaluation plan implementation

1393. The M&E plans (annual and final) were implemented by UNEP, as evidenced by the reports provided to the evaluators. There were no reports that were made available to the evaluators from UNDP.

1394. Although the design of the M&E plan had limitations, its value lay in the 'follow-up' by UNEP that clearly signalled to participants that their progress in this project was being monitored and evaluated. In addition, UNEP required reporting from participants on progress, which was then used to in these annual reports, and workshops were held to share information and keep the project on track.

8.5.3.6.3 Budgeting and Funding for monitoring and evaluation activities

1395. UNEP budgeted $10,000 for the "*…risk evaluation and development of the monitoring and evaluation strategy…*", and $5,000 for the "*… Evaluation Report (including survey results, needs (technical, financial, policy, training), awareness strategy, identification of co-funding partners, preliminary risk evaluation results…*". These direct costs associated with M&E activities may have also been supplemented by UNEP's activities in general, in their role as Project Coordinator/Consultant. UNDP also was assigned a budget of $45,000 for travel and national consultants, but funds for M&E were not separately identified.

1396. The funding for M&E represents 6.7% ($15,000 of $225,000) of the total budget which, for an important activity, appeared to be relatively small. There was no information on budget versus expenditure and therefore it was not possible to assess the timing of the funding and compliance of expenditure with the budget assigned.

8.5.3.6.4 Long-term monitoring

1397. There was no requirement for long term monitoring in this project. However, Hungary as a Member State of the EU has national reporting obligations under EU legislation on methyl bromide that it is imported or produced for feedstock and process agent uses[223]. Other uses of methyl bromide are no longer permitted under EU legislation after 18 March 2010, and therefore there are no other reporting requirements related to methyl bromide.

1398. Article 7 "*Reporting of data*" in the Montreal Protocol requires Parties to report by 30 September each year on their consumption and production of ODS in the previous year. Hungary reported 2003 consumption data to the Montreal Protocol, but consumption data for 2004 onwards was reported by the European Commission on behalf of the EC including Hungary as a new Member State.

1399. In addition, Decision XV/15 that was agreed in 2003 encouraged Parties to forward data on

[223] Article 27 of Regulation (EC) No 1005/2009 on Substances that Deplete the Ozone Layer that came into force on 1 January 2010

consumption and production to the Secretariat as soon as the figures became available, and preferably by 30 June each year, rather than 30 September in order to facilitate the work of the Protocol's Implementation Committee. The Implementation Committee has not remarked on any aspects of data reporting by Hungary, which suggested that reporting had been timely and accurate. The Ozone Secretariat reported in 2009 that most Parties complied with the voluntary June deadline.

1400. Data reporting by the EU to the Montreal Protocol on methyl bromide consumption is the most important action on long-term monitoring. Zero consumption reported by Hungary to the EU would result in zero consumption being reported by the EU to the Montreal Protocol. An EU report of zero consumption would indicate that methyl bromide has been phased out in the EU including Hungary, and continual reporting of zero consumption annually by the EU would indicated that the phase out has been sustained.

1401. Data reporting, and the infrastructure necessary for this, is expected to continue for ozone-depleting substances in general and for specific methyl bromide uses as described above. The costs for these data reports are expected to be included in the annual budget by the government of Hungary for work assigned to the NOU.

8.5.3.7 Assessment of processes that affected attainment of project results

8.5.3.7.1 Preparation and readiness

1402. The main activity that indicates preparation and readiness for a project is the legislation that was in place in Hungary prior to the start of the project to control methyl bromide, and the government and commercial infrastructure necessary to implement alternatives to methyl bromide that was in place in Hungary prior to the start of the project.

1403. Prior to the start of the project in December 2005, Hungary had in place legislation that banned new uses for ODS, required qualified technicians to work on equipment containing ODS (from 1 January 1997), required the dismantling and disposal of ODS equipment in authorised centres (from 1 January 1998), restricted the use of halon for fire protection, limited the quantity of methyl bromide imported to the 1991 level (from 1 January 1995), required record keeping for ODS that was greater than 100kg, and imposed dissuasive sanctions 10-100 times more than the current ODS market price per kilogram.

1404. The earlier project entitled "*Initiating early phase out of methyl bromide in CEITs through awareness raising, policy development and demonstration/training activities*" had helped to set up the infrastructure that was needed to implement the current project. That project had been instrumental in establishing teams in each country that consisted of specialists on alternatives to methyl bromide, workshops as a focus for information exchange, government ministries that were involved in the phase out of methyl bromide, awareness raising activities, policy development and training. In addition, commercial companies had been involved in the demonstrations and visits. The government and commercial infrastructure had eliminated 90% of the methyl bromide, leaving the current project with a strong infrastructure to eliminate the remaining 10% (4.2 ODP-tonnes) of the methyl bromide as 48.6 ODP-tonnes had already been eliminated.

1405. Hungary had been active in hosting workshops on alternatives to methyl bromide. The GEF/UNEP Project "*Initiating early phase out of methyl bromide in CEITs through awareness raising, policy development and demonstration/training activities*"[224] focused on the development and translation of public awareness materials, demonstration projects, regional training activities, and policy development. It commenced in March 2000 and concluded in September 2002. Workshops in that project were held in Hungary (23-25 April 2001, soil uses) and Bulgaria (28-30 May 2002, postharvest uses).

1406. The government implemented legislation after 2000 as a requirement to harmonise Hungarian legislation on ODS with those of the EU prior to accession on 1 May 2004. It is likely that the government of Hungary will remain committed to the phase out of any remaining ODS. However, ODS has become a secondary issue as the primary effort is now directed toward compliance with legislation on F-gases. Many of the activities on F-gases such as qualification

[224] GF/4040-00-10 for CEITs Bulgaria, Estonia, Hungary, Latvia, Lithuania, Poland and Slovakia.

requirements and monitoring of leakages in equipment, are also appropriate for controlling the monitoring the use of ODS and its replacements. A decree in 2008 in Hungary combines ODS and F-gases in the same legislation, thereby facilitating control and reporting activities.

1407. Hungary was assessed as well-prepared and ready for this project, as the legislation to control methyl bromide and the government and commercial infrastructure necessary to implement alternatives to methyl bromide, were in place well before the start of the project.

8.5.3.7.2 Country commitment and motivation

1408. Hungary had put in place a range for activities to manage the phase out of methyl bromide. Among these, it had established an effective and sustainable administrative structure for monitoring the import and use of methyl bromide by companies. The MEW assigned an independent company responsible for project management and administration. The leader of the company was an ex-employee of MEW and therefore there was a high level of trust and confidence in their abilities to manage and coordinate the activities in the project.

1409. Training of farmers in the Farmers Field School courses had a significant impact in delivering hands-on guidance to farmers on alternatives to methyl bromide. The schools were well attended. Hungary funded the visit of experts to Spain to see the use of alternatives in that country and to apply as many of them as possible back in Hungary. Arpad, with its team of technicians that were active in the tomato and paprika glasshouses, provided essential advice to visiting growers who were keen to learn pesticide-free methods of production. The farmers themselves assessed the training as very useful and wanted the training to continue after the project was finished.

1410. From the end of the Project, the government has continued to show a significant commitment to financing staff to work on ODS phase out activities. The leader of the NOU coordinates activities on the phase out of ODS as well as activities related to fluorinated gases, and contracts out work to other organisations when this becomes financially feasible.

1411. The government of Hungary, by its policies, legislative measures and actions, has demonstrated that it is fully committed to the phase down and elimination of all ODS including methyl bromide. Hungary's approach to methyl bromide control and management was reinforced several years before it joined the EC in 2004, and has continued after that time. There is very little risk that this commitment by Hungary to continue to eliminate all ODS including methyl bromide will waiver.

8.5.3.7.3 Stakeholder involvement

1412. The main stakeholders in Hungary that were involved in the project were the Project Coordination Unit (PCU) that was an independent company responsible for project management and administration. The National Ozone Unit (NOU) within the Ministry of Environment and Water (MEW) was the Executing Agency. A National Steering Committee (NSC) provided technical advice to PCU/MEW. There were two commercial companies involved that had a significant impact on the phase out of methyl bromide (Zephyr, and Arpad). The Regional Plant and Soil Protection Service (Ministry of Agriculture and Regional Development) and Corvinus University delivered the Train-the-Trainer (TTT) courses. Kecskemet College monitored and evaluated (M&E) the training. FAO provided training expertise for the Farmer Field Schools (FFS) together with organiser Agro-Mester Ltd. Specialised equipment training was delivered by Imants who provided the rotary spader equipment.

1413. The NOU/MEW successfully coordinated the work of these organisations to deliver information on a range of suitable alternatives to the stakeholders. The combination of lectures and hands-on activities expedited the widespread use of alternatives by farmers and the subsequent phase out of methyl bromide. The partnerships formed as a result of the involvement of these stakeholders was assessed as creating effective stakeholder participation to progress the work of the NOU and the MEW in ozone layer protection.

8.5.3.7.4 Financial planning

1414. UNEP reported that the funds were correctly managed and transparently accounted for in the project. There was also no concern whatsoever on the financial management and planning as all

budgets were managed as expected in the sub-projects and MOUs of the project. Expenditure in some countries did not reach the budget, which enabled UNEP to re-allocate funds in response to end-of-project requests for activities that were slightly over the budget.

1415. In October 2006 at the International Project Steering Committee Meeting in Sofia, the participants recommended that future projects should put in place procedures to source financial support for the use and refinement of alternatives and technology after the project is completed. In 2007, discussions were initiated on potential EC funds that could be used to support long-term research and validation of alternatives.

8.5.3.7.5 UNEP supervision and support

1416. UNEP reported that reports submitted by the countries in this project were *"… substantive reports presented in a timely manner … they were complete and accurate with a good analysis of project progress and implementation issues".* At the final meeting of the project participants in October 2006 in Plovdiv, there was general appreciation for UNEP's assistance and guidance that had been given to countries during the course of in this project.

8.5.3.7.6 Co-financing and project outcomes & sustainability

1417. There was no requirement for co-finance of the activities of UNDP and UNEP in this programme. However, France committed to provide $50,000 toward the administrative costs of UNDP and UNEP, but these funds did not eventuate[225]. The UNEP regional budget included $1,921,929 of in-kind co-finance[226] for non-investment activities, and the UNDP regional budget included expected in-kind contributions of $373,400227 for investment activities. The amount of co-finance declared by Hungary for non-investment and investment activities in this project was $503,018.

1418. The co-finance was for office space and facilities for national project personnel and international experts working on the project; for participation of Government personnel that implemented project activities; for providing transportation, facilities for installation of equipment, and logistic support to the project; for communications; for personnel for technical assistance, site visits; and for personnel and other resources for the monitoring and evaluation exercises.

1419. In 2008, UNEP reported that co-financing from four out of the five countries exceeded the co-finance envisaged at the start of the project start[117]. In the case of Hungary, actual costs totalled $691,086 which consisted of $188,068 from the GEF and a significant level of co-finance (in-kind) from Hungary of $503,018.

1420. A significant level of in-kind co-finance demonstrated the commitment of Hungary to the project and probably increased the Hungary's "ownership" of the programme. Increased ownership has been shown in other projects to promote sustainability, since the government and commercial commitment is greater than when there is a financial stake in a successful outcome to the project.

1421. Although co-finance is important, there were other factors that were assessed as having a greater impact on the sustainability of the programme than co-finance, such as the EU legislative requirement to eliminate the use of methyl bromide by 31 December 2004 (see Section 8.5.3.6.4). However, a sustainable source of funds to support the continued implementation of alternatives, and the refinement of the alternatives, after the project finished was considered very important by the members of the National Steering Committee at their meeting in October 2006. Further monitoring of pest problems may be warranted as a result of global warming which may result in warm-adapted pests extending their southern range northwards toward Hungary in the future.

8.5.3.7.7 Project implementation delays and impact on project outcomes & sustainability

1422. Procurement of equipment by UNDP Bratislava office was delayed because of UNDP difficulties coordinating between the national Customs authorities and the involvement of UNDP personnel in some of the countries in the project. The variety of rules and practices in the different

[225] UNEP. 2008. GEF PIR FY2008. 50 pages
[226] UNEP. 2008. UNEP GEF PIR FY 2008 Review 1. For the period 1 July 2007 to 30 June 2008. 50 pp
[227] UNDP. 2003. Total Sector Methyl Bromide Phase Out in Countries with Economies in Transition. GEF – UNDP Project Doc. 29 pp.

countries was not anticipated by UNDP, and each country had to be addressed individually in each case, which contributed to the overall delay in procurement and imports.

1423. Although procurement and project closure were delayed, these delays did not affect the national phase out since appropriate registration and legislative instruments were required by EC legislation to be in place, which prevented any prospect of a return to the use of methyl bromide. Restrictions on methyl bromide use, sale and import in Hungary had been implemented according to Regulation (EC) No 2037/2000 in Hungary well in advance of Hungary's accession to the EU on 1 May 2004.

1424. All farmers have eliminated the use of methyl bromide. However, the majority of vegetable-producing farmers are still dependent on chemical fumigation, which may not be sustainable due the toxicological review required under Regulation (EC) No 91/414 that has led to restrictions on the use of many fumigants and the elimination of many of them. The inability to register new formulations of traditional fumigants, and to maintain registration for existing fumigants, threatens the ability of users to have access in the longer term to effective pest control procedures. The possibility of going back to methyl bromide is not an option as there are now several legislative instruments in the EU that ban the use of methyl bromide due to its toxic properties. While the bio-control procedures are the most sustainable, they are also the most knowledge-intensive, so training will become increasingly important in the future.

8.5.3.8 Sub-Project Rating

GF/4040-05-05 Total Sector Methyl Bromide Phase Out in Countries with Economies in Transition - Hungary		
Criterion	**Evaluator's Summary Comments**	**Evaluator's Rating**
Attainment of project objectives and results Sub criteria (in yellow below)	See comments below	
Effectiveness	The project was designed to phase out methyl bromide by 31 December 2004, but in Hungary it started one year later and after methyl bromide had been phased out for non-QPS uses. The project was effective in assisting Hungary to maintain the phase out	HS
Relevance	Conversion to non-ODS technology, awareness raising programmes and other activities to eliminate methyl bromide are consistent with minimising the detrimental effect of ODS on the ozone layer	HS
Efficiency	The cost-effectiveness of the phase out project in Hungary was assessed as relatively inexpensive for the GEF as it was about half the cost of the average methyl bromide phase out project in developing countries.	HS
Sustainability of Project outcomes (overall rating) Sub criteria (in yellow below)	See comments below	
Financial	The combination of funding from government, private (companies / technicians) and EU was assessed in this evaluation as likely to be sufficient to sustain activities in Hungary on alternatives to	HS

GF/4040-05-05 Total Sector Methyl Bromide Phase Out in Countries with Economies in Transition - Hungary		
Criterion	**Evaluator's Summary Comments**	**Evaluator's Rating**
	methyl bromide.	
Socio-Political	The socio-political environment was assessed as highly satisfactory since it was supportive of the methyl bromide-free methods that were appreciated by the consumers, growers and the government	HS
Institutional framework and governance	The range of organisations involved in Hungary, as well as the legislation that had been implemented well in advance of the project, were assessed as sufficient to promote the sustainability of the methyl bromide phase out	HS
Environmental	National and EU legislation, as well as Custom's ODS surveillance procedures and reporting that were in place, results in low risk of methyl bromide being used again	HS
Achievement of outputs and activities		
Monitoring and Evaluation (overall rating) Sub criteria (in yellow below)	See below	
M&E Design	Annual monitoring and evaluation format to assess the non-investment activities, and a Final Assessment design which aimed to report on the results of the project.	S
M&E Plan Implementation (use for adaptive management)	Some limitations in the M&E design were assessed as reducing the ability of UNEP to assess the progress in the implementation of the project	S
Budgeting and Funding for M&E activities	M&E represents 6.7% of the total budget which appeared to be relatively small	S
Catalytic Role	No categorisation required	
Preparation and readiness	Legislation well in advance, good control of illegal trade, many training courses and good government and commercial involvement in advance of the project showed that Hungary was well-prepared and ready	HU
Country commitment and motivation*	Hungary's policies, legislative measures and actions demonstrate that it is fully committed to the phase down and elimination of all ODS including methyl bromide	HS

GF/4040-05-05 Total Sector Methyl Bromide Phase Out in Countries with Economies in Transition - Hungary		
Criterion	**Evaluator's Summary Comments**	**Evaluator's Rating**
Stakeholder involvement	The partnerships formed by the government and the companies created effective stakeholder participation that resulted in the phase out of methyl bromide	HS
Financial planning	Funds were correctly managed and transparently accounted for by Hungary in the project. Further funds need to be sourced to continue the work after the closure of the project in order to refine the efficacy of the alternatives	S
UNEP supervision and support**	General appreciation for UNEP's assistance and guidance that had been given to countries during the course of in this project.	HS
Overall Rating		HS

Highly Satisfactory (HS); Satisfactory (S); Moderately Satisfactory (MS); Moderately Unsatisfactory (MU); Unsatisfactory (U); Highly Unsatisfactory (HU);
*Motivation replaced TOR '*driveness*'; **Support replaced TOR 'backshopping'

Blank page for double-sided printing

6 Kazakhstan

8.6.1 Background

1425. Kazakhstan declared independence from the Soviet Union in 1991. The years following independence have been marked by significant reforms to the Soviet command-economy and political monopoly on power. There was a significant increase in company privatisation and expanded economy activity in the mid-1990's. Since 2000, Kazakhstan has enjoyed significant economic growth, mainly due to its large oil, gas and mineral reserves.

1426. In 1997, Kazakhstan used ozone-depleting substances (ODS) for refrigeration (61%), foam (22%), halon (16%) and solvent (1%) uses. The increased consumption of ODS reflected the strengthening of the economy in the late 1990s. Kazakhstan's CFC consumption had almost doubled from 1,206 ODP-tonnes in 1991 to 2,218 ODP-tonnes in 1993[228]. Kazakhstan's ODS consumption in 1998 when the country programme was being formulated was 1971 ODP-tonnes[229], of which 52% were CFCs that should have been phased out 2 years earlier. At that time, Kazakhstan did not produce or export ODS, but imported ODS from the Russian Federation.

1427. The Republic of Kazakhstan acceded to the Vienna Convention and the Montreal Protocol on 26 August 1998; and the London Amendment on 26 July 2001. Kazakhstan has yet to ratify the Copenhagen, Montreal and Beijing Amendments. As a developed country, Kazakhstan was required to comply with the requirements of the Montreal Protocol which required to phase out of the consumption of halon on 1 January 1994; and CFCs, methyl chloroform and carbon tetrachloride on 1 January 1996.

1428. Kazakhstan was in non-compliance with the Montreal Protocol each year from 1996 to 2001 due to the consumption of CFCs and halon, at time when consumption of both should have been zero. Kazakhstan notified the Parties in 1996 that it expected to be in non-compliance until at least 2004. The Parties to the Montreal Protocol noted[230] in 2001 that Kazakhstan committed to benchmark targets for ODS that:

1) Reduced CFC consumption to 162 (2002), 54 (2003) and zero (2004) ODP-tonnes;
2) Established a system for licensing imports and exports of ODS by 1 January 2003;
3) Banned imports of ODS-containing equipment by 1 January 2003;
4) Reduced halon consumption to 5.08 ODP-tonnes in 2002 and zero by 2003;
5) Phased out CTC and methyl chloroform consumption by 1 January 2002;
6) Reduced methyl bromide consumption to 2.7 (2002), to 0.44 (2003), and zero (2004) ODP-tonnes[231].

1429. The Parties in 2001 urged Kazakhstan to work with the relevant Implementing Agencies to reduce its consumption of ODS. The Parties noted in 2005 that Kazakhstan had not implemented a ban on ODS-containing equipment, and that CFC consumption in 2004 was 11.2 ODP-tonnes instead of zero, both being commitments for zero consumption given by Kazakhstan in 2001.

1430. From 2004 until 2007, Kazakhstan has reported consumption in excess of the quantities applicable to developed countries in the Montreal Protocol for HCFCs. Similarly for 2006 and 2007, Kazakhstan reported consumption in excess of the quantities applicable to developed

---

228 Ozone Secretariat Data Centre. 28 April 2009. Data reported by the Parties under Art 7 of the Montreal Protocol.
229 Ozone Secretariat Data Centre. 28 April 2009. Data reported by the Parties under Art 7 of the Montreal Protocol.
230 Decision XIII/19. 2001. Compliance with the Montreal Protocol by Kazakhstan.
231 Decision XVII/35: 2005. Potential non-compliance in 2004 with the controlled substances in Annex A, Group I (CFCs) by Kazakhstan, and request for a plan of action

countries in the Montreal Protocol for methyl bromide.

8.6.2 *Generalised objectives, output and performance indicators*

1431. The design of the UNEP and UNDP projects for Kazakhstan did not require clearly defined logframe analysis and prior agreed performance indicators (PIs) at the time of their formulation and approval. The 2004 Mid-Term Review undertaken for the UNEP-managed projects identified the issue of the absence of results-based management and accountability framework, including the lack of PIs in the UNEP sub-projects.

1432. In the absence of these PIs, project outputs and outcomes and PIs based were developed for this Terminal Evaluation Assessment, based on the results of the mid-term evaluation, the UNEP PIRs and achievements that became evident during the assessment of each of the sub-projects. Table 72 summarises these generalised objectives, outputs and outcomes that were used as a guide in the assessment of each of the sub-projects in the Kazakhstan country report[232].

Table 41: Generalised objectives, outputs and outcomes that were used as a guide in the assessment of each sub-project

Objectives/Intended Results	Outputs/Deliverables	Outcomes/Performance indicators
1. Strengthening of the national capacity to effectively coordinate and administer the actions outlined in the Country Programme and the Refrigerant Management Plan	1. Establishing the National Ozone Unit and initiating actions that created a suitable climate in the country for the expeditious phase-out of ozone-depleting substances (ODS) 2. Political priority assigned by the Government to environmental issues and to the objectives of the Montreal Protocol in particular	1. Strengthened institutional capacity and improved coordination among stakeholders: • Time required for UNEP to disburse the first funding tranche • Timely recruitment of sufficient and qualified National Ozone Unit staff • Timely establishment of adequate infrastructure • Provision of the counterpart funding • Continuity of National Ozone Unit staff and operation • Ratification of Montreal Protocol Amendments • Establishment of the Interagency Committee • Approval of the Action Plan • Access of National Ozone Unit staff to decision makers
2. Legislative measures that promote the phase-out of ODS	3. Development, promotion and adoption of legislative acts and regulations on control of ODS	2. Introduction of legal acts regulating ODS import related issues and their enforcement: • Adoption of legislation on ODS import/export licensing system • Establishment of ODS import quota system • Register of authorized importers • Introduction of ban on trade of ODS and equipment containing ODS • Adoption of qualification requirements for servicing activities • Adoption of legislation that mandates ODS recovery, reclamation and recycling

[232] As each Country Report is a self-contained chapter with its own Annex, for completeness (but at the expense of repetition) the same Table showing these generalised objectives, outputs and outcomes was provided in each Country Report.

Objectives/Intended Results	Outputs/Deliverables	Outcomes/Performance indicators
		• Measures on enforcement of legislation through training of customs officers • Change of market price between CFCs and substitutes
3. Increased coordination and monitoring of the Country Programme and the Refrigerant Management Plan	4. Effective interaction with governmental institutions and agencies 5. Increased cooperation with business sector and professional associations 6. Assistance in the coordination and monitoring of the implementation of investment and training sub-projects executed by Implementing Agencies as part of the Refrigerant Management Plan	3. Improved coordination and monitoring in implementation of the Country Programme and the Refrigerant Management Plan: • Evidence of access of National Ozone Unit to, and interaction with, decision makers • Involvement of private sector stakeholders • Establishment and support of the Refrigeration Association • Successful completion of training of custom officers together with UNEP • Successful completion of training of good servicing practices • Successful completion of training of ODS recovery, reclamation and recycling operators • Successful completion of conversion of to non-ODS technology
4. The design and implementation of ODS awareness programme	7. Conducting awareness workshops for central and regional governmental officials, environmental inspectors and customs officers on Montreal Protocol objectives 8. TV and radio interviews on ozone layer protection issues 9. Dissemination of booklets about ozone layer protection, and implementation of National ODS Phase out Programme	4. Improved communication with, and effective engagement of governmental and non-governmental institutions, professional organizations, private sector and general public, in ODS phase out activities 5. Reduction of ODS consumption due to public awareness programme • Number of workshops and degree of participation of institutions listed in (4) above • Number of publications prepared and disseminated • Degree of market penetration of ODS-free products and methodologies
5. Support and encourage local industry and technical institutes to adopt ODS-free substitute technologies	10. Support in conversion of manufactured equipment to non-ODS technology 11. Coordination in the provision of modern tools and equipment to servicing workshops in the domestic, commercial refrigeration and air-conditioning sectors	6. Adoption ODS-free substitute technologies 7. Adoption of good servicing practices and availability of modern tools in the refrigeration sector, including recovery and recycling • ODP-tonnes phased out • Number of servicing sets provided to servicing enterprises
6. The collection of required data on ODS use and consumption, establish the lines of communication in the country and reporting to the Ozone Secretariat and Implementing	12. Collection, analysis and exchange of Montreal Protocol-related information in the country and the region 13. Preparation of annual	8. Establishment the line of communication with the Customs authority and licensed importers as a means of collecting ODS import data 9. Establishment the line of

Objectives/Intended Results	Outputs/Deliverables	Outcomes/Performance indicators
Agencies	reports on ODS consumption and National Ozone Unit activities to the Ozone Secretariat 14. Preparation and submission of necessary information and reports to the Implementing Agencies 15. Exchange of experience between the National Ozone Unit and other Network members to combat illegal trade in ODS, including sub-regional cooperation	communication with National Ozone Units in border countries: • Creation of ODS database • Availability of Montreal Protocol-related information on the Ozone-Secretariat website • Reports of the Implementation Committee • Participation in Central Asia and Eastern Europe Networking • Assessments of the quality of the National Ozone Unit reports by Implementing Agencies
7. Country reduction and phase out of the consumption of controlled ODS by the agreed date	16. Coordination of the implementation of the National ODS Phase out Programme	10. Compliance with ODS phase out schedule established by the Parties in a specific Decision, as a result of the considerations of the Protocol's Implementation Committee

8.6.3 Sub-Project finance

1433. The Project objectives were to phase out 679 ODP-tonnes of ODS by:

- Strengthening the government institutional capacity to coordinate and manage the phase out of ODS, including providing training to Customs officers to improve the monitoring and control of ODS;
- Establishing a network of refrigerant recovery, recycling ("3R") and reclamation operations that would provide sufficient CFCs to service existing equipment; and to undertake training in the best practices of refrigerant management to minimise emissions of CFCs in the stationary and mobile air-conditioning systems;
- Eliminating the use of CFCs used in flexible and rigid foam production;
- Eliminating the use of CFC-113 as a solvent in the manufacture of liquid chlorine; and
- Establishing a halon bank to service existing fire protection systems until halon-free fire protection systems are installed

1434. To achieve these objectives, the GEF funded the following 6 sub-projects in Kazakhstan:

- GF/4040-01-13 – Programme for Phasing Out ODS - Merged Institutional Strengthening and training of trainers for use of ODS-free refrigerants including training of custom officers (UNEP)
- KAZ/00/G31 – National programme for recovery and recycling of ODS refrigerants (UNDP/UNOPS);
- KAZ/00/G33 – Elimination of the use of CFCs at 14 manufacturers of rigid polyurethane foam enterprises (UNDP/UNOPS);
- KAZ/00/G34 – Elimination of the use of CFCs at 25 manufacturers of flexible foam enterprises (UNDP/UNOPS);
- KAZ/00/G35 – Replacement of CFC-113 in the cleaning of oxygen manufacturing equipment at Pavlodar (UNDP/UNOPS);
- KAZ/00/G36 – National halon management scheme programme (UNDP/UNOPS)

As indicated for each sub-project, UNDP and UNEP were the Implementing Agencies for the investment and technical assistance sub-projects respectively.

1435. The project commenced in January 2002 and was completed on December 2006. The main causes of the delay were administrative and implementation difficulties. The total budget was $5,346,139 which consisted of $5,433,452 from the GEF, $110,000 from the government of Kazakhstan and $638,839 from private enterprises. The budget was allocated to each sub-project as shown in Table 45.

Table 42: Summary of allocation of funds to each of the sub-projects that phased out ozone-depleting substances in Kazakhastan

Title	Sub-project number	IA	Prodoc signature	Duration	Phase-out target (ODP-tonnes)	GEF budget* ($)
Train the Trainers	GF/4040-01-13	UNEP			N/A	1,091,275
Institutional Strengthening					N/A	
National Programme for recovery & recycling of refrigerants	KAZ/00/G31	UNOPS/ UNDP	Sept 2001	3 years	359.6	2,545,219
Terminal Umbrella Project, Rigid Polyurethane Foam	KAZ/00/G33	UNOPS/ UNDP	Sept 2001	3 years	104.9	1,154,374
Technical Assistance Project, Flexible Polyurethane Foam	KAZ/00/G34	UNOPS/ UNDP	Sept 2001	3 years	45	285,120
Replacement of CFC-113 in the cleaning of oxygen manufacturing equipment at Pavlodar	KAZ/00/G35	UNOPS/ UNDP	Sept 2001	3 years	6	106,920
National halon management scheme programme	KAZ/00/G36	UNOPS/ UNDP	Sept 2001	3 years	101.9	163,231
Total					**617.4**	**5,346,139**

* This amount includes UNOPS / UNEP Executing Agency Support Cost and Project Support Services given by the UNDP country office; IA = Implementing Agency

8.6.4 GF/4040-01-13 Programme for ODS phase out - Merged Institutional Strengthening and Training of Trainers for use of ODS-free refrigerants including training of custom officers (UNEP)

8.6.4.1 Introduction

1436. Sub-project GF/4040-01-13 aimed to strengthen Kazakhstan's national capacity to effectively coordinate and administer the actions outlined in their Country Programme and their Refrigerant Management Plan (RMP). In particular, the sub-project aimed to facilitate:

- The establishment of a National Ozone Office (NOU) to undertake, complete and monitor all activities and projects described in the CP and the RMP;
- The implementation of legislative measures to promote compliance with Kazakhstan's obligations under the Montreal Protocol;
- The development of an ODS knowledge base in all sectors of civil society; and
- The adoption ODS-free substitute technologies by local industry.

1437. A strengthened NOU would enable Kazakhstan to highlight to national stakeholders the environmental damage caused by ODS, and how this could be avoided with the use of substitutes to replace ODS. A strengthened NOU would also realise Kazakhstan's commitment to meet or exceed the requirements under the Montreal Protocol by phasing out specific ODS consumption by 2003.

1438. In regard to training, a strengthened NOU would build the capacity to establish policy instruments to facilitate the implementation of ODS regulations in regard to codes of good practices and certification scheme for refrigeration and air-conditioning technicians; and train the custom officials to control imports and exports of ODSs and ODS-dependent equipment. A strengthened NOU would also put in place a training infrastructure for continued training when the sub-project had been completed.

1439. The strengthening of the NOU and training of technicians and Customs officers was originally two projects. However, Kazakhstan saw that they were closely related and requested that they be merged into one sub-project to facilitate implementation. To facilitate this assessment and when relevant, however, the strengthening of the NOU and the training of technicians were assessed separately.

8.6.4.2 *Attainment of objectives and planned results*

8.6.4.2.1 Effectiveness

1440. The effectiveness was evaluated according to the performance indicators for Institutional Strengthening, training of technicians and training of Customs officers.

8.6.4.2.1.1 Institutional strengthening

1441. The performance indicators[233] for the Institutional Strengthening aspect of this sub-project were the:

- Establishment of an NOU;
- Facilitation of legislative measures for the phase-out of ODS;
- Design and implementation of ODS awareness programmes;
- Collection of the required data on ODS use and consumption;
- Coordination and monitoring of an Action Plan to phase-out ODs.

1442. The achievement of outputs and activities by Kazakhstan, as measured against these performance indicators, are provided in Section 8.6.4.5.1 "*Delivered outputs*" below.

8.6.4.2.1.2 Training of technicians

1443. Implied Performance Indicators for refrigeration and air-conditioning technician training[234]:

- Evidence of assistance provided to the Government of Kazakhstan to draft and implement Codes of Good Practice for this sub-sector;
- Evidence that refrigeration courses in technical schools now cover ozone layer protection and good practices are part of the curriculum;
- Evidence that local refrigeration technicians are able to service refrigeration equipment in a way that reduces losses by 20-30%;
- Evidence (where possible) that this project has lead to a reduction in ODS consumption;
- Evidence of manual of good practice in refrigeration was produced and distributed; and
- Evidence that a national system of certification for technicians is introduced.

1444. The specified Performance Indicators[235] for refrigeration and air-conditioning technician training:

- Training of 400 refrigeration technicians in Phase I by March 2002;
- Training of 2000 refrigeration technicians in Phase II by December 2003;
- Training of 100 MAC technicians in Phase I by March 2002;
- Training of 700 MAC technicians in Phase II by December 2003;
- Purchase of equipment for 1 training centre by January 2002;
- Inclusion of the training module in the training institution by July 2002;

1445. The total number trained in the 3R sub-project was therefore 3,365 personnel in 51 training sessions in all regions of the country, which exceeds the minimum number specified in the sub-contract of 3,200 technicians. Kazakhstan therefore has met and exceeded the number of technicians that should have received training in this sub-contract.

1446. The achievement of outputs and activities by Kazakhstan, as measured against these performance indicators for the technician training courses, including the equipment and training modules for technicians, are discussed in Section 8.6.4.5.1 "*Delivered outputs*" below.

---

[233] Buxton, G.V. and R. Ciconkov. 2004. A Mid-Term Evaluation of UNEP's GEF-Sponsored Capacity Development and Institutional Strengthening Projects in Countries with Economies in Transition. Report prepared for UNEP-EO. 174pp. Page 176.

[234] Buxton, G.V. and R. Ciconkov. 2004. A Mid-Term Evaluation of UNEP's GEF-Sponsored Capacity Development and Institutional Strengthening Projects in Countries with Economies in Transition. Report prepared for UNEP-EO. 174pp. Page 176.

[235] In Project Document for Kazakhstan

8.6.4.2.1.3 Training of customs officers

1447. The specified Performance Indicators for Customs officers[236]:

- Training of minimum 60 custom officers by June 2002;
- Purchase of identification equipment for the custom entry points by June 2002.

1448. In 2003, 61 Customs officers were trained in two courses[237] on the different types of ODS and equipment packaging and hazardous chemicals, which exceeds the minimum number specified in the sub-contract of 60 customs officers. Kazakhstan therefore has met and exceeded the number of Customs officers that should have received training in this sub-contract.

1449. The achievement of outputs and activities by Kazakhstan, as measured against these performance indicators for the Customs officer training courses, including the equipment and training modules for technicians, are discussed in Section 8.6.4.5.1 "*Delivered outputs*" below.

8.6.4.2.2 Relevance

1450. The reduction and phase out of ODS in Kazakhstan is consistent with the objectives of the Vienna Convention and the Montreal Protocol, which *requires Parties to take appropriate measures in accordance with the provisions of this Convention and of those Protocols in force to which they are party to protect human health and the environment against adverse effects resulting or likely to result from human activities which modify or are likely to modify the ozone layer*[238].

1451. The GEF established in 1995 an Ozone Layer Depletion Focal Area in response to the Montreal Protocol. The Focal Area has the strategic objective of protecting human health and the environment by assisting countries to phase out their consumption and production of ODS, to prevent emissions of ODS, and to encourage the uptake of alternative technologies and practices according to a country's commitments under the Montreal Protocol. The financial interventions in the GEF Focal Area contribute to the return of the ozone layer to pre-1980 ozone levels, which is expected by 2065.

1452. Most recently, the dual capability of ODS to both reduce ozone and to have a detrimental impact on the climate have been described[239]. Global ODS consumption in 1989 was equivalent to about 9,200 million tonnes (9 Gt) CO_2-eq/year, which was reduced to about 1,870 million tonnes (1.8 Gt) CO_2-eq/year in 2007 as a result of ODS phase-out activities under the Montreal Protocol. This reduction of about 7 Gt CO_2-eq/year was at least three times greater than the Kyoto Protocol's reduction target (about 1-2 Gt CO_2-eq/year in 2008-2012), demonstrating that the global ODS reductions achieved so far have already yielded a larger climate benefit than the current Kyoto Protocol target.

1453. The actions taken by Kazakhstan to phase out ODS is therefore relevant to further protection of the ozone layer (Montreal Protocol) and relevant to reducing the impact of radiative forcing of the climate (Kyoto Protocol).

8.6.4.2.3 Efficiency

1454. The mandate of the Climate Change Coordination Centre (CCCC) is to serve as the national implementation and coordination agency for projects on ozone layer protection decided by the MNREP. The Government authorized the MNREP to coordinate activities on the ODS phase-out in cooperation with the CCCC. Today, there are 6 staff within CCCC that work on ozone layer protection. For this project, the government co-financed 9.5% of the total value of the project ($110,000).

1455. The CCCC coordinates its activities on ODS with representatives of the MNREP, the Ministry of Economy and Trade, the Ministry of Foreign Affairs, the Ministry of Agriculture, the Ministry of Energy and Natural Resources, the Ministry of Transport and Communication, the Ministry of Justice, the Ministry of Finance, the Agency on Strategic Planning, the Ministry of Defence, the Ministry of State Revenue, and the Agency on Emergency Situations. Representatives of these

---

236 In the Project Document for Kazakhstan

237 Astana 3-5 March 2003; Almaty 22-24 December 2003.

238 Handbook for the Vienna Convention for the Protection of the Ozone Layer - 7th Edition (2006). Article 2: General Obligations.

239 Velders, J.M., Andersen, S.O., Daniel, J.S., Fahey, D.W. and M. McFarland. 2007. The Importance of the Montreal Protocol in protecting climate. http://www.pnas.org/content/104/12/4814.abstract

organisations are mostly in Almaty and Astana, but also in other regions of Kazakhstan such as Pavlodar where the NOU undertakes activities.

1456. The CCCC is therefore a relatively small team that can operate efficiently in this project to leverage resources to address ODS phase out activities in various parts of Kazakhstan.

8.6.4.3 Assessment of sustainability of project outcomes

8.6.4.3.1 Financial resources

1457. About 30% of the funding received by the CCCC is used for ozone layer protection, and the remainder to address climate change issues. CCCC is funded through commercial contracts with clients and by grants received from international donors. For some of the work undertaken by the CCCC, the MNREP contracts CCCC for specific tasks such as the maintenance of a database on ODS (contracted since 2003).

1458. The CCCC competes with the other agencies in Kazakhstan to undertake work, such as the Kazakhstan Scientific and Research Institute of Ecology and Climate (KSRIEC). Work in the future on the phase out of HCFCs may be contracted to this Institute, with a sub-contract to CCCC. In this context, the UNEP funds for institutional strengthening that were approved for two 3-year periods (from 2002 – 2005; December 2008 to 2011) were reported by the NOU to be relatively small but important for their ongoing activities.

1459. A relatively large NOU of six staff within the independent CCCC was able to direct about 30% of its activities to ozone layer protection. The funding for the NOU originated entirely from international donors and successful bids for contracts to undertake work for companies and national organisations. The evaluation team assessed the risk of NOU closure due to lack of finance for activities on ozone layer protection as low, because the CCCC is funded from multiple sources and it now has an 8-year track record of existence since June 2002. Conversely, the funding from multiple sources helps to place the NOU on a sustainable financial footing.

1460. The CCCC must bid for government contracts and is not assured of finance from the central budget. The continued success of the CCCC therefore depends on its record of carrying out work to standard acceptable to the various funding agencies. In this light, the funding for the CCCC could be regarded as more stable than NOUs in other countries that must rely on funding for their ozone protection activities from a single source – the government – which can alter funding according to political and economic imperatives.

1461. In this sub-project there was 9.5% co-financing by the government of Kazakhstan. However, there was a delay of several years[240] between the first and second Institutional Strengthening projects of about 2.5 years when in-kind resources (working hours, office space and equipment) were supplied by the CCCC. The precise amount of in-kind financing was not recorded. The loss of one source of funding for a prolonged period did not result in closure of the NOU because it depends on multiple sources of funding for its operation, and in this sense there is sustainability beyond the funding period of the project.

8.6.4.3.2 Socio-political

1462. The Government of Kazakhstan not fully accepted the *international commitments in the Montreal Protocol* and its amendments. The government does not appear to be committed to implementing legislation in a timely manner, which has resulted in Kazakhstan exceeding the control measures applicable to developed countries but still remaining compliant with the Montreal Protocol as it has not ratified the relevant amendments to the Montreal Protocol. Kazakhstan faces many challenges to implement its commitments given the importance of CFCs and halons to the industrial sector.

1463. Kazakhstan established a *framework for coordination* to facilitate action to reduce and phase out ODS consumption. The Project was initially developed and coordinated in 2000 by an NOU that was established in the National Environmental Centre for Sustainable Development (NECSD) within the Ministry of Natural Resources and Environmental Protection (MNREP). NECSD was

[240] At the 16th Meeting of the Parties to the Montreal Protocol in November 2004, the GEF recognized the need for further assistance to CEITs, and pledged continued assistance through GEF IV to the Parties of the Montreal Protocol. An umbrella IS renewal project (covering Azerbaijan, Kazakhstan, Tajikistan and Uzbekistan) was developed in 2005, and was approved by the GEF CEO for Council consideration in August, 2006. Disbursement of funds for IS to these countries began in 2009.

supported by an interdepartmental commission consisting of MNREP, and representatives from the Ministries of Energy; Industry and Trade; Transport; Communications and Tourism; Defence; Health and Sport; State Revenues (includes Customs Committee); Agriculture; and Science & High Education. The Agency of Statistics was also a member of the commission. The NOU has the coordinating role with the agencies and ministries to facilitate the reduction and phase out of ODS.

1464. Kazakhstan *engaged in partnerships with stakeholders* in the industrial and public sectors to implement its strategy of ozone layer protection through extensive awareness raising and legislative activities. The NOU promoted the use of non-ODS substances and technologies. New suppliers of substances were needed from new suppliers that were typically not in the Russian Federation. A refrigeration association does not exist in Kazakhstan which was assessed as a major partner that could assist with the delivery of ODS activities after the projects are completed.

1465. Due to this tripartite approach by Kazakhstan, combined with the multiple sources of funding for the NOU, the activities to reduce and eliminate ODS were assessed as having a reasonable prospect of continuation after the project is completed.

8.6.4.3.3 Institutional framework and governance

1466. The Institutional framework and governance in the work undertaken by Kazakhstan was assessed as robust, mainly because of the political support from Ministry of Natural Resources and Environmental Protection. The MNREP influences policy on ozone layer protection in the government and funds project activities within the CCCC, some of them related to the reduction and phase out of ODS. The National Ozone Unit was established as a separate agency whose responsibilities included the initiation, coordination and execution of activities related to ozone layer protection.

1467. Because of this institutional framework and governance, the assessment team considered the prospects were reasonably promising for the continuation of activities that lead to further reductions in ODS. However, the government needed to show greater commitment to implementing legislation in a timely manner, in order to bring Kazakhstan into line with control measures applicable to developed countries in the Montreal Protocol.

8.6.4.3.4 Environmental

1468. There are a number of environmental risks that, if not controlled, were assessed as likely to undermine the gains in protection of the ozone layer that had been achieved to date. The main risks included Illegal trade, suspension of training activities for technicians, limited adoption of legislation to control ODS, as well as poor halon and methyl bromide management.

8.6.4.3.4.1 Illegal trade

1469. Some companies reported that CFCs from the Russia Federation and China could still be purchased on the market, and the price was about $5/kg. The presence of inexpensive CFCs on the market and illegal imports present a risk to further progress in the phase out of ODS consumption in Kazakhstan.

1470. The Customs Agency believes that more than 5,000 officers are needed to control illegal trade along their very long border. However, only 61 out of 5,000 Customs officers in Kazakhstan have attended the training courses, and had been issued with refrigerant identifiers. This is equivalent to less than 1.5% of the officers in the Agency being trained and equipped to detect illegal shipments of ODS.

1471. The Customs Agency reported that the equipment used to detect and differentiate different types of ODS was not particularly suitable, which gave the impression that they were not widely used.

1472. Legislation was in place to support Customs in its work to apprehend smugglers of ODS and equipment, but the detail of this legislation did not appear to be known by the Customs Agency. One company reported that Customs officers could be bribed to make decisions in favour of the importing company, particularly if the paperwork was shown to be in order.

1473. The refrigerant identifiers were not certified and their recorded readings were not acceptable as

evidence in legal proceedings. There were no procedures in place to precisely identify the refrigerant intercepted, as the central laboratory had not been equipped or accredited for this purpose.

1474. The combination of relatively small number of customs officers trained to detect ODS, rarely used detection equipment, lack of knowledge by Customs of ODS legislation, few interceptions ODS and bribery of customs officers threatens Kazakhstan's ability to be effective in combating illegal trade in ODS.

8.6.4.3.4.2 Recovery, recycling, reclamation and destruction

1475. Based on the estimates of total number of personnel that work on refrigeration and air-conditioning equipment, it appears that about 70% have received training in courses delivered during the project. The number of technicians trained since the project has slowed considerably to only about 2% of the total. Failure to continue with the training programme risks more unqualified personnel becoming involved in commercial refrigeration management, leading to higher emissions of refrigerants.

1476. Suspension of the requirement for enterprises to register when using ODS, because of the economic crisis, may weaken the ability of the government to track and monitor the number of businesses becoming involved in ODS which, in turn, may lead to poor management of ODS refrigerants in the future and increased emissions.

1477. Although more than 800 mobile air-conditioning technicians were trained, there was only one garage in Astana (the capital) that we visited that recovered and reclaimed ODS from MACs. The servicing of MACs in 1998 consumed 110 ODP-tonnes per year, or 17% of the ODS consumption in the refrigeration sector. The training in this sector was expected to reduce ODS use by 9% per year. The government, by not enforcing the restrictions on emissions of ODS when servicing equipment, risks undermining the effort that has gone into the training to recover and store ODS.

1478. Unlike in some other CEIT countries, there is no Greencard system that is used by technicians to prove to potential clients that they are qualified and registered to work with refrigerants and refrigeration equipment. This system would be useful for encouraging clients to hire trained rather than 'independents'. There is no system in place to encourage training or re-training that would allow technicians to keep abreast of changes in new refrigerants and equipment, in order to ensure that environmental and occupational safety standards continue to be met.

1479. A Refrigeration Association in Kazakhstan had not been established, which could offer leadership on training and other issues. The lack of such an organisation increases the risk that the government will not be able to develop practical policies and activities related to the use of refrigerants.

8.6.4.3.4.3 Halon

1480. Although halon consumption has been reported as zero from 1 January 2003, the programme for collecting and safely storing halon has been in abeyance for at least 5 years, which increased the prospects for unintentional halon emissions.

8.6.4.3.4.4 Government commitment

1481. The government does not appear to be committed to implementing legislation in a timely manner, which increases the risk of Kazakhstan exceeding the control measures applicable to developed countries (see Impact on the phase out of ODS). The absence of legislation can lead to poor management of ODS refrigerants in the future and increased emissions

8.6.4.3.4.5 Methyl bromide

1482. Kazakhstan phased out methyl bromide in 2001, CTC in 2002 and halons in 2003. Although the consumption of methyl bromide was reported as zero for each year from 2001 to 2005, it was not sustainable as consumption resumed in 2006 when 19.8 ODP-tonnes were reported (similar consumption to 2000), which increased to 60 ODP-tonnes in 2007. The NOU advised that methyl bromide was being used to fumigate soil in glasshouses for the production of tomatoes, and in grain elevators. These uses are non-QPS and subject to phase out under the Montreal Protocol. Methyl bromide uses for QPS and non-QPS activities require clarification, followed by decisive

action by Kazakhstan to end the consumption of methyl bromide for non-QPS uses.

8.6.4.4 Catalytic role

1483. The key factors influencing catalytic action are *innovation, demonstration, replication and cooperation*. Often a single sub-project was a combination of each of these factors. Government policies, measures and action had a significant impact on the speed and extent of catalytic action. The private sector's involvement in projects and co-financing are crucial, as they have a demonstration and replication role as well as an impact on supplier companies supply funded enterprises with raw materials.

1484. The technician training and 3R sub-projects were expected to phase out about half of the targeted ODS in Kazakhstan. Many aspects of the establishment of the 3R operations in the CEITs were examples of *catalytic action by replication*, particularly the machines required for this operation, and the training on how to use them effectively. The ODS recycling and recovery machines were distributed to a network of refrigeration servicing organisations in Kazakhstan. Some companies that were not allocated the machines purchased their own, in order to undertake ODS recovery operations in the same way as their competitors that received the machines for free.

8.6.4.5 Achievement of outputs and activities

8.6.4.5.1 Delivered outputs for institutional strengthening

1485. The performance indicators[241] for the Institutional Strengthening sub-project were:

- Establishment of the National Ozone Unit;
- The facilitation of legislative measures for the phase-out of ozone-depleting substances;
- The design and implementation of awareness raising programmes on ozone-depleting substances;
- Facilitate / enable the collection of the required data on the use and consumption of ozone-depleting substances;
- Provide coordination and monitoring of an action plan to phase-out of ozone-depleting substances.

1486. Each of these is discussed in the following sections.

8.6.4.5.1.1 Establishment of the NOU

1487. About 2 years after the start of the Project, a National Ozone Office[242] (NOU) was established in the Climate Change Coordination Centre (CCCC)[243] in June 2002 as an agency independent of the Government. There is an agreement between the CCCC and the Ministry of Natural Resources and Environmental Protection (MNREP) approved by UNEP by which the CCCC implements this sub-project in Kazakhstan. The Vice-Minister of Environment Protection is a national coordinator of the project. The Director of the CCCC is the manager of the project. The NOU chief officer coordinates the activities within the NOU.

1488. The performance indicator that required the establishment of an NOU was assessed as delivered.

8.6.4.5.1.2 Legislation

1489. Legislation was developed by the NOU and submitted for approval by MNREP. The legislation, which is summarised in Table 43:

- Publicized the Montreal Protocol restrictions on trade in ODS and equipment[244];
- Restricted ODS activities associated with the repair, servicing and assembling of ODS

[241] Buxton, G.V. and R. Ciconkov. 2004. A Mid-Term Evaluation of UNEP's GEF-Sponsored Capacity Development and Institutional Strengthening Projects in Countries with Economies in Transition. Report prepared for UNEP-EO. 174pp. Page 176.

[242] Called NOU in this report to allow comparison with other CEITs, even though the acronym is NOO for National Ozone Office

[243] Decree of 13 June 2002. The CCCC is a NGO / consulting organization which is institutionally located outside of the government.

[244] Decree No 681, 10 July 2003.

equipment[245];

- Banned the import of Annex A, B & E substances and products that contain them[246];
- Required companies to have a licence to import/export ODS[247], and a simplified version of the same requirement published 3 July 2007; and
- Promulgated the permissible levels of ODS emissions from enterprises[248].

Table 43: Legislation in Kazakhstan regulating the production, consumption, export and import of ozone-depleting substances

Date	Number	Title and short description
November 1999	Decree No. 1716	• Introduced a legal system for regulation of ODS import and export
13 June 2002	Registry number	• Establishment of the Climate Change Coordination Centre
10 July 2003	Decree No. 681	"*On adoption of import and export prohibitions for transportation of goods and means of transport, the list of goods forbidden to be placed under certain customs regimes and also prohibitions and restrictions on carrying out operations with goods placed under certain customs regimes*" • Banned the import of some types of ODS
8 January 2004	Resolution No. 19	"*On Environmentally Dangerous Activities and their Obligatory Licensing*" • Licensing of ODS activities including the repair, assembling and servicing of ODS-containing equipment; • Import/export licensing of ODS and ODS-containing products. Import and export of ODS were added to the List of ecologically dangerous economic activities • Ban on the import of products containing ODS • Quotas limits for carbon tetrachloride, methyl chloroform and methyl bromide
22 June 2005	Decree No. 617	• Ban on the import of CFCs, halons, CTC and methyl chloroform. • This decree was replaced by Decree No 508 in 2007.
9 January 2007	Decree No. 212	"*Environmental Code*" • Introduced registration and control over ODS consumption.

1490. In general, the legislation has been approved by the government too slowly to fully support the reduction and phase out activities. For example, the Copenhagen and Beijing Amendments have not been ratified by the government. Both amendments bind countries to specific actions on methyl bromide and HCFCs. To some extent, Kazakhstan has compensated for this by already putting in place legislation that controls both ODS.

1491. Legislation in Kazakhstan required all companies operating with ODS to pay an "*ecological insurance*" (see Section 8.6.4.5.2.1.6: *Summary of comments from enterprises* on page 324), which deterred both the import and the use of these refrigerants by SMEs. The larger servicing companies reported it was affordable, whereas the smaller companies complained that its cost was too high.

1492. All companies were also required by legislation to submit a form annually to the MNREP on the type and quantity of ODS that they used or imported. Since 2004, the NOU maintained a database on the quantity of ODS installed in companies, and the quantities of ODS that each company had import/export. However, there were also no statistics provided to the evaluation team as a result of an analysis of the information submitted by companies. There were no inspections of the companies by environmental Inspectors to verify the reports received and to follow up on cases of non-compliance. The requirement for companies to have a permit when working with ODS was suspended recently, because the government did not want do discourage work during the current economic crisis.

[245] Resolution No 19. 8 January 2004.
[246] Decree No 617. 22 June 2005.
[247] Resolution No 19. 8 January 2004.
[248] Decree 350. 13 December 2007.

1493. The NOU in 2005 also prepared documentation for the ratification of the Copenhagen (1992) and Beijing Amendments (1999)[249]; prepared in 2009 documentation for HCFC quotas for effect after 2010; and prepared documentation that required companies to report on the ODS imports/exports to the Ministry and Customs Service. As of the date of this report none of this legislation has been adopted.

1494. The performance indicator that required legislative measures for the phase-out of ozone-depleting substances was assessed as delivered.

8.6.4.5.1.3 Awareness programmes

1495. Kazakhstan carried out Awareness Raising workshops in 2005 and 2006 that targeted at the general public and industry, which were reported by the newspapers, radio and TV. Contests were held on the Ozone Day, there were posters by children, and essays on ozone and climate change issues. A brochure was published called "Ozone Story". T-shirts, caps, and pens with UNEP and ozone-layer protection logos were distributed.

1496. As in many other countries, Kazakhstan undertook activities on Awareness Raising to shore up support from the public, government and business stakeholders for legislation and activities that would restrict and eventually phase out ODS. A baseline and performance indicators to measure the benefits of ODS reduction as a result of the awareness programme were never developed. These could have been, for example, before and after data on the number of ODS-free refrigerators bought by the general public, an increase in ODS refrigerators being sent for recycling, demand for information on the website (as number of hits) on ODS-free alternatives. Although it was therefore impossible to evaluate the impact of the awareness programme, we assessed that Kazakhstan had achieved this performance indicator because it had carried out an awareness raising programme.

1497. Training of technicians and customs officials was an integral component of the awareness programme.

8.6.4.5.1.3.1 Training of refrigeration and air-conditioning technicians

1498. Implied Performance Indicators for refrigeration and air-conditioning technician training[250]:

- Evidence of assistance provided to the Government of Kazakhstan to draft and implement Codes of Good Practice for this sub-sector;
- Evidence that refrigeration courses in technical schools now cover ozone layer protection and good practices are part of the curriculum;
- Evidence that local refrigeration technicians are able to service refrigeration equipment in a way that reduces losses by 20-30%;
- Evidence (where possible) that this project has lead to a reduction in ODS consumption;
- Evidence of manual of good practice in refrigeration was produced and distributed; and
- Evidence that a national system of certification for technicians is introduced.

1499. The specified Performance Indicators[251] for refrigeration and air-conditioning technician training:

- Training of 400 refrigeration technicians in Phase I by March 2002;
- Training of 2000 refrigeration technicians in Phase II by December 2003;
- Training of 100 MAC technicians in Phase I by March 2002;
- Training of 700 MAC technicians in Phase II by December 2003;
- Purchase of equipment for 1 training centre by January 2002;
- Inclusion of the training module in the training institution by July 2002;

---

[249] Ratification status of Kazakhstan, as at 10 May 2009. Kazakhstan ratified the Vienna Convention and Montreal Protocol on 26 August 1998, and the London Amendment on 26 July 2001.

[250] Buxton, G.V. and R. Ciconkov. 2004. A Mid-Term Evaluation of UNEP's GEF-Sponsored Capacity Development and Institutional Strengthening Projects in Countries with Economies in Transition. Report prepared for UNEP-EO. 174pp. Page 176.

[251] In Project Document for Kazakhstan

- Training of minimum 60 custom officers by June 2002;
- Purchase of identification equipment for the custom entry points by June 2002.

1500. Training of technicians was undertaken to improve the skills of refrigeration and air-conditioning technicians that repair, service and assemble ODS-dependent equipment.

1501. In 1999, the NOU estimated there were about 5,600 technicians that worked in 340 registered refrigeration service enterprises (RSEs)[252], covering domestic, commercial, industrial, transport (car, truck) and railway wagons. In the 3R sub-project, a total of 394 technicians were trained in 6 workshops in 2002 to 2003 in all the regional centres of Kazakhstan. A train-the-trainers programme was carried out 3-5 March 2003.

1502. In 2004, 2,160 specialists were trained from 355 companies, 4 NGOs, 5 Regional Environmental Protection Administrations, universities and the military. In 2004 and 2005, 811 specialists were trained in good practices in MAC domestic, industrial and automobile conditioners. Each trainee that passed the course received a Manual and a certificate. The total number trained in the 3R sub-project was therefore 3,365 personnel in 51 training sessions in all regions of the country, which exceeds the minimum number specified in the sub-contract of 3,200 technicians. Kazakhstan therefore has met and exceeded the number of technicians that should have received training in this sub-contract.

1503. The training centres provided documentation and examples of 3R equipment. Guidelines were published entitled "*Good Practices in Servicing Refrigeration and Air Conditioning Systems*". The NOU attempted to establish a Refrigeration Association, but this was unsuccessful because of rivalry between potential association leaders. One of the larger companies formed an association with some companies, but it was not considered representative of refrigeration enterprises in Kazakhstan.

1504. The refrigerant training syllabus was comprehensive and included retrofitting of refrigeration equipment, leak detection and prevention of emissions, typical failures in refrigeration, blends and alternative refrigerants, safety when working with refrigerants, recycling and recovery of refrigerants, licensing systems for import/export, storage and destruction of contaminated ODS, and guest lectures on the ozone layer from 3-4 invited experts. The course covered both theory and practice, with individual attention provided to each technician to ensure they knew how to use the recovery machines. Several companies commented positively on the course and appreciated the ability of technicians to be able to start work on recovering ODS as soon as they had completed the training (see comments in Section 8.6.4.5.2.1.3: *Polair refrigeration service centre* on page 323).

1505. Training has been ongoing almost every year after the Project finished, but with fewer trainees. The NOU reported that 60 technicians were trained in 2005, and then 12 or 13 in each year since 2006. None were trained in 2008. The KSRIEC in cooperation with the NOU expects to deliver a 4-day training course later in 2009 to technicians from 15 companies (fewer than expected because of the economic crisis). The fees paid by the students covered the trainers' costs, which indicated that the programme was sustainable.

1506. The NOU reported that about 1,800 technicians that worked on refrigeration and air-conditioning equipment were called '*independents'* and might not have completed a training course. The Taxation Department and the Ministry of Ecology were reported to "*pursue*" independents that advertise for work on refrigeration equipment without the necessary qualifications, as a result of informal advertisements placed in the street by independents. This suggested that the training programme was sustainable, albeit at a lower level. However, given the number of technicians that have yet to be trained (1,800), there is a need to continue the training with a budget allocated by the government of Kazakhstan.

1507. The use of the equipment was an integral part of the training, which is discussed in detail in the next sub-project in paragraphs 1606 to 1606.

8.6.4.5.1.3.2 Training of Customs officers

1508. Implied Performance indicators for Customs officer training:

[252] NECSR-MNREP. December 1999. Country Programme for the phase out of ODS. Table 2.7, page 20.

- Number of Custom officers trained;
- Evidence that the Custom officers now understand the ODS issue;
- Evidence that they are able to detect ODS containing equipment and identify the type of ODS using the equipment supplied;
- Evidence of production and distribution of an operations manuals (country handbook)
- Evidence of having made recommendations to adjust ODS regulations (regulatory framework) as required;
- Evidence of awareness of illegal trade and its adverse impacts (number of enforcement actions);
- Evidence that the Custom officers are able to implement national import and export licensing system;

1509. The specified Performance Indicators for Customs officers[253]:

- Training of minimum 60 custom officers by June 2002;
- Purchase of identification equipment for the custom entry points by June 2002.

1510. In 2003, 61 Customs officers were trained in two courses[254] on the different types of ODS and equipment packaging and hazardous chemicals, which exceeds the minimum number specified in the sub-contract of 60 customs officers. Equipment for identifying ozone-depleting substances was purchased by Kazakhstan, and the limitations in their use were discussed in Section 8.6.4.3.4.1 *Illegal trade* on page 315. Kazakhstan therefore has met and exceeded the number of Customs officers that should have received training in this sub-contract.

8.6.4.5.1.4 Data collection on ODS consumption

1511. In regard to Data Reporting, the government of Kazakhstan has submitted reports to the Ozone Secretariat each year from 1989 to 2007[255], which indicated that Kazakhstan had achieved this performance indicator. The quality of the data reports was not able to be determined as the assessors did not have access to the information submitted to the Ozone Secretariat.

8.6.4.5.1.5 Action plan to phase-out ODs

1512. The objectives of the phase out of ODS in the Project were partially met as 564 ODP-tonnes were eliminated during the 4-years of the Project, compared to the target of 679 ODP-tonnes. The assessment team were not made aware of a formalised action plan to phase out ODS.

1513. Kazakhstan failed to comply with the Montreal Protocol's benchmarks of zero consumption of CFCs by 1 January 2004, as Kazakhstan reported 11.2 ODP-tonnes of CFCs consumed during that year. The benchmarks provided by the Montreal Protocol provided Kazakhstan with an additional 8-9 years to phase out CFCs and halon beyond the year of compliance for developed countries.

1514. From 2005 onwards the reports submitted by Kazakhstan to the Ozone Secretariat have shown that Kazakhstan has remained in compliance with Annex A (Group I and II), B (Group I, II, and III), C (Group II) substances, but not Group E (methyl bromide). Kazakhstan reported consumption of methyl bromide of 19.8 ODP-tonnes in 2006 and 60 ODP-tonnes in 2007, when there should have been zero consumption from 1 January 2005.

1515. The funding by the GEF for institutional strengthening has not resulted in an institutional structure that is fully responsive to the requirements of the Montreal Protocol. After the end of the Project, Kazakhstan continued to report consumption of other ODS in excess of the quantities permitted by the Montreal Protocol for developed countries. Kazakhstan reported increasing consumption of HCFCs that exceeded the permitted levels in the Montreal Protocol for developed countries in each year from 2004 to 2007. However, although consumption is in excess of levels permitted for developed countries, Kazakhstan is remains in compliance with the Montreal Protocol as the country has yet to ratify the Copenhagen and Beijing Amendments which bind Parties to comply with the control measures established for methyl bromide and

[253] In the Project Document for Kazakhstan
[254] Astana 3-5 March 2003; Almaty 22-24 December 2003.
[255] Ozone Secretariat Data Reporting Centre, as of 8 June 2009.

HCFCs in these Amendments.

1516. Delays in compliance and difficulties in achieving consumption levels applicable to developed countries in the Montreal Protocol appeared to be mainly due to delays adopting legislation relevant to controlling ODS in Kazakhstan.

8.6.4.5.2 Awareness about ODS, ODS substitute technology, and strengthening of institutional capacities for dealing with ODS phase-out

1517. Kazakhstan carried out Awareness Raising workshops in 2005 and 2006 that targeted at the general public and industry, which were reported by the newspapers, radio and TV. Contests were held on the Ozone Day, there were posters by children, and essays on ozone and climate change issues. A brochure was published called "*Ozone Story*". T-shirts, caps, and pens with UNEP and ozone-layer protection logos were distributed.

1518. Advice on ODS substitute technology was provided to enterprises. The NOU also organizes regional meetings with representatives of the refrigeration and air conditioning sector to discuss non-ODS refrigerants. The NOU disseminates information about new refrigerants usually from the UNEP and TEAP publications. The NOU also organizes seminars and consultations with consumers and distributors of ODS and equipment in the regions (within the country). The ozone officers were well known by the representatives of the enterprises that we visited for discussions on the value of the training of technicians and their experiences in reducing and phasing out ODS. The ozone office exchanges information on the implementation of ozone projects, with Kyrgyzstan and Turkmenistan.

1519. The NOU *engaged in partnerships with stakeholders* in the industrial and public sectors to implement its strategy of ozone layer protection through extensive awareness raising, technical training and legislative activities. The NOU promoted the use of non-ODS substances and technologies. New suppliers of substances were needed from new suppliers that were typically not in the Russian Federation. A refrigeration association does not exist in Kazakhstan which was assessed as a major partner that could assist with the delivery of ODS activities after the projects are completed.

1520. The NOU cooperated with the Kazakhstan Scientific and Research Institute of Ecology and Climate (KSRIEC), even though this Institute competes for the same contractual work as the NOU. Work in the future on the phase out of HCFCs may be contracted to this Institute, with a sub-contract to CCCC. The Institute also undertakes training of technicians, in cooperation with the NOU. A range of institutions have delivered training courses, including Pavlodar, Semipalatinsk and South-Kazakhstan state universities; Kazakh transport and communications academy; Almaty transport and communications college; accounting-technological college; and Taraz polytechnic college. In this way, the NOU has strengthened the institutional capacity to respond to training requirements.

1521. The refrigerant recovery and recycling programme, and the training of technicians, were discussed with five companies that received the refrigerant recovery and recycling equipment in order to obtain their views on the value of these activities. The companies that were interviewed were: Oasis, Combitech, Polair, Torgtekhnika and Auto Klimat in Kazakhstan.

8.6.4.5.2.1.1 Oasis refrigeration equipment retailer

1522. Oasis Ltd was established in 1993 and assembles and sells refrigeration equipment such as over-shelf counters, ice-cream freezer chests, vertical cabinets and quick-freeze cabinets. It has shops in 6 cities in Kazakhstan with 5-10 refrigeration technicians in each. Oasis stated that it was satisfied with the training that had been provided to technicians, especially the practical aspects. New technicians that joined the company were sent on the first available course.

1523. Oasis was provided with 5 recovery units and one reclamation machine. They were used in 2003 but little recently as there are no CFCs and HCFCs were relatively new, so there was no reason to use them. There was no requirement to submit reports since the sub-project had been completed, so there were no data on the amounts recovered and reclaimed. Spare parts were available and he was satisfied with the operation of the 3R equipment.

1524. The switch from CFC-12 to HCFC to 404A systems was driven by equipment that was now imported from Europe, whereas in the past Russia was the source of CFC-based equipment.

Many small shops with CFC refrigerators had been replaced by supermarkets with 404A systems, most imported from Germany. Customers were prepared to pay more than twice the price[256] of an HCFC-22 system for 404A as they were aware of the negative publicity surrounding the use of CFCs and the requirement to adopt new refrigerants. Demand for equipment was much less during the economic crisis, compared to more than 100 display cabinets per month in better economic times. Oasis paid the 'ecological insurance' to use the HCFCs, which was not considered particularly expensive when spread over the costs of all the shops in the chain.

Figure 26: Smaller cylinders and equipment (blue) used for ODS recovery and storage (left) with unused large tank (right). Polair, Kazakhstan.

8.6.4.5.2.1.2 Combitech refrigeration service centre

1525. Combitech is a refrigeration servicing centre that was provided with 5 recovery units and one reclamation machine. Combitech was satisfied with the training of technicians. The 3R equipment reduced the need to purchase about 90% of the CFCs as only 20 cylinders were purchased per year instead of 200, which increased profitability. Combitech intended to recover HCFCs in the future, as the 'ecological insurance' of 500,000 tenge (about $3300 per annum) was steep, but did not apply to recycled HCFC-22. They had been unable to find spare parts for one of the recovery machines[257]. They had accumulated about 120 kg of contaminated ODS as a result of the 3R operation, which was a problem as destruction was not available in Kazakhstan.

8.6.4.5.2.1.3 Polair refrigeration service centre

1526. Polair is a refrigeration servicing centre that has 12 technicians. Polair received 12 recovery machines, 8 of them remained in Almaty and the others were sent to Polair shops in other cities. Two of the recovery machines were lost when they were sent to be repaired in Almaty, as the repair company went bankrupt. The company was satisfied with the training, and in particular the individual attention given to each of the trainees by the trainers to ensure that each trainee knew how to operate the 3R equipment. They were sometimes not able to recover the CFCs as they had leaked from the equipment, or the customer equipment had been serviced by a 'person off the street' (unqualified). At that time there were no regulations requiring qualifications.

1527. The company had stored blends of refrigerants that were not able to be recycled as the percentage composition of the blend altered when in use. Polair had limited storage space and preferred the small cylinders for ODS as the large one was too difficult to move (Figure 26). Unusable ODS was storage problem.

1528. Polair was recently fined for working with HCFC-22 without 'ecological insurance'. The company was asked to pay 1 million tenge ($6600 per annum) in 'ecological insurance' to continue the use HCFC-22, which was a large increase from 120 tenge 2 years previously. Polair intended to switch to other refrigerants rather than make the payment.

1529. Polair believed that CFC-12 was still being imported from Russia and China, and that such imports were becoming less necessary since about 50% of the equipment in Kazakhstan operated on HCFC-22. Customs were unable to distinguish between R404A (allow import) but not HCFC-22 (reject import), because their training was insufficient.

[256] 2020 tenge for 404A vs 900 tenge for HCFC-22 system. $1 = 150 tenge (May 2009)
[257] Yokogawa GA500 refrigerant gas analyser

8.6.4.5.2.1.4 Torgtekhnika refrigeration servicing centre

1530. Torgtekhnika is a refrigeration servicing centre that used to have 120 refrigeration technicians in the past, but now had just five. The company received one recovery machine, which was still in the box unused. Torgtekhnika said that the ban on the import of CFCs effectively ended the potential to recover and recycle CFCs, the 'ecological insurance' to work on CFCs was dissuasive, and most importantly, the recovery machine arrived too late as most of the CFCs had already gone. The company received the equipment after the director had attended a training course. The company planned to sell the machine to another company so that it could be used.

Figure 27: ODS recovery equipment from mobile air conditioning. Auto Klimat, Kazakhstan**.**

8.6.4.5.2.1.5 Auto Klimat car air conditioning service

1531. Auto Klimat was reported to be the only garage in Astana that recovered and replaced ODS in mobile air-conditioning (MAC) systems (Figure 27). The owner had several national awards for his services that benefit the environment. He received one recovery and reclamation machine from the project, and he invested in one more. He said that the other garages in Astana vented the ODS when servicing MAC units. Recovering the gas was profitable for him and the environment, as it saved about 60-70 kg per year from being emitted. He did not top up CFC MAC units because he did not want to pay the 'ecological insurance' when using CFCs, but instead retrofitted them with HFC-134a.

1532. He had salvaged some very large unused cylinders from another refrigeration service centre in the 3R project to store about 280 litres or 70 kg of contaminated ODS in his garage. This was a problem as storage space in his garage was very limited. He was not aware of any destruction facility and wanted a solution to be available for the waste ODS.

8.6.4.5.2.1.6 Summary of comments from enterprises

1533. The companies involved in the recovery and recycling of ODS and in the training of technicians viewed both as successful. The servicing companies generally valued the training that had been provided to technicians to improve their skills in refrigerant handling.

8.6.4.5.3 Authority / credibility, necessary to influence policy and decision-makers

1534. The NOU has limited authority / credibility necessary to influence policy and decision-makers as important legislation necessary to protect the ozone layer, and to encourage ongoing ODS recovery and recycling operations, have not been put in place.

1535. On the other hand, the NOU had significant authority / credibility with enterprises as it helped them to establish ODS recovery and recycling programmes and distributed equipment to them. However, the success of the programme was not able to be measured because data were not available on the amount that had been recovered, recycled and destroyed.

8.6.4.6 Assessment of monitoring and evaluation systems

8.6.4.6.1 Monitoring and evaluation design

1536. This project was designed to raise awareness of the phenomenon of ozone depletion; to encourage the use of ODS substitute technology; to strengthen institutional infrastructure to deal with ODS phase-out; to implement procedures to meet and exceed the Montreal Protocol phase-out schedule; and to enable the Government of Kazakhstan to phase out all consumption of ODS by 2003.

1537. UNEP's monitoring and evaluation design for this sub-project consisted mainly of recording the number of legislative measures, activities undertaken and items distributed in the awareness campaign, and personnel (technicians / customs officers) that were trained in each reporting

period. UNEP relied on the report of the Protocol's Implementation Committee to determine if the Party had not complied with the ODS reduction requirements agreed by the Parties, which in turn was based on report to the Ozone Secretariat submitted by Kazakhstan.

1538. UNEP acknowledged that the training sub-project contained poor design and performance indicators that tended to focus mainly on quantitative reporting rather than qualitative feedback. Risk Analysis was also not a part of project design which made it difficult to predict the sustainability of projects after the funding ceased. UNEP considered it would have been useful, for example, to have included a peer review of the national curricula related to refrigeration technician and Customs officer training, which would have added an important qualitative element to the project monitoring and evaluation design.

1539. The assessment team agrees with UNEP's acknowledgment of the limitations of the monitoring and evaluation design. The most important outcome or Performance Indicators were not developed, such as a reduction in ODS consumption as a result of the training of refrigeration technicians, or the quantity of illegal ODS intercepted by Customs officers as a result of their training. SMART indicators and data analysis systems were not used. A baseline, performance indicators and reporting system for these indicators was not part of the design, and therefore the success of the training sub-project could not be adequately measured.

1540. For these reasons, the assessors that completed the UNEP "Mid-Term Evaluation" and now this "Terminal Evaluation" have used implied Performance Indicators when making these assessments. These are shown for Institutional Strengthening in paragraph 1485 above, and for technician training in paragraphs 1498 and 1499 above.

8.6.4.6.2 Monitoring and evaluation plan implementation

1541. Some risk analysis was undertaken by UNEP but this was not always fully completed with follow up areas were implementation was regarded to be at risk, such as the delay in implementation of the sub-project. UNEP in 2005 characterised Kazakhstan's management of the Project as low risk in all aspects: Management structure, work flow, implementation, budget, fund management, stakeholder involvement, communication, leadership, short term / long term balance (for sustainability and replication), science and technological issues (follows TEAP closely), and political influence (full political support and engagement); and medium risk for Reporting and for Social, Cultural and Economic factors.

1542. One of the reasons for the original funding for Institutional Strengthening was in response to concerns raised in the Implementation Committee and Meeting of the Parties to the Montreal Protocol regarding the difficulty of a number of CEITs in meeting their reporting obligations. The GEF then mobilized modest resources under GEF-3 to support capacity building, including improvements to reporting on the phase out of ODS. Despite this focus on reporting, there was no information on further action that was taken by UNEP in this sub-project, in collaboration with Kazakhstan, to make specific improvements to the reporting procedures.

1543. There was no evidence of adaptive risk management by UNEP. The NOU did not mention training in Monitoring and Evaluation activities when interviewed and therefore the assessment team assumes that this did not take place.

8.6.4.6.3 Budgeting and Funding for monitoring and evaluation activities

1544. The evaluation team focused on the outcomes of the projects rather than the detail of the financial expenditure. In general, the NOU coordinator prepared the financial plan in coordination with the NOU accountant, which was then approved by the chairman of the SCNP. Quarterly financial reports were submitted to UNEP, sometimes with a delay due to translation from Russian to English.

8.6.4.6.4 Long-term monitoring

1545. Article 7 "Reporting of data" mandates Parties to the Montreal Protocol to report by 30 September each year on their consumption and production of ODS in the previous year. Decision XV/15 in 2003 encouraged Parties to forward data on consumption and production to the Secretariat as soon as the figures became available, and preferably by 30 June each year, rather than 30 September in order to facilitate the work of the Implementation Committee. The

Secretariat reported recently that most Parties are able to comply with the June requirement.

1546. Data reporting on consumption is the most important action on long-term monitoring and a 'litmus test' of progress in the phase out of ODS and the sustainability of the phase out. The Implementation Committee has not remarked on any aspects of data reporting by Kazakhstan, which suggest that reporting has been timely and accurate.

1547. Data reporting, and the infrastructure necessary for this, is expected to continue as this is a mandatory annual requirement in the Montreal Protocol. The assessors note that reporting by Kazakhstan continued even during the 3 year period when Institutional Strengthening funding was not available, which suggests that the CCCC and the government of Kazakhstan regard reporting as a priority. This indicated a level of sustainability for reporting even when UNEP funds were not available.

8.6.4.7 Assessment of processes that affected attainment of project results

8.6.4.7.1 Preparation and readiness

1548. Kazakhstan introduced a range of legislative measures in preparation for the work to reduce and phase out ODS in this sub-project, which was operational from October 2001 to December 2006. Many of these measures were adopted later than intended due to delays in reviewing the documents and passage through the legislative procedures.

1549. In November 1999, Decree No. 1716 introduced a legal system for regulation of ODS import and export. On 13 June 2002, legislation was adopted that established the Climate Change Coordination Centre. On 10 July 2003, Decree No. 681 came into force that banned the import of some types of ODS entitled "*On adoption of import and export prohibitions for transportation of goods and means of transport, the list of goods forbidden to be placed under certain customs regimes and also prohibitions and restrictions on carrying out operations with goods placed under certain customs regimes*". On 8 January 2004, Resolution No. 19 "*On Environmentally Dangerous Activities and their Obligatory Licensing*" established licensing of ODS activities including the repair, assembling and servicing of ODS-containing equipment; and restricted the import/export licensing of ODS and ODS-containing products. Import and export of ODS were added to the List of ecologically dangerous economic activities. Imported products containing ODS were banned and quotas were established for carbon tetrachloride, methyl chloroform and methyl bromide. All companies were required by legislation to submit a form annually to the MNREP on the type and quantity of ODS that they used or imported. Since 2004, the NOU maintained a database on the quantity of ODS installed in companies, and the quantities of ODS that each company had import/export. On 22 June 2005, Decree No. 617 Banned the import of CFCs, halons, CTC and methyl chloroform.

1550. The NOU in cooperation with the MNREP submitted the proposal on acceding to the Copenhagen and Montreal Amendments. The NOU has prepared the documents for acceding to the Beijing Amendment as well.

1551. For the training component of the sub-project, CCCC prepared certification schemes for refrigeration engineers and technicians, the training module in collaboration with the technical educational institutions, the Russian version of 1994 UNEP Handbook on "*Good Practices in Refrigeration*".

1552. To promote industry and public support for the training, Kazakhstan engaged in many activities to improve knowledge on the causes and remedies for ozone depletion, and the consequences of inaction. Amongst the most important of these was the establishment of a website[258] that included detailed information on ozone layer depletion, the workshops and other activities that were underway to reduce and eliminate ODS; presentations and discussions on the radio and TV on ozone layer depletion; a booklet on ozone protection and activities; and articles in the print media and scientific magazines.

1553. Collectively these activities indicated that Kazakhstan had legislative, educational and awareness raising activities that were rolled out in preparation for, and in support of, the sub-project activities. Some of these activities started before the sub-project commenced, but the majority

[258] http://www.climate.kz/eng/?m=list&id=1

of them were ongoing during the work on this sub-project.

8.6.4.7.2 Country commitment and motivation

1554. A relatively large NOU of six staff within the independent CCCC was able to allocate about 30% of its activities to ozone layer protection. The funding for the NOU originated entirely from international donors and successful bids for contracts to undertake work for companies and national organisations. The government, while not providing any funding from the central budget, provided strong political support for the CCCC. Indeed, within the CCCC the NOU is well connected to other departments and organisations that facilitated its work on ozone layer protection. The risk of this level of commitment changing in the near future is low.

1555. The government is motivated toward ozone layer protection, but it falls short of translating this motivation into action that effectively protects the ozone layer. Adoption of ozone layer protection legislation is continually delayed. These delays have resulted in Kazakhstan missing the ODS reduction and phase out targets in the control measures applicable to developed countries under the Montreal Protocol.

1556. Similarly, on Customs training the government states that it is committed and motivated but this has not been translated into effective action. For example, only 61 out of 5000 Customs officers have attended the training courses and have been issued with ODS detection equipment, which is less than 1.5% of all the officers in the Agency. It would be challenging for Kazakhstan to intercept ODS at its very long border line with so few officers trained.

8.6.4.7.3 Stakeholder involvement

1557. The CCCC coordinates its activities on ODS with a range of stakeholders including the MNREP, the Ministry of Economy and Trade, the Ministry of Foreign Affairs, the Ministry of Agriculture, the Ministry of Energy and Natural Resources, the Ministry of Transport and Communication, the Ministry of Justice, the Ministry of Finance, the Agency on Strategic Planning, the Ministry of Defence, the Ministry of State Revenue, and the Agency on Emergency Situations. Representatives of these organisations are mostly in Almaty and Astana, but also in other regions of Kazakhstan such as Pavlodar where the NOU undertakes activities.

1558. The CCCC also has a range of training facilities and organisations as stakeholders, including Kazakhstan Scientific and Research Institute of Ecology and Climate; the Customs Agency; Pavlodar, Semipalatinsk and South-Kazakhstan state universities; Kazakh transport and communications academy; Almaty transport and communications college; accounting-technological college; and Taraz polytechnic college.

1559. The NOU was assessed as having successfully engaged stakeholders from a diverse range of organisations that had helped it to carry out the legislative changes, awareness raising and training activities described above.

8.6.4.7.4 Financial planning

1560. The NOU remained within the allocated budget for the training programmes, and reported regularly on the drawdown on this budget to UNEP.

1561. Kazakhstan was the first of four CEITs to receive an extension of funding for Institutional Strengthening, after this first Institutional Strengthening project was completed. Kazakhstan received the first Institutional Strengthening funding from UNEP for the period 2002 until 2005. The extension to the term was approved by the GEF in 2006. Funding commenced in December 2008. UNEP-DTIE in Paris was not able to explain the reason for the 2.5 year delay between funding approval and disbursement, and advised that all financial issues were covered by UNEP in Nairobi. The NOU was dependent on other additional sources of revenue in the period between UNEP funding.

8.6.4.7.5 UNEP / UNDP supervision and support

1562. The NOU described the financial supervision and support provided by UNEP. UNEP provided an action plan and a budget line for each item, which was refined by an exchange of emails until both parties agreed that the budget was acceptable. UNEP allowed some flexibility between line items in the budget as the NOU was permitted to move funds between line items as long as the overall sub-project remained within the total allocated. The NOU appreciated this supervision

and support which helped to make the budget practical to implement. The expenditure each year was externally audited as this was a UNEP requirement.

1563. UNEP-DTIE also provided financial planning assistance and some countries were invited to Paris to participate. However, Kazakhstan was not invited to one of the planning sessions, even though they reported that they would have accepted as they felt they would have benefitted from the assistance. Kazakhstan attended later sessions which were helpful for taking the correct action to write down outdated office equipment.

1564. In general the NOU said that they were satisfied with the financial assistance and advice on the budget. They were however, dissatisfied with the 2.5 year delay between Institutional Strengthening projects, and considered this to be an example of poor financial support by UNEP.

8.6.4.7.6 Co-financing and project outcomes & sustainability

1565. In this sub-project there was 9.5% co-financing by the government of Kazakhstan. However, there was a delay of several years[259] between the first and second Institutional Strengthening projects of about 2.5 years when in-kind resources (working hours, office space and equipment) were supplied by the CCCC. The precise amount of in-kind financing was not recorded. The loss of one source of funding for a prolonged period did not result in closure of the NOU because it depends on multiple sources of funding for its operation, and in this sense there is sustainability beyond the funding period of the project.

1566. This 2.5 year gap in funding demonstrated that the lack of funds for this period did not result in closure of the CCCC, and hence their operations were assessed as sustainable. The sustainability of the CCCC could be attributable to multiple sources of funds, so when one source such as UNEP is delayed it does not result in a closure of the CCCC.

8.6.4.7.7 Project implementation delays and impact on project outcomes & sustainability

1567. As a result of the quarterly reviews reports, UNEP identified delays at the start of the sub-project due difficulties in the adoption of legislation and in identifying organisations for the training. However, once the legislation was adopted and the training organisations identified, the project was completed over a 4-year period (January 2002 to December 2006), rather than 3-years as originally intended.

1568. These delays are unlikely to have affected the sustainability of the training project, as the lack of sustainability is more related to the lack of legislation that requires training and other factors, rather than to the lack of funding per se.

1569. Based on the estimates of total number of personnel that work on refrigeration and air-conditioning equipment, it appears that about 70% have received training in courses delivered during the term of the sub-project. Since the project ended, the number of technicians trained has slowed considerably to only about 2% of the total. Failure to continue with the training program risks more unqualified personnel becoming involved in commercial refrigeration management, leading to higher emissions of refrigerants.

1570. Suspension of the requirement for enterprises to register when using ODS, because of the economic crisis, may weaken the ability of the government to track and monitor the number of businesses becoming involved in ODS which, in turn, may lead to poor management of ODS refrigerants and increased emissions.

1571. Although more than 800 mobile air-conditioning technicians were trained, there was only one garage in Astana (the new capital) that we visited that recovered and reclaimed ODS from MACs. The servicing of MACs in 1998 consumed 110 ODP-tonnes per year, or 17% of the ODS consumption in the refrigeration sector. The training in this sector was expected to reduce ODS use by 9% per year. The government, by not enforcing the restrictions on emissions of ODS when servicing equipment, risks undermining the effort that has gone into the training to recover and store ODS.

1572. Unlike in some other CEIT countries, there is no Greencard system that is used by technicians to

[259] At the 16th Meeting of the Parties to the Montreal Protocol in November 2004, the GEF recognized the need for further assistance to CEITs, and pledged continued assistance through GEF IV to the Parties of the Montreal Protocol. An umbrella IS renewal project (covering Azerbaijan, Kazakhstan, Tajikistan and Uzbekistan) was developed in 2005, and was approved by the GEF CEO for Council consideration in August, 2006. Disbursement of funds for IS to these countries began in 2009.

prove to potential customers that they are qualified and registered to work with refrigerants and refrigeration equipment. This system would be useful for encouraging the customers to hire trained rather than 'independents'. There is no system in place to encourage training or re-training that .would allow technicians to keep abreast of changes in new refrigerants and equipment, in order to ensure that environmental and occupational safety standards continue to be met.

1573. An Association of Refrigeration in Kazakhstan was not present to offer leadership on training and other issues. The lack of such an organisation increases the risk that the government will not be able to develop practical policies and activities related to the use of refrigerants.

8.6.4.8 Sub-project rating

GF/4040-01-13 Programme for Phasing Out ODS - Merged Institutional Strengthening and training of trainers for use of ODS-free refrigerants including training of custom officers (UNEP)		
Criterion	**Evaluator's Summary Comments**	**Evaluator's Rating**
Attainment of project objectives and results Sub criteria (in yellow below)	See comments below	S
Effectiveness	The number of technicians and customs officers trained exceeded the number specified in the contract. However, institutional strengthening was not sufficient to fully meet the agreed ODS scheduled phase out	S
Relevance	Legislation to promote the reduction and phase out of ODS, and training of technicians in best practice use of ODS, is consistent the Montreal Protocol. The legislation, however, was adopted relatively late	S
Efficiency	A relatively small team in the NOU leveraged national resources to coordinate the training of technicians and customs officres cost-effective and timely manner	S
Sustainability of Project outcomes (overall rating) Sub criteria (in yellow below)	See comments below	S
Financial	Delivered within budget. NOU activities depend on multiple funding streams which has shown to promote NOU sustainability	S
Socio-Political	International commitments were accepted not fully met mainly due to lack of full government commitment to ozone layer protection and timely adoption of legislation	S
Institutional framework and governance	Strong support for the NOU from the government and a reasonably robust institutional arrangements	S
Environmental	Illegal trade, halon emissions, lack of training	S

GF/4040-01-13 Programme for Phasing Out ODS - Merged Institutional Strengthening and training of trainers for use of ODS-free refrigerants including training of custom officers (UNEP)		
Criterion	**Evaluator's Summary Comments**	**Evaluator's Rating**
	and the use of methyl bromide threaten to undermine the progress so far	
Achievement of outputs and activities	The number of technicians and customs officers trained exceeded the number specified in the contract.	HS
Monitoring and Evaluation (overall rating) Sub criteria (in yellow below)	See below	
M&E Design	Poor design and performance indicators that tended to focus mainly on quantitative reporting rather than qualitative feedback	MS
M&E Plan Implementation (use for adaptive management)	There was little evidence of adaptive management	S
Budgeting and Funding for M&E activities	Not determinable from the documentation provided	
Catalytic Role	No categorisation required	
Preparation and readiness	Enabling legislation delayed and initial difficulties with identification of organisations to deliver the training	S
Country commitment and motivation*	Kazakhstan is committed and motivated but poor delivery after the end of the project results in ongoing challenges to ozone layer protection	S
Stakeholders' involvement	The project involved the relevant stakeholders and made use of the skills, experience and knowledge of key national and international organisations	S
Financial planning	UNEP facilitated reporting on expenditure and remaining within the budget allocated	S
UNEP supervision and support**	Discontinuity of funding by UNEP put a risk the IS project. This risk was eliminated by continued work by the NOU despite the lack of funding for a prolonged period	S
Overall Rating		S

Highly Satisfactory (HS); Satisfactory (S); Moderately Satisfactory (MS); Moderately Unsatisfactory (MU); Unsatisfactory (U); Highly Unsatisfactory (HU);
*Motivation replaced TOR '*driveness*'; **Support replaced TOR 'backshopping'

8.6.5 KAZ/00/G31 National programme for the recovery and recycling of ODS refrigerants (UNDP/UNOPS)

8.6.5.1 Introduction

1574. The Refrigerant Management Plan proposed to phase out ODS by focusing on the training of refrigeration technicians and to introduce a National Recovery and Recycling of Refrigerants Programme. The Programme aimed to supply major ODS users and service shops with ODS recovery and recycling equipment to be used during the service, conversion and disposal of refrigeration and air-conditioning equipment. The supply of the equipment was preceded by training in best practice for charging, handling and containing ODS in order to avoid ODS emissions, and thereby to conserve ODS for servicing of this equipment. The training aspects were assessed above, whereas the impact of the Recovery and Recycling Programme is assessed below.

1575. Project implementation commenced in August 2001 and ended in 2006.

8.6.5.2 Attainment of objectives and planned results

8.6.5.2.1 Effectiveness

1576. There were no specific achievement or performance indicators that were developed for this project. Effectiveness could be evaluated by assessing:

- The quantity of equipment supplied for recovery and recycling of ODS;
- The number of servicing enterprises and servicing centres that received the equipment;
- Training of technicians in best-practice ODS recovery and recycling;
- The amount of ODS recovered, recycled and destroyed as a result of the sub-project.

1577. The achievement of outputs and activities by Kazakhstan in this sub-project on recovery and recycling of ODS, as measured against these performance indicators, are provided in Section 8.6.5.5.1 "*Delivered outputs*" on page 334.

8.6.5.2.2 Relevance

1578. The recovery and recycling programme was relevant because it reduced the need for production of virgin CFCs for servicing of existing equipment, and it reduced emissions of existing CFCs. This was achieved specifically by :

- Recovering refrigerant before retrofitting or dismantling and scrapping operations;
- Creating the infrastructure within the country for the collection, recycling and distribution of all CFCs;
- Encouraging the service workshops and companies to maintain their own systems and/or equipment, as they do not have to purchase the CFCs which was a financial incentive;
- Reducing the consumption of CFC-12 due to improved maintenance procedures; and
- Reducing the consumption of about 360 tonnes of CFC-12 that would otherwise have been purchased.

1579. More generally, the recovery and recycling of ODS in Kazakhstan was also consistent with the objectives of the Vienna Convention and the Montreal Protocol, which *requires Parties to take appropriate measures in accordance with the provisions of this Convention and of those Protocols in force to which they are party to protect human health and the environment against adverse effects resulting or likely to result from human activities which modify or are likely to modify the ozone layer*[260].

1580. The GEF established in 1995 an Ozone Layer Depletion Focal Area in response to the Montreal Protocol. The Focal Area has the strategic objective of protecting human health and the environment by assisting countries to phase out their consumption and production of ODS, to prevent emissions of ODS, and to encourage the uptake of alternative technologies and practices

[260] Handbook for the Vienna Convention for the Protection of the Ozone Layer - 7th Edition (2006). Article 2: General Obligations.

according to a country's commitments under the Montreal Protocol. The financial interventions in the GEF Focal Area contribute to the return of the ozone layer to pre-1980 ozone levels, which is expected by 2065.

1581. Most recently, the dual capability of ODS to both reduce ozone and to have a detrimental impact on the climate have been described[261]. Global ODS consumption in 1989 was equivalent to about 9,200 million tonnes (9 Gt) CO_2-eq/year, which was reduced to about 1,870 million tonnes (1.8 Gt) CO_2-eq/year in 2007 as a result of ODS phase-out activities under the Montreal Protocol. This reduction of about 7 Gt CO_2-eq/year was at least three times greater than the Kyoto Protocol's reduction target (about 1-2 Gt CO_2-eq/year in 2008-2012), demonstrating that the global ODS reductions achieved so far have already yielded a larger climate benefit than the current Kyoto Protocol target.

1582. The actions taken by Kazakhstan to recover and recycle ODS was therefore relevant to further protection of the ozone layer (Montreal Protocol) and relevant to reducing the impact of radiative forcing of the climate (Kyoto Protocol).

8.6.5.2.3 Efficiency

1583. The cost-effectiveness of the programme was assessed in the Project Proposal as $6.60 / ODP-kg per year, on the basis of an incremental cost of $2,356,684 and a reduction of 357.21 ODP-tonnes of CFCs per year.

1584. At the end of the project, it was not possible to verify this cost-effectiveness because the quantity of CFCs collected per year was not reported by Kazakhstan. Although reporting by companies was a condition of receiving the equipment, the NOU reported that it had not seen the results from the 3R reports that were sent to the Environmental Research Institute for collation and analysis of the ODS recovered, recycled and reclaimed by the servicing companies.

8.6.5.3 Assessment of sustainability of project outcomes

8.6.5.3.1 Financial resources

1585. The companies interviewed were generally positive about the value of the recovery and recycling programme, as it saved the cost of purchasing CFCs. As the recovered CFCs in effect paid for the programme, the cost of CFC recovery and recycling depended on consumer (client) finance rather than government finance. Therefore, when examined on a financial basis, the project was assessed as sustainable, but there are other factors which are discussed below that reduce its sustainability.

1586. Some companies reported that spare parts were either not available or when available they were very expensive (see company reports in Section 8.6.4.5.2 on page 322). The lack of the ability to purchase spare parts reduced the sustainability of the sub-project.

8.6.5.3.2 Socio-political

1587. Many servicing companies that the assessment team visited commented that the programme was initiated too late as most of the CFCs had already been emitted by the time the programme had started. Reduced quantities of CFCs resulted in less effort being put into their recovery and recycling, which reduced the prospects for sustainability of the recovery and recycling programme.

8.6.5.3.3 Institutional framework and governance

1588. In return for receiving the equipment, the servicing companies were required to report on the amount of refrigerant recovered, recycled and reclaimed. However, no legislation had been put in place that mandated all companies to report annually to the Ministry of Environment (MoE) on the amounts recovered, recycled, reclaimed and destroyed. The NOU reported that only about 30% of the 700 users of 3R equipment actually submitted reports to the NOU on ODS that had been recovered and recycled. Reports were not received from those that did not have access to fax or email. Poor institutional framework and governance were assessed as reducing

[261] Velders, J.M., Andersen, S.O., Daniel, J.S., Fahey, D.W. and M. McFarland. 2007. The Importance of the Montreal Protocol in protecting climate. http://www.pnas.org/content/104/12/4814.abstract

the prospects of sustainability of the recovery and recycling programme.

1589. All companies were also required by legislation to submit a form annually to the MNREP on the type and quantity of ODS that they used or imported. Since 2004, the NOU maintained a database on the quantity of ODS installed in companies, and the quantities of ODS that each company had import/export. However, there were also no statistics provided to the evaluation team as a result of an analysis of the information submitted by companies. There were no inspections of the companies by environmental Inspectors to verify the reports received and to follow up on cases of non-compliance. The requirement for companies to have a permit when working with ODS was suspended recently, because the government did not want do discourage work during the current economic crisis.

1590. Legislation in Kazakhstan required all companies operating with ODS to pay an "*ecological insurance*" or tax, which deterred both the import and the use of these refrigerants by SMEs. The larger servicing companies with a network of servicing operations reported that the insurance/tax was affordable, whereas the smaller companies complained that its cost was too high. Given the reduction in the quantity of ODS that was recoverable, many of the smaller servicing companies saw the insurance/tax as a disincentive for recovery and recycling operations. Therefore, application of the insurance/tax to many of the small serving operations was assessed as reducing the prospects of sustainability of the recovery and recycling programme.

1591. The '*ecological insurance*' on virgin HCFCs dissuaded smaller companies from using them altogether, and encouraged them to use other refrigerants without having to pay the cost of the insurance. There appeared to be some confusion on the cost of the insurance and how it was applied to companies, and whether or not it applied to recovered HCFCs. It seemed timely for the government to clarify such issues, particularly as one company estimated that half of the refrigeration and air-conditioning equipment in Kazakhstan currently relied on HCFCs.

8.6.5.3.4 Environmental

1592. CFC-dependent equipment was not as prevalent on the market as it was in the past, which meant that recovered CFCs had to be stored rather than recycled into equipment. Many companies reported that they were running out of space to store contaminated ODS and, moreover, they were frustrated by the lack of solution to the problem. One of the enterprises preferred contaminated ODS to be accumulated at a central facility, rather than the present decentralised system which was less secure.

1593. Some companies reported to the assessment team that there was no legislation that banned emissions of ODS and instigated fines, which meant that companies that chose the cheap option of releasing CFCs were financially better off than those that put time and effort into their recovery and storage. The lack of legislation that fined companies for emissions of ODS was assessed as reducing the prospects of sustainability of the recovery and recycling programme.

1594. Some companies and the NOU were concerned that the effort to recover and reclaim ODS was being undermined by the lack of destruction. There was no provision for destruction in the original project design. There is now a risk that the unwanted recovered ODS will be emitted by private companies due to storage constraints and /or leakage from containers overtime.

8.6.5.4 Catalytic role

1595. There were 50 manual pumps, 595 recovery machines and 59 recovery and recycling machines (total 704 pieces of equipment) that were allocated to an estimated 371 domestic and commercial refrigeration workshops or service centres. As some of the larger service centres and workshops received more than one machine, this meant that 15-30% of them did not receive equipment which indicated some catalytic potential. Companies without such machines either made arrangements to share them with a beneficiary company, purchased their own equipment, or did not undertake any ODS recovery and recycling activities. Unlike in the other CEIT countries, there were no reports of companies purchasing their own recovery and recycling equipment in Kazakhstan, even though there was a financial saving as a result of not having to purchase CFCs.

1596. One of the responsibilities of the NOU was to re-allocate machines to another company if the

machines were not being used or where being used inefficiently. There was no evidence that Kazakhstan re-allocated the machines and, as discussed above, even though the information on ODS was reported to the NOU by most of the companies there was no collation and analysis of the results provided to the assessment team. Therefore it was not possible to assess some catalytic impact through the re-allocation of the equipment.

8.6.5.5 Achievement of outputs and activities

8.6.5.5.1 Delivered outputs

1597. The achievement or performance indicators for this project (from Section 8.6.5.2.1 on page 331) were:

- The quantity of equipment supplied for recovery and recycling of ozone-depleting substances;
- The number of servicing enterprises and servicing centres that received the equipment;
- Training of technicians in best-practice recovery and recycling of ozone-depleting substances;
- The amount of recovered, recycled and destroyed ozone-depleting substances as a result of the sub-project.

1598. The delivered outputs are discussed for each of the performance indicators.

8.6.5.5.1.1 Equipment supplied for the recovery and recycling of ozone-depleting substances

1599. The refrigerant recovery and recycling equipment sub-project provided 695 recovery machines, 50 manual pumps/bags and 59 recovery and recycling machines. A refrigeration expert in Kazakhstan chose the type of equipment, and some of the major companies helped to distribute it to the workshops and servicing companies. All of equipment was used, except the 500 litre bottles which were considered too large. The most useful sizes were the 10, 20 and sometimes 40kg bottles.

1600. The equipment was delivered in Kazakhstan in mid-2002. A first set of workshops took place in Aug/Sept 2002 in Southern Kazakhstan. The recipients received training in operation and maintenance and 47 recovery sets and 12 recycling sets were distributed. Additional equipment was distributed afterwards. A second set of workshops took place in November/December 2002 in West Kazakhstan, after which 143 recovery sets and 41 recycling sets were distributed. Finally, a last set of workshops took place in August 2003, after which the Government distributed the remainder of the equipment.

1601. In return for receiving the 3R equipment, beneficiary companies were required to report on the amount of refrigerant recovered, recycled and reclaimed. However, no legislation had been put in place that mandated all companies to report annually to the Ministry of Environment (MoE) on the amounts recovered, recycled, reclaimed and destroyed. The NOU reported that only about 30% of the 700 users of equipment actually submitted reports to the NOU on ODS recovered and recycled. Reports were not received from those that did not have access to fax or email.

8.6.5.5.1.2 Number of servicing enterprises and servicing centres

1602. The equipment was sought after by ODS recovery and recycling companies because it avoided the need to purchase CFCs, which were not readily available. Further comments on the value of the recovery and recycling equipment were provided by five enterprises in Section 8.6.4.5.2 entitled *Awareness about ODS, ODS substitute technology, and strengthening of institutional capacities for dealing with ODS phase-out*: Oasis (page 322), Combitech (page 323), Polair (page 323), Torg Teknik (page 324) and Auto Klimat (page 324).

1603. Some companies reported that the lack of legislation discouraged their ongoing recovery and recycling activities, as there was no legislation that banned emissions of ODS and instigated fines. The '*ecological insurance'* on virgin HCFCs dissuaded smaller companies from using them altogether, and encouraged them to use other refrigerants without having to pay the cost of the insurance. There appeared to be some confusion on the cost of the insurance and how it was

applied to companies, and whether or not it applied to recovered HCFCs. It seemed timely for the government to clarify such issues, particularly as one company estimated that half of the refrigeration and air-conditioning equipment in Kazakhstan currently relied on HCFCs.

1604. In regard to timeliness, some of the companies reported that the peak of the CFCs had been missed as the project started later than anticipated. Most companies, however, reported that the recovery and recycling programme was valued as it recovered and recycled ozone-depleting substances and avoided the need to purchase new ozone-depleting substances.

8.6.5.5.1.3 Training of technicians

1605. The first set of workshops took place in August/September 2002 in Southern Kazakhstan: the recipients received training in operation and maintenance and 47 recovery sets and 12 recycling sets were distributed. Additional equipment was distributed afterwards. A second set of workshops took place in November/December 2002 in West Kazakhstan, after which 143 recovery sets and 41 recycling sets were distributed. Finally, the last set of workshops took place in August 2003, after which the Government distributed the remainder of the equipment.

8.6.5.5.1.4 Amount of ODS recovered, recycled and destroyed

1606. According to the Project Document, the recovery equipment was intended to recover a total of about 360 ODP-tonnes of ozone-depleting substances over a three year period the sectors that included the domestic, commercial and industrial refrigeration; mobile air-conditioning, refrigerated truck transport and railway wagons (Table 44). The amount that was intended for recovery was equivalent to about 42% of the use of ozone-depleting substances in the whole GEF Project.

Table 44: Estimated recovery of ODS from various sectors over a 3 year period in Kazakhstan

Sub-sector	Subsector use in ODP Tonnes	Estimated Total Number of Refrigeration Workshops or Centres	Number of Recovery Machines	Amount of ODS saved in ODP Tonnes	Percent age of saved
1	2	3	4	5	6
Domestic Refrigeration	140.9	235	120	29.16	20.7
Domestic Refrigeration (Bags)		105	50	0.00	
Commercial Refrigeration	260.73	340	200	48.60	18.6
Total of Domestic and Commercial Refrigeration	401.63	371	320	77.76	19.4
Industrial Refrigeration	134.01	45	75	109.35	81.6
Refrigerated trucks	112	60	180	43.74	39.1
Car mobile air conditioning	36.21	20	40	9.72	26.8
Refrigerated railway wagons	171.39	434	80	116.64	68.1
Chillers (excluded from programme)	2.68	1,270	0		0.0
Total	857.92		695	357.21	41.6

Project Proposal, December 1999

1607. It was not possible to assess the success of the recovery and recycling programme because information was not available on the quantities that had been recovered and recycled in Kazakhstan. Legislation was not in place that required mandatory reporting. Although reporting by companies was a condition of receiving the equipment, the NOU reported that it had not seen the results from the 3R reports that were sent to the Environmental Research Institute for collation and analysis of the ODS recovered, recycled and reclaimed by the RSEs.

1608. Service workshops and companies were encouraged, on the basis of financial savings through not having to purchase CFC-12, to maintain their own systems and/or equipment. The infrastructure within Kazakhstan was in place for collecting, recycling and distributing CFCs. However, it was impossible to assess the results of the recovery and recycling programme because information was not available on the quantities that were recovered and recycled.

8.6.5.5.1.5 Equipment used by customs officers to detect illegal imports of ozone-depleting substances

1609. The Refrigerant Identification Machines (RIMs) were deployed mostly on the border with China. They were reported to be simple to use but not particularly practical, as the batteries ran down quickly and their portability was reduced when they were plugged into mains power. Some MAC equipment examined at the border gave false positives, and they relied mainly on MAC size to determine whether it was legal to be imported or not. They did not have connector equipment to take an ODS sample from the circuit of a refrigerator or compressor. If a sample of ODS were to be taken, the only laboratory that could determine the type of ODS was not accredited for this purpose, as a special column was needed for the gas chromatograph equipment which had yet to be purchased. Very seldom were trucks turned back as a result of customs checks, which was estimated to be once per year.

1610. The Customs reported that there was no legislation in place that could prevent the entry of illegal ODS, even if the officers were to intercept it. The Customs Agency anticipated that MNREP would develop the legislation in cooperation with the Customs Agency, which would then empower officers to intercept illegal trade and prosecute smugglers successfully. However, legislation had been adopted in 1999, 2003 and 2004 (see Table 43) that established a list of ODS and ODS-containing products and their transport.

1611. It was not clear why Customs reported that there was no legislation in place to combat illegal trade in ODS, particularly as Kazakhstan had intercepted illegal trade in ODS in the past and had taken potential violators to court. In 2007, Customs officers seized 7 cylinders of HCFC-22, 2 cylinders of HFC-134a and 1 cylinder of R409A that were hidden on a train travelling from Russia to Kazakhstan[262]. As the HCFC-22 imports were not licensed they were classed as illegal, and a criminal case was launched against the train company within 5 days of the interception. Kazakhstan did not report on the outcome of the case.

1612. The impact of the Kazakhstan's work on border security has been partially successful. The Customs were not aware of the legislation that had been implemented in Kazakhstan to control illegal trade in ODS, possibly because the training was undertaken 5 years ago and that the officers in place now were not those that received the training. The NOU did not report that further training of Customs officers had taken place more recently. Given that the legislation is in place and that it does empower Customs to take action on illegal trade, and that Customs have received ODS detection equipment and training, it remains for Customs to be more proactive in monitoring ODS and the border and in taking action when illegal trade is detected.

1613. In order to address the illegal trade, on 15 December 2007 Kazakhstan launched a programme in cooperation with China at the «Kalzhat - Dulat» and «Maykapchagay - Zimunay» border crossings. Kazakhstan customs required the exporter to provide a description of the imported goods in Russian or English to facilitate an understanding of nature of the goods being imported.

8.6.5.5.2 Awareness of ODS, ODS substitute technology, and strengthening of institutional capacities for dealing with the ODS phase-out

1614. The NOU carried out Awareness Raising workshops in 2005 and 2006 that targeted at the general public and industry, which were reported by the newspapers, radio and TV. Contests were held on the Ozone Day, there were posters by children, and essays on ozone and climate change issues. A brochure was published called "*Ozone Story*". T-shirts, caps, and pens with UNEP and OLP logos were distributed.

1615. As in many other countries, Kazakhstan undertook activities on Awareness Raising to shore up support from the public, government and business stakeholders for legislation and activities that would restrict and eventually phase out ODS. A baseline and performance indicators to measure

[262] Rodichkin, S. 2008. Illegal Transport of ODS in the region of the Regional Intelligence Liaison Offices (RILO) WCO for CIS countries in 2007. UNEP regional ozone network for Europe and Central Asia. Paper No 52.

the benefits of ODS reduction as a result of the awareness programme were never developed. These could have been, for example, before and after data on the number of ODS-free refrigerators bought by the general public, an increase in ODS refrigerators being sent for recycling, demand for information on the website (as number of hits) on ODS-free alternatives. It was therefore impossible to evaluate the impact of the awareness programme.

1616. The NOU met with key users of ODS to promote the use of substitutes for ODS and was well-known to them, which was evident to the assessment team when we met on-site with a wide range of company representatives. An effective and efficient documentation centre and information Focal Point was developed to disseminate information on ozone matters both on request and via public awareness programmes. The NOU developed a website to release information to the public and to industry in an efficient manner.

1617. The funding by the GEF of Institutional Strengthening has not resulted in an institutional structure that is fully responsive to the requirements for continued recovery and recycling of ODS. The lack of legislation on recovery and recycling e.g. ban on emissions, fine for emissions, has not discouraged the venting of ODS and has not encouraged ongoing widespread use of the ODS recovery and recycling equipment.

8.6.5.5.3 Authority / credibility, necessary to influence policy and decision-makers

1618. The NOU has a great deal of ability to influence decision-makers in companies, which was evidenced by the distribution of the equipment to the ODS recovery and recycling workshops and servicing companies. However, the NOU has little ability to influence decision-makers in regard to the timely adoption of legislation, as legislation is constantly delayed. In regard to the recovery and recycling programme, this has resulted in a decline in interest by companies, as evidenced by the reduction in the number of personnel attending the training programmes (described above).

8.6.5.6 Assessment of monitoring and evaluation systems

8.6.5.6.1 Monitoring and evaluation design

1619. In its capacity as coordinator of all activities related to the Montreal Protocol in the country, the NOU was made available to the Ministry through the Institutional Strengthening project to allow the NOU to supervise the recovery and recycling activities. Furthermore, the NOU was required to keep records of the distribution of the equipment and the amounts of ODS recovered and recycled by each workshop and service centre.

1620. The consultant was required to establish a database to monitor the amount of ODS recovered and recycled, according to information received from the ODS service centres and workshops. The consultant was required to analyse the data received and to produce monthly reports. Because of the large size of Kazakhstan, it was envisaged that one or two additional part time consultants would be located in different regions to assist in these data receival, assessment and reporting tasks.

1621. The consultant was required to ensure that the operations for most effective use of the above equipment were established. In particular, monitoring would make sure that:

- The recovery machines were distributed according to criteria of maximum recovery of CFC;
- All the equipment was properly used, kept and maintained;
- Proper records of the amounts of CFC recovered, recycled and reused were maintained; and
- Recovery and Recycling equipment would be redistributed in case some workshops did not use them at all, or used them inefficiently.

8.6.5.6.2 Monitoring and evaluation plan implementation

1622. There was no evidence that the NOU fully implemented this plan. The NOU informed the assessment team that it had not seen the results from the ODS recovery and recycling reports that were sent to the Environmental Research Institute for collation and analysis of the ODS recovered, recycled and reclaimed by the servicing companies. This suggested that the

Environmental Research Institute was the consultant for collating, assessing and reporting the ODS data received from ODS recovery and recycling companies, and that the Institute as not implemented and executed the tasks as originally envisaged.

1623. In January 2001 a national consultant was reported to have been hired to update the list of CFC users in the refrigeration servicing sector and to assist in the preparation of the training workshops. There was no evidence that their responsibilities extended also to collating, assessing and reporting the ODS data received from ODS recovery and recycling companies.

8.6.5.6.3 Budgeting and Funding for monitoring and evaluation activities

1624. At least one national consultant was allocated to the budget to assist the NOU with these tasks. The amount budgeted for monitoring, analysis and reporting was $20,000. There was also a further $10,000 allocated for the Project Completion Mission by an international consultant. The assessment team did not have access to financial documents since the focus of the assessment was on the outcomes and impact of the sub-project.

8.6.5.6.4 Long-term monitoring

1625. The long-term monitoring of this ODS recovery and recycling depends on legislation that mandates ODS recovery and recycling, as well as resources (equipment and personnel) to collate, analyse and report on a regular basis. The legislation was absent, and there was no evidence of resources allocated for long-term monitoring. The 2003 Project Implementation Report reported that only one year of monitoring was planned.

1626. The lack of legislation and low-level resources for ODS monitoring was assessed by the team as a missed opportunity, particularly with the need in the near future to recover and recycle HCFCs in order to reduce consumption as a result of the 2007 agreement by the Parties to accelerate their phase out in the Montreal Protocol.

8.6.5.7 Assessment of processes that affected attainment of project results

8.6.5.7.1 Preparation and readiness

1627. As evidenced by the report of the distribution of equipment and training, there was a roll out of both which suggested that Kazakhstan had a reasonable level of preparation and readiness for the sub-project. The equipment was delivered to Kazakhstan in mid-2002. The first set of workshops took place in August/September 2002 in Southern Kazakhstan: the recipients received training in operation and maintenance and 47 recovery sets and 12 recycling sets were distributed. Additional equipment was distributed afterwards. A second set of workshops took place in November/December 2002 in West Kazakhstan, after which 143 recovery sets and 41 recycling sets were distributed. Finally, the last set of workshops took place in August 2003, after which the Government distributed the remainder of the equipment.

1628. This roll out described above indicated that the servicing company identification and equipment distribution components were practicable and feasible within the timeframe of the sub-project. However, the lack of data on the quantity of ODS recovered and recycled precludes an assessment of how well the equipment was distributed and how efficiently the equipment was used.

8.6.5.7.2 Country commitment and motivation

1629. The roll out of equipment which was coupled with the training indicated that Kazakhstan was committed to the ODS recovery and recycling project, at least during the term of the Project. This indicated an acceptable level of government commitment and motivation. However, once the project was completed, Kazakhstan did not adopt legislation that required a company to contain ODS and to recover and recycle ODS, which eliminated the prospects for this programme to be sustainable.

1630. The lack of destruction for recovered but unusable ODS was de-motivating to companies, as they had to find space for large bottles of ODS in facilities that were often quite cramped. There was also no information provided to companies on the amount of ODS recovered and recycled at the country level, which did not motivate companies to continue such operations.

8.6.5.7.3 Stakeholder involvement

1631. The sub-project involved stakeholders such as the companies and workshops that were involved in servicing ODS contained in sectors that included domestic, commercial and industrial refrigeration; mobile air-conditioning; refrigerated truck transport and railway wagons. This was a diverse range of stakeholders, and the NOU did well to distribute the equipment to such a widely different sectors.

1632. Other stakeholders included the government, and specifically key representatives in the Ministry of Natural Resources and Environmental Protection. The NOU was assessed as having less impact on these stakeholders as legislation important to recovery and recycling of ODS was not adopted.

1633. The involvement of stakeholders was coupled with separate but important activities undertaken by the NOU that raised company and public awareness of ODS, and training programmes for technicians and Customs officers on best practices for handling ODS and detecting it respectively.

8.6.5.7.4 Financial planning

1634. The Final Project Implementation Report showed that $12,000 was planned as expenditure in the remainder of the budget of $2,545,219. This small remaining balance relative to the overall size of the budget indicated that Kazakhstan maintained the programme within budget and it was therefore assessed as financially well-planned.

8.6.5.7.5 UNEP / UNDP supervision and support

1635. UNOPS undertook a mission in September 2001 shortly after the beginning of the programme to assist with the preparation of equipment specifications, which were prepared and presented to the government counterpart. UNOPS subsequently placed a purchase order for the equipment in December 2001.

1636. There were no other documents available to assess the level of supervision and support by UNDP.

8.6.5.7.6 Co-financing and project outcomes & sustainability

1637. There was no co-financing involved in this project.

8.6.5.7.7 Project implementation delays and impact on project outcomes & sustainability

1638. The project was commenced in August 2001 and was completed in 2006 when the last training took place. The programme therefore about 2 years longer than the 3-years originally intended.

1639. The delay in completion increased the duration of the project and enhanced its sustainability in the short term. However, the lack of sustainability in the longer term is more related to the lack of legislation that bans ODS emissions and imposes fines on companies when these occur, rather than to the lack of funding *per se*.

8.6.5.8 Sub-Project Rating

KAZ/00/G31 - National programme for recovery and recycling of ODS refrigerants (UNDP/UNOPS)		
Criterion	**Evaluator's Summary Comments**	**Evaluator's Rating**
Attainment of project objectives and results Sub criteria (in yellow below)	See comments below	S
Effectiveness	No information provided on the amount of ODS recovered and recycled, so impossible to assess	MS

KAZ/00/G31 - National programme for recovery and recycling of ODS refrigerants (UNDP/UNOPS)		
Criterion	**Evaluator's Summary Comments**	**Evaluator's Rating**
Relevance	Recovery and recycling of ODS is consistent with avoiding new production of ODS and thereby minimising the detrimental effect of ODS on the ozone layer	HS
Efficiency	No information provided on the amount of ODS recovered and recycled, so impossible to assess	MS
Sustainability of Project outcomes (overall rating) Sub criteria (in yellow below)	See comments below	S
Financial	Spare parts for equipment costly and sometimes not available, which reduced the sustainability. Companies were convinced of financial savings of recovery and recycling ODS	S
Socio-Political	Programme initiated too late, but the NOU did the best at the time to implement the programme	S
Institutional framework and governance	Legislation was not in place to ensure continuity of the programme; government ecological insurance or tax de-motivated smaller companies to continue the programme; no feedback from the NOU on the value of the programme to users	MS
Environmental	Storage of unusable CFCs and other ODS was a disincentive to recovering them, and those stored were likely to leak because storage space is difficult causing environmental damage. Legislation did not support ongoing activities in this programme, leading to environmental damage.	MS
Achievement of outputs and activities	The equipment was widely distributed to technicians in different sectors including Customs officials	S
Monitoring and Evaluation (overall rating) Sub criteria (in yellow below)	See below	
M&E Design	There was a good M&E design	HS
M&E Plan Implementation (use for adaptive management)	There was no evidence that the M&E Plan was fully implemented, but it may have been partially implemented	MS
Budgeting and Funding for M&E	$30,000 budgeted for consultants, but	MS

KAZ/00/G31 - National programme for recovery and recycling of ODS refrigerants (UNDP/UNOPS)		
Criterion	**Evaluator's Summary Comments**	**Evaluator's Rating**
activities	unable to fully assess how this was used	
Catalytic Role	No categorisation required	
Preparation and readiness	Limited preparation and readiness for this project, which has reduced the prospects for sustainability	S
Country commitment and motivation*	Kazakhstan was committed prior to and during the project, but commitment after the project is not evident	S
Stakeholders' involvement	The project involved the relevant stakeholders and made use of the skills, experience and knowledge of key national and international organisations	S
Financial planning	Within budget	HS
UNEP supervision and support**	Limited ability to assess the level of supervision and support as documentation was not available and there were no comments by the NOU on this aspect	S
Overall Rating		S

Highly Satisfactory (HS); Satisfactory (S); Moderately Satisfactory (MS); Moderately Unsatisfactory (MU); Unsatisfactory (U); Highly Unsatisfactory (HU);
*Motivation replaced TOR '*driveness*'; **Support replaced TOR 'backshopping'

8.6.6 KAZ/00/G33 Elimination of the use of CFCs at 14 manufacturers of rigid polyurethane foam enterprises (UNDP/UNOPS)

8.6.6.1 Introduction

1640. Most rigid polyurethane (PU) foam is used for insulating pipes, with a lesser amount used for insulating cold storage display cabinets. This sub-project initially aimed to replace about 104.7 ODP-tonnes per year of CFCs with non-ODS procedures for the production of rigid foam in an umbrella project that included a central supplier (called a 'Systems House' hereafter) that supplied materials to 14 rigid spray foam manufacturers (called 'manufacturers' hereafter). This was later increased to 17 manufacturers and 109 ODP-tonnes to be phased out. This umbrella project that consisted of the systems house and the manufacturers was considered the most effective way to achieve the transition to ODS-free technology.

1641. The project commenced in November 2001 and ended in January 2004. The project cost was $1,254,374 apportioned as $247,500 to the systems house and $821,365 to the rigid spray foam manufacturers. The assessment team and the NOU met on site with the manager of the systems house, and visited one of his manufacturers that produced rigid spray foam.

8.6.6.2 Attainment of objectives and planned results

8.6.6.2.1 Effectiveness

1642. A recipient workshop was conducted on 6 November 2001 with the participation of the NOU, the system house and the equipment suppliers (SAIP and Gusmer). All recipients endorsed the proposed supplier selection and agreed with the scope of supply for their individual needs.

1643. The Gusmer high-pressure dispensers (HPDs) arrived and were successfully installed in the premises of the manufacturers in August/September 2002. Workshops for all recipients were

conducted at the premises of the systems house. The systems house was supplied with water-based formulations, blending equipment, storage tanks, testing equipment (a small laboratory), alterations to the facility to accommodate the equipment, and technical support for formulation development. The system house was also provided with a small capacity ("compact") high-pressure foam dispenser to manufacture insulation half-shells and small blocks.

1644. The manufacturers were supplied with high-pressure dispensers (HPDs) to allow production of foam using water-based technology, skin applicators to improve the curing time and thermal properties of the foam, funding for trials, and technical support and training. A K-value tester to measure the insulation properties of the foam was considered but later withdrawn due to lack of interest.

1645. After the sub-project was completed, four of the companies went bankrupt as they were not able to absorb the costs of re-location when the land they rented was sold. Some of the remaining companies ended their use of the water-based system and instead implemented HCFC-141b for foam blowing, as they reported this was less expensive to produce and improved the foam's insulation quality.

1646. The use of HCFCs to blow the foam was contrary to the agreement by the system house and the manufacturers to only use zero-ODP technology for foam production. It also implied that the ODS technology was not destroyed as agreed but was kept to allow reversion to ODS for foam blowing.

1647. This project's effectiveness was assessed as partially effective as ODS was still being used for the production of foam whereas the project had paid for zero ODS.

8.6.6.2.2 Relevance

1648. Small enterprises are most cost-effectively addressed as part of an umbrella project, with the systems house as the focus that can provide materials and advice to the individual manufacturers. This is the most cost effective way of eliminating ODS as the systems house speaks the same language as its manufactures whom it supplies thereby facilitating technology transfer. The use of water-based technology eliminates ODS but increases the operating costs for all participants equally, so that all of them face the same costs to get the product to the market and the ozone layer benefits through the elimination of ODS emissions.

1649. More generally, the elimination of the use of ODS in rigid foam production in Kazakhstan was also consistent with the objectives of the Vienna Convention and the Montreal Protocol, which *requires Parties to take appropriate measures in accordance with the provisions of this Convention and of those Protocols in force to which they are party to protect human health and the environment against adverse effects resulting or likely to result from human activities which modify or are likely to modify the ozone layer*[263].

1650. The GEF established in 1995 an Ozone Layer Depletion Focal Area in response to the Montreal Protocol. The Focal Area has the strategic objective of protecting human health and the environment by assisting countries to phase out their consumption and production of ODS, to prevent emissions of ODS, and to encourage the uptake of alternative technologies and practices according to a country's commitments under the Montreal Protocol. The financial interventions in the GEF Focal Area contribute to the return of the ozone layer to pre-1980 ozone levels, which is expected by 2065.

1651. Most recently, the dual capability of ODS to both reduce ozone and to have a detrimental impact on the climate have been described[264]. Global ODS consumption in 1989 was equivalent to about 9,200 million tonnes (9 Gt) CO_2-eq/year, which was reduced to about 1,870 million tonnes (1.8 Gt) CO_2-eq/year in 2007 as a result of ODS phase-out activities under the Montreal Protocol. This reduction of about 7 Gt CO_2-eq/year was at least three times greater than the Kyoto Protocol's reduction target (about 1-2 Gt CO_2-eq/year in 2008-2012), demonstrating that the global ODS reductions achieved so far have already yielded a larger climate benefit than the current Kyoto Protocol target.

---

[263] Handbook for the Vienna Convention for the Protection of the Ozone Layer - 7th Edition (2006). Article 2: General Obligations.

[264] Velders, J.M., Andersen, S.O., Daniel, J.S., Fahey, D.W. and M. McFarland. 2007. The Importance of the Montreal Protocol in protecting climate. http://www.pnas.org/content/104/12/4814.abstract

1652. The actions taken by Kazakhstan to eliminate ODS in rigid foam production was therefore relevant to further protection of the ozone layer (Montreal Protocol) and relevant to reducing the impact of radiative forcing of the climate (Kyoto Protocol).

8.6.6.2.3 Efficiency

1653. The cost-effectiveness of the programme was assessed in the Project Proposal as $9.87 / ODP-kg per year, on the basis of an incremental cost of $1,035,363 to the manufacturers and a reduction of 104.9 ODP-tonnes of CFCs per year.

1654. Assuming all of the ten remaining manufacturers out of the initial fourteen in the sub-project reverted to HCFC-141b for foam blowing, which has an ODP of 0.11 compared with CFCs that have an ODP of 1.0, the efficiency would in theory be about 11% higher as about 11% of the ODS that should have been phased out still remained. The theoretical cost-effectiveness was therefore equivalent to about $10.96 / ODP-kg. However, the assessment team was informed that some but not all of the manufacturers reverted to HCFC-141b, so the efficiency would be between $9.87 to $10.96 / ODP-kg. The MLF threshold for the sector was $7.83 / ODP-kg but the manufacturers were paid more to partially compensate for increased operational costs incurred as a result of the installation of water-based technology instead of the much cheaper operating costs involved when using HCFC-141b.

8.6.6.3 Assessment of sustainability of project outcomes

8.6.6.3.1 Financial resources

1655. The project was delivered within budget. Residual funds were earmarked for training of 4 personnel in the US on the production of rigid spray foam in cold conditions.

1656. It appears that rigid foam was manufactured using water-based technology as long as the operating expenses in the sub-project covered the additional operational costs. As soon as the funds for the additional operational costs were depleted, the manufacturers in collaboration with the systems house that would be needed to supply the HCFC-141b, reverted to HCFC-141b to blow the foam.

1657. More than 95% of the foam production was for the local market, and not for export. Therefore, the competition for the market position was equal for all manufacturers as each faced the same costs for foam based on water-based technology.

8.6.6.3.2 Socio-political

1658. The sustainability of the project depended on the commitment of the enterprises and the system house to the “letter of commitment”, which *inter alia* required the complete phase out of ODS and the disposal of disposal of any equipment that was replaced with equipment for the production of foam using water-based technology.

1659. The representative of the systems house thought that the companies would revert back to water-based technology when HCFCs are banned from import. This indicated that the reversion to ODS technology was profit motivated.

1660. The systems house and the manufacturers were assessed as not being committed to the project requirements, which ended the prospects of the sustainability of ODS-free foam production.

8.6.6.3.3 Institutional framework and governance

1661. Kazakhstan’s institutional framework and governance was assessed as weak as the NOU did not report to the assessment team on any action taken by the government to enforce the terms of the “letter of commitment” that was agreed by the system house and the manufacturers. There was also no legislation in place that banned ODS emissions and fined companies that emitted ODS.

8.6.6.3.4 Environmental

1662. This strategy to produce foam more profitably using ODS technology came at the expense of the ozone layer, even though the GEF had paid for equipment that would avoid ODS altogether. The environmental impact on the ozone layer would have been about 90% less than the CFCs that were phased out. Nevertheless, there should have been no environmental impact on the ozone

layer after the project was completed since the project funded the complete replacement of ODS. The HCFC-141b will continue to reduce the ozone layer until such time that Kazakhstan prohibits their use for foam production and enforces the prohibition.

1663. The CO_2 that was generated as a result of the use of the water-based technology would have an impact (albeit negligible) on global warming.

8.6.6.4 Catalytic role

1664. All of the manufacturers within Kazakhstan were included in the project, and therefore there was no potential for catalytic or replication effect of non-beneficiaries as a result of the project. The assessment team noted that the Project Document in December 1999 referenced 14 manufacturing companies, but the systems house and the NOU discussed 16 companies. Therefore, the project was extended by two companies which eliminated any possibility of a catalytic effect.

8.6.6.5 Achievement of outputs and activities

8.6.6.5.1 Delivered outputs

1665. About 5 years after the sub-project was completed, four of the manufacturers went bankrupt as they were not able to absorb the costs of re-location when the land they rented was sold. Some of the remaining manufacturers terminated their use of the water-based system and instead reverted to ODS (HCFC-141b) for foam blowing, as they reported foam produced with HCFC-141b was less expensive to produce than when using the water-based technology and the use of the HCFCs improved the foam's insulation quality.

1666. The use of HCFCs to blow the foam is contrary to the agreement by the system house and the manufacturers to use only zero-ODP technologies as a result of the project. This project was assessed as being partially useful in eliminating ODS, as some HCFCs were still being used for the production of foam.

1667. The timing of the project was suitable, but it did not foresee the lack of commitment by the system house and the manufacturers to adhere to their signed agreement to phase out ODS.

8.6.6.5.2 Awareness about ODS, ODS substitute technology, and strengthening of institutional capacities for dealing with ODS phase-out

1668. As a result of UNDP and NOU meetings prior to the project, the system house and the manufacturers were aware of ODS and alternative technology for foam blowing which were under consideration[265], such as the advantages and disadvantages of HCFC-141b, HCFC-22, HCFC-141b/HCFC-22 blends, hydrocarbons, water-based systems, liquid HFCs and HFC-134a.

1669. The use of ODS-free technology had been stressed in this project because additional funds were required to partially cover the operating costs of the water-based technology, compared to the use of HCFCs. The GEF required that funded projects were ODS-free and did not support interim low-ODP ODS technology, such as the use of HCFCs. The water-based technology was accepted by the systems house as well as the foam manufacturers.

1670. After the project finished, the NOU carried out Awareness Raising workshops in 2005 and 2006 that targeted at the general public and industry, which were reported by the newspapers, radio and TV. Contests were held on the Ozone Day, there were posters by children, and essays on ozone and climate change issues. A brochure was published called "*Ozone Story*". T-shirts, caps, and pens with UNEP and OLP logos were distributed. It is possible that the systems house and the manufacturers became more aware of ODS and its impact on the ozone layer as a result of this NOU programme.

1671. The funding by the GEF of Institutional Strengthening did not result in an institutional structure that was able to enforce the systems house and the manufacturers to adhere to their 'letter of commitment' to eliminate ODS and ODS technology as a result of receiving funds and equipment in the Project.

[265] Project Proposal, 24 December 1999.

8.6.6.5.3 Authority / credibility, necessary to influence policy and decision-makers

1672. The project outputs demonstrated that ODS-free foam production was possible as the water-based technology was installed. The NOU did not advise the team of any action that they had taken to influence the policy and decision makers in government to enforce the terms of agreement contained in the *Letter of Commitment* that was agreed by the system house and the manufacturers prior to the start of the project, and which required only the use of non-ODS technology.

8.6.6.6 Assessment of monitoring and evaluation systems

8.6.6.6.1 Monitoring and evaluation design

1673. The systems house and the rigid foam manufacturers signed the '*Letter of Commitment'* that allowed *monitoring inspections by UNDP or designate during project implementation and thereafter to verify proper implementation and subsequent operation without the use of CFCs*.

1674. Although the wording did not specify '*ODS*' in place of '*CFCs'* above that would have then precluded the use of HCFCs, it did specify *proper implementation* which implied the installation of water-based technology and the disposal of any equipment that water-based technology replaced.

1675. Implementation of the project also included *disposal of any equipment that has been replaced under this project in compliance with the stipulations that have been drawn up in the Project document.* There were 26 low-pressure dispensers that were functioning that were required to be destroyed.

1676. After installation of the equipment, the equipment provider returned to conduct trials. During a phase-in period, the manufacturers were permitted to deplete CFC inventories. A UNOPS representative visited to generate the Certificates of Completion. During these visits, individual statements of completion will be signed, replaced equipment would be destroyed and information for the project completion report (PCR) would be collected[266].

8.6.6.6.2 Monitoring and evaluation plan implementation

1677. Closing procedures were drawn-up for implementation in November 2002, after allowing the systems house and the manufactures a 3-month phase-in period. However, the companies still used at that time HCFC-141b for foam production, and the water-based systems were not yet operational even though 2 months had passed since installation. The Statement of Completion from each stakeholder was deferred to May 2003, then to November 2003 and finally to January 2004 when the systems house completed these visits.

1678. UNDP or NOU representatives were not available to inspect the premises and to collect the completed Statement of Completion from the system house and each manufacturer. The Final Report shows that that the low-pressure equipment was not destroyed as it stated there was a '*disposal plan'* (present tense), whereas the same table showed '*replaced equipment'* (past tense). As there was no confirmation that the low-pressure equipment was destroyed, the opportunity for the systems house and the manufacturers to revert to HCFC-141b foam blowing remained a possibility. Reversion to HCFC technology was contrary to the GEF intention and the Letters of Commitment signed by the systems house and the manufacturers.

1679. The collection of the Statements of Completion by the systems house representative meant that there was neither an independent report confirming the destruction of the functioning low-pressure dispensers on the sites of the manufacturers, nor information on the proper implementation and operation of the water-based technology. The Statements of Completion were not attached in Annex 6 of the Final Implementation Report.

8.6.6.6.3 Budgeting and Funding for monitoring and evaluation activities

1680. There was no information provided in the Project Proposal, provided by UNDP or provided by the NOU that reported on the budget and funding for the monitoring and evaluation activities described above.

[266] Final Implementation Report, 5 March 2004 Bert Veenendaal

8.6.6.6.4 Long-term monitoring

1681. There was no intention to carry out long-term monitoring of this project beyond the term of the project.

8.6.6.7 Assessment of processes that affected attainment of project results

8.6.6.7.1 Preparation and readiness

1682. The assessment team found no evidence to show that UNDP/UNOPS had tried to predict in advance which foam-producing companies were likely to revert to ODS technology, perhaps on the basis of production procedures, product insulation criteria, financial viability or other factors.

1683. About 20% of the companies went bankrupt when they could not sustain the costs of moving to new premises, which suggested that the financial viability of some of the companies was marginal at the start of the sub-project and therefore they should not have received funding.

1684. On this basis, Kazakhstan was assessed as poorly prepared for this sub-project.

8.6.6.7.2 Country commitment and motivation

1685. To show full commitment, Kazakhstan would have banned the use of HCFCs for foam production and followed up with each enterprise to make sure that HCFCs were not being used for foam production. The ban on the use of HCFCs should have been drafted before the start of the project in 2001 by the NOU and implemented before the end of the project in 2004, so there was sufficient time. No such legislation was implemented, which resulted in a reversion to ODS technology for foam blowing even when equipment was supplied and installed for the production of rigid foam using non-ODS technology. Kazakhstan failed to predict that reversion to ODS technology was possible unless legislation was in place to guard against the use of ODS technology for foam production.

1686. Kazakhstan was assessed as partly committed to this project as CFCs were replaced with lower ODP HCFCs for foam production, which reduced the potential for damage to the ozone layer. Kazakhstan did not indicate any action that was taken as a result of the reversion to ODS technology.

8.6.6.7.3 Stakeholder involvement

1687. The most important stakeholders were the system house; the manufacturers (17) of rigid foam; the local consultant (Mr Denis Kuznetsov) and the international consultant (Mr Bert Veneendaal) for technical advice; the manufacturers of the equipment for installation, technical advice, and training; and the NOU.

1688. The project involved the relevant stakeholders for information sharing, consultation and participation and in doing so, it made use of the skills, experience and knowledge of key national and international organisations, regional departments and enterprises in Kazakhstan. These included UNDP locally and international consultants, and the customs committee (for equipment clearance).

8.6.6.7.4 Financial planning

1689. There were $12,458 remaining out of the grant approved of $1,068,866 which was earmarked to fund a study tour to the United States for 3 personnel in the foam industry from Kazakhstan and a UNDP representative to undertake training in the production of rigid spray foam in cold conditions. The financial planning was therefore assessed as satisfactory.

8.6.6.7.5 UNEP / UNDP supervision and support

1690. Supervision and support to the manufacturers was left to the systems house, as it was recognised early on in the project that it was the systems house that had the relationship with the manufacturers. Systems house support was acknowledged to be less expensive as it avoided the need for an international consultant, language difficulties or cultural challenges were minimised, and the systems house was provided with technical assistance for its operation as well as the foam manufacturing operations.

1691. There was no evidence in this project of a UNDP visit to Kazakhstan to view the installed equipment and its operation. The only record of a visit is 16-19 July 2007, some 3 years after the

completion of the project when the UNDP/UNOPS consultant filed a Back to the Office Report for this and other projects undertaken in Kazakhstan[267].

8.6.6.7.6 Co-financing and project outcomes & sustainability

1692. The Project document stated that $416,079 had been identified as 2-years of incremental operating costs for the 17 manufacturers, as a result of the installation of the water-based foam-producing technology. These costs did not comply with the GEF guideline and were therefore not eligible for inclusion in the GEF Grant.

1693. However, in recognition of the additional operating costs incurred by the water-based technology compared to the HCFC technology, and in recognition that this was a conversion to non-ODS technology, the project was granted higher capital costs of $222,660 as an umbrella phase out project. This compensation meant that the higher operating costs of $416,079 were reduced to $193,419 of co-financing as in-kind payments shared between the 17 manufacturers.

1694. The financial compensation funded by the Grant for operating costs did not commit the manufacturers to ODS-free foam production. Effectively they *'took the money and ran'*. The funds were intended as compensation for foam production using water-based technology, but instead they used these funds for operating expenses and then reverted to cheaper foam-producing HCFC technology when the operating expenses were depleted.

1695. The funding agreement to compensate the manufacturers for higher production costs did not promote sustainability because the manufacturers did not comply with the Letter of Commitment to not use ODS technology.

8.6.6.7.7 Project implementation delays and impact on project outcomes & sustainability

1696. The project was scheduled to be completed over 3 years, which was about the duration of the project. Other factors described above influenced sustainability, and not the duration of the project.

8.6.6.8 Sub-Project Rating

KAZ/00/G33 – Elimination of the use of CFCs at 14 manufacturers of rigid polyurethane foam enterprises (UNDP/UNOPS)		
Criterion	**Evaluator's Summary Comments**	**Evaluator's Rating**
Attainment of project objectives and results Sub criteria (in yellow below)	See comments below	MS
Effectiveness	Water-based foam-producing technology was installed but the manufacturers reverted to foam production using ODS	MS
Relevance	Conversion to non-ODS technology is consistent with minimising the detrimental effect of ODS on the ozone layer	HS
Efficiency	The installation, technical advice and training were provided by the systems house and the equipment providers	S
Sustainability of Project outcomes (overall rating) Sub criteria (in yellow below)	See comments below	US

[267] Back to office report, 26 July 2007. Bert Veneendaal.

KAZ/00/G33 – Elimination of the use of CFCs at 14 manufacturers of rigid polyurethane foam enterprises (UNDP/UNOPS)		
Criterion	**Evaluator's Summary Comments**	**Evaluator's Rating**
Financial	Delivered within budget, with minor funds remaining for technical training in the US. Manufacturers remained uncommitted to ODS-free foam production despite 2 years of partial financial compensation for the additional operating costs	MS
Socio-Political	Not sustainable as the companies reverted to ODS foam production, mainly because Kazakhstan did not show commitment to non-ODS foam production	US
Institutional framework and governance	Weak institutional framework and governance as there was no legislation in place that banned ODS for this purpose	US
Environmental	90% reduction in ODP as a result of the use of HCFCs instead of CFCs for foam production, but the project paid for 100% reduction	MS
Achievement of outputs and activities		US
Monitoring and Evaluation (overall rating) Sub criteria (in yellow below)	See below	
M&E Design	Poor M&E design as there was not timely, independent follow up in the design	MS
M&E Plan Implementation (use for adaptive management)	No evidence of M&E implementation, as this was left to the systems house which was part of the project and therefore there was no independent assessment	US
Budgeting and Funding for M&E activities	None provided in the documentation examined	US
Catalytic Role	No categorisation required	
Preparation and readiness	Weak as there was no effort to predict those companies that were likely to fail, and no effort to prevent reversion to HCFC technology	US
Country commitment and motivation*	Weak as there was no legislation in place to support Kazakhstan's commitment to ODS-free foam production, and no motivation to enforce the Letter of Commitment signed by each participant in the project which required ODS-free foam production	US

KAZ/00/G33 – Elimination of the use of CFCs at 14 manufacturers of rigid polyurethane foam enterprises (UNDP/UNOPS)		
Criterion	**Evaluator's Summary Comments**	**Evaluator's Rating**
Stakeholders' involvement	The project involved the relevant stakeholders and made use of the skills, experience and knowledge of key national and international organisations	S
Financial planning	Satisfactory as the project concluded within budget with some residual funds earmarked for technical training	S
UNEP supervision and support**	UNDP/UNOPs was non-existent (US), and all the support was done by the systems house (S)	S
Overall Rating		US

Highly Satisfactory (HS); Satisfactory (S); Moderately Satisfactory (MS); Moderately Unsatisfactory (MU); Unsatisfactory (U); Highly Unsatisfactory (HU);
*Motivation replaced TOR '*driveness*'; **Support replaced TOR 'backshopping'

8.6.7 KAZ/00/G34 Elimination of the use of CFCs at 25 manufacturers of flexible foam enterprises (UNDP/UNOPS)

8.6.7.1 Introduction

1697. Flexible polyurethane (PU) foam is used for as cushioning in mattress and furniture applications. In the past, most foams were manufactured in community-owned furniture and bedding factories. The project in Kazakhstan consisted of one continuous foam manufacturer ("slabstock") and 24 box-foam manufacturers.

1698. This sub-project aimed to replace 45-50 ODP-tonnes of CFCs per year with methylene chloride and water as the blowing agent. Some manufacturers had already transition to methylene chloride and the funds were required to transition the remainder. Regional workshops were held to explain the ODS-free technology and the assistance available to transition from CFCs to this technology.

1699. The use of methylene chloride for the production of flexible foam was introduced together with safe manufacturing conditions to minimise worker exposure to methylene chloride, which is "*possibly carcinogenic to humans*" according to the International Agency for Research on Cancer. There were also training workshops that specialised in methods to produce foam of acceptable quality.

1700. Several additives have been developed to modify the chemistry of the flexible PUF production process. A special variant of additive technology is the "Low Index/Additive (LIA) Technology", in which the use of certain additives is combined with a lower TDI index, which allows up to 70% of the methylene chloride to be replaced by water as the blowing agent. LIA in combination with methylene chloride results in a higher[268] production cost, as the use of CFCs for foam blowing because of the cost of additives. The availability of proprietary additives might also be problematic in some regions and countries.

1701. The project probably commenced in late 2002 and ended in August 2004. The budget for the 3-year project was $264,000, including residual funds for technical training in the USA.

8.6.7.2 Attainment of objectives and planned results

8.6.7.2.1 Effectiveness

1702. Trademarket, a local chemical supplier and foam manufacturer identified itself and five others as

[268] 2002 TEAP FTOC Report

the only boxfoam manufacturers remaining in Kazakhstan. The remaining 18 manufacturers had gone bankrupt due to Chinese imports and the loss of the Soviet Union as a market.

1703. A technical centre was established on the Trademarket site to services beneficiary and non-beneficiary manufacturers with formulation development and property testing. A semi-automatic boxfoam manufacturing unit was also installed that was used for training in the use of CFC-free formulations and safe operating procedures.

1704. After formulation and safety training of the manufacturers on this unit, semi-automatic production equipment allowing for safe production conditions was installed in October 2003 in the facilities of the other five beneficiary manufacturers. The supplier (GF Technology) commissioned the equipment in October 2003 and relocated the Trademarket equipment to a new site and renovated it after it was damaged by frost. A commissioning certificate was issued and signed by all participants.

1705. Trademarket reported to the assessment team that the change to LIA increased the price of the flexible foam, which resulted in most of the remaining 6 companies going bankrupt about 2 years after the sub-project was completed. The manufacturers were unable to compete with cheap flexible foam imports from Russia. The Russian imports today accounted for 90% of the flexible foam market in Kazakhstan. The Russian flexible foam was produced using methylene chloride without LIA.

8.6.7.2.2 Relevance

1706. The complete elimination of ODS in the production of flexible foam in Kazakhstan is relevant for avoiding damage to the ozone layer.

1707. More generally, the elimination of the use of ODS in flexible foam production in Kazakhstan was also consistent with the objectives of the Vienna Convention and the Montreal Protocol, which *requires Parties to take appropriate measures in accordance with the provisions of this Convention and of those Protocols in force to which they are party to protect human health and the environment against adverse effects resulting or likely to result from human activities which modify or are likely to modify the ozone layer*[269].

1708. The GEF established in 1995 an Ozone Layer Depletion Focal Area in response to the Montreal Protocol. The Focal Area has the strategic objective of protecting human health and the environment by assisting countries to phase out their consumption and production of ODS, to prevent emissions of ODS, and to encourage the uptake of alternative technologies and practices according to a country's commitments under the Montreal Protocol. The financial interventions in the GEF Focal Area contribute to the return of the ozone layer to pre-1980 ozone levels, which is expected by 2065.

1709. Most recently, the dual capability of ODS to both reduce ozone and to have a detrimental impact on the climate have been described[270]. Global ODS consumption in 1989 was equivalent to about 9,200 million tonnes (9 Gt) CO_2-eq/year, which was reduced to about 1,870 million tonnes (1.8 Gt) CO_2-eq/year in 2007 as a result of ODS phase-out activities under the Montreal Protocol. This reduction of about 7 Gt CO_2-eq/year was at least three times greater than the Kyoto Protocol's reduction target (about 1-2 Gt CO_2-eq/year in 2008-2012), demonstrating that the global ODS reductions achieved so far have already yielded a larger climate benefit than the current Kyoto Protocol target.

1710. The actions taken by Kazakhstan to eliminate ODS in flexible foam production was therefore relevant to further protection of the ozone layer (Montreal Protocol) and relevant to reducing the impact of radiative forcing of the climate (Kyoto Protocol).

8.6.7.2.3 Efficiency

1711. Despite the reduction in the number of boxfoam manufacturers to only 6, there was no change to the CFC consumption baseline of 45t which had been estimated for 24 boxfoam manufacturers. Although a significant proportion of the 45t must have been eliminated because

---

[269] Handbook for the Vienna Convention for the Protection of the Ozone Layer - 7th Edition (2006). Article 2: General Obligations.

[270] Velders, J.M., Andersen, S.O., Daniel, J.S., Fahey, D.W. and M. McFarland. 2007. The Importance of the Montreal Protocol in protecting climate. http://www.pnas.org/content/104/12/4814.abstract

1712. There were no incremental operating costs as the water/methylene chloride technology for producing flexible foam was similar in operating costs to foam produced with CFCs. Even if there were an incremental operating cost, it would be paid for by the company and not the GEF.

1713. The capital cost of equipment was $200,049. The (unadjusted) amount phased out was 45 ODP-t of CFCs. The cost-effectiveness was therefore $4.45 / ODP-kg which was below the threshold of $6.23. The MLF (2001) reported that the cost-effectiveness of 71 flexible slabstock foam projects that were completed in developing countries averaged $6.23 ODP-kg per year[271]. However, if the CFC tonnage to be phased out in Kazakhstan was based on 6 rather than 24 manufacturers and the tonnage reduced on a *pro rata* basis to 11.25 ODP-t, the cost-effectiveness would be $17.78 and above the threshold for acceptance. If it was assumed that the 6 remaining manufacturers were the largest of the 24 manufacturers and consumed 3 times this amount (33.75 ODP-t), the cost-effectiveness would have been $5.93 and below the MLF threshold of $6.23.

1714. In the absence of specific CFC consumption information for the 6 remaining manufacturers, the cost-effectiveness was assessed as probably within the threshold for acceptance.

8.6.7.3 Assessment of sustainability of project outcomes

8.6.7.3.1 Financial resources

1715. The financial resources were adequate to complete the project, and to even have residual funds remaining in the end for additional training in the USA. The expenditure on trials ($6000) was well below the level granted ($125,000), presumably because Trademarket was able to operate in-house which was more cost-effective than the original budget. On the other hand, only $75,000 was approved in the grant for equipment, but expenditure was $200,079. The reason for the large over-run between budget and expenditure for the equipment was not explained. It seemed fortunate that the over and under-estimates in the different categories cancelled each other out, and the overall expenditure was similar to the budget.

1716. The funding achieved its objective by eliminating the use of ODS for flexible foam production. However, once the project was completed, the major factor that affected sustainability of flexible foam production in Kazakhstan was the ability of the manufacturers to produce flexible foam more cost effectively than imports from Russia. This proved to not be the case and flexible foam imports from Russia bankrupted most of the Kazakhstan manufacturers.

1717. There was no evidence that UNDP undertook "what-if" scenarios to determine the maximum cost of production of flexible foam in Kazakhstan in order for it to remain competitive with Russian imports. Did UNDP know that the Russian manufacturers were using a cheap production method that used also methylene chloride but without the use of LIA? If these production scenarios had been undertaken, perhaps the decision would have been made to avoid the LIA component in Kazakhstan, which would have reduced the cost of foam production and possibly improved its competitiveness and sustainability in the market.

8.6.7.3.2 Socio-political

1718. There were no socio-political risks that were assessed as more likely to jeopardize the sustainability of the project than the cost of production.

1719. There was no evidence that Kazakhstan investigated subsidies or other such measures to reduce the cost of local flexible foam production, in the interests of maintaining a local market and employment opportunities. The consumer will tend to purchase the lowest price flexible foam products on the market, and whether they are locally made or imported is generally immaterial.

8.6.7.3.3 Institutional framework and governance

1720. There were no institutional and governance risks that were assessed as more likely to jeopardize the sustainability of the project than the cost of production. Since the sustainability of the results of the project was related mainly to the price of production, there are no legislative,

[271] MLF. 2001. Final Report on the Evaluation of Foam Projects. UNEP/OzL.Pro/ExCom/33/6. Table 12 on page 18.

policy or government structures that could have been improved to have avoided the bankruptcy of the manufacturers.

8.6.7.3.4 Environmental

1721. The funding achieved its objective by eliminating the use of ODS for flexible foam production. From an environmental perspective, no use of CFCs is the same as the use of methylene chloride or bankruptcy.

8.6.7.4 Catalytic role

1722. There was some potential for a catalytic or replicative effect as the Final Implementation Report mentioned that the Trademarket as a stakeholder in the project would serve all manufacturers with formulation development and property testing, '*…also the non-eligible ones*.' The number of non-eligible manufacturers was not quantified.

1723. Trademarket commented that after the project had been completed, most of the companies went bankrupt as they were unable to compete with cheap flexible foam imports from Russia. This implied that there were companies that were not part of the project and that remained viable in the marketplace, which suggested that there may have been some replicative effect as a result of the this GEF project.

8.6.7.5 Achievement of outputs and activities

8.6.7.5.1 Delivered outputs

1724. The project transitioned a systems house / manufacturer and 5 other manufacturers to non-CFC production of flexible foam by implementing methylene chloride / LIA technology over a 2 year period. The project:

- Established a technical centre on the Trademarket site to service beneficiary and non-beneficiary manufacturers with formulation development and property testing;
- Installed a semi-automatic boxfoam manufacturing unit that was used for training in the use of CFC-free formulations and safe operating procedures;
- Trained the manufacturers on how to formulate the blends for flexible foam production;
- Trained the manufacturers on how to safely operate the semi-automatic production equipment;
- Ensured that equipment was commissioned and certified by the provider of the equipment; and
- Renovated and relocated the Trademarket semi-automatic boxfoam manufacturing unit to a new site.

1725. The project was timely and useful. The GEF funding improved occupational health & safety (OH&S) as the workers reported less breathing problems than with the old system, and the chemicals were more precisely measured. The approach used by UNDP was appropriate as it used the expertise of Trademarket as a systems house to economically transfer technology and advice to its manufacturing clients.

8.6.7.5.2 Awareness about ODS, ODS substitute technology, and strengthening of institutional capacities for dealing with ODS phase-out

1726. As a result of UNDP and NOU meetings prior to the project, the system house and the manufacturers were aware of ODS and alternative technology for blowing flexible foam which were under consideration[272], such as the advantages and disadvantages of methylene chloride, acetone, AB technology, pentane and liquid carbon dioxide. Chemical modifications to the formula were discussed, such as the advantages and disadvantages of extended range polyols and additives. Alternative manufacturing technologies were discussed, such as the advantages and disadvantages of the E-Max process, accelerated cooling systems and variable pressure systems. This resulted in the selection of the methylene chloride process because of its relative

[272] Project Proposal, 24 December 1999.

simplicity and relatively low capital cost.

1727. The team assessed that the stakeholders were aware of the need to eliminate ODS use, and the range of technologies and processes that were available to replace the ODS technology.

1728. After the project finished and on a broader scale, the NOU carried out Awareness Raising workshops in 2005 and 2006 that targeted at the general public and industry, which were reported by the newspapers, radio and TV. Contests were held on the Ozone Day, there were posters by children, and essays on ozone and climate change issues. A brochure was published called "*Ozone Story*". T-shirts, caps, and pens with UNEP and OLP logos were distributed. It is possible that the systems house and the manufacturers became more aware of ODS and its impact on the ozone layer as a result of this NOU programme.

8.6.7.5.3 Authority / credibility, necessary to influence policy and decision-makers

1729. The project leaders, which consisted mainly of the NOU, UNDP consultant, representatives from the systems house and a national consultant, were assessed as having the necessary expertise, knowledge and technical skills that encouraged the adoption of methylene chloride technology by the five manufacturers as a replacement for CFCs used in flexible foam production.

8.6.7.6 Assessment of monitoring and evaluation systems

8.6.7.6.1 Monitoring and evaluation design

1730. The envisaged milestones for project monitoring were as follows: Project Document submitted to beneficiary (month 3); Project document signature (6); Completion of survey (9); Training workshops (12); Equipment installation (24); Training Testing and Trial Runs (33); Commissioning (Certificates of Completion) (36); Submission of project completion report (42).

1731. The M&E design did not include information on who would monitor and report on achievements of these milestones.

8.6.7.6.2 Monitoring and evaluation plan implementation

1732. UNOPS, on behalf of UNDP, was required to oversee the implementation of this project. Local coordination will be through a local foam expert and the National Ecology Centre for Sustainable Development of the Republic of Kazakhstan, Ministry of Environment.

1733. Mr Veenandaal as the international consultant maintained close communications with Mr Kuznetsov who was the local consultant that was a technical expert in foam production and who spoke good English. Both worked in close collaboration with Mr Vladimir Fomin at Trademarket. In this way, both consultants were able to pool their expertise and suggest solutions to overcome difficulties that arose during the implementation of the project.

1734. The project was implemented in less time (2 years) than originally anticipated (3 years), mainly because there were fewer stakeholders (the systems house plus five manufacturers) than originally envisaged (the systems house plus 24 manufacturers). Fewer participants resulted in less training time, fewer inspections of installed equipment, the elimination of the workshop, and less time trialling the equipment.

1735. The project was therefore implemented mainly by the UNDP/UNOPS consultant and the local consultant, in collaboration with the director of Trademarket.

8.6.7.6.3 Budgeting and Funding for monitoring and evaluation activities

1736. A sum of $15,000 was budgeted for an international foam expert to undertake initial and follow-up visits. A sum of $5,000 was budgeted for a local foam expert to *inter alia* undertake initial and follow-up visits. The expenditure was $34,194 for the activities of both consultants.

8.6.7.6.4 Long-term monitoring

1737. No long-term monitoring was envisaged in this project.

8.6.7.7 Assessment of processes that affected attainment of project results

8.6.7.7.1 Preparation and readiness

1738. The assessment team found no evidence to show that UNDP/UNOPS had tried to predict in

advance which foam-producing companies were likely to go bankrupt, perhaps on the basis of production procedures, product insulation criteria, financial viability or other factors.

1739. Trademarket reported that most of the companies went bankrupt when they could remain viable in the face of imports of the same foam products from Russia, which suggested that the financial viability of some of the companies was marginal at the start of the sub-project and therefore they should not have received funding. The fact that 75% of the companies went bankrupt before the project started should have heightened the need to undertake a financial viability test on the remainder.

1740. On this basis, the Project was assessed as satisfactorily prepared but more work could have been carried out as described above.

8.6.7.7.2 Country commitment and motivation

1741. Kazakhstan was assessed as fully committed to this project as CFCs were replaced with zero ODP technology for foam production, which eliminated the potential for damage to the ozone layer. Kazakhstan was assessed as motivated to achieve the results, as the project was completed sooner than expected.

8.6.7.7.3 Stakeholder involvement

1742. The most important stakeholders were the system house; the manufacturers (systems house plus 5) of rigid foam; the local consultant (Mr Denis Kuznetsov) and the international consultant (Mr Bert Veneendaal) for technical advice; the manufacturers of the equipment for installation, technical advice, and training; and the NOU.

1743. The project involved the relevant stakeholders for information sharing, consultation and participation and in doing so, it made use of the skills, experience and knowledge of key national and international organisations, regional departments and enterprises in Kazakhstan. These included UNDP locally and international consultants, and the customs committee (for equipment clearance).

8.6.7.7.4 Financial planning

1744. There were $16,390 remaining out of the grant approved of $264,000 which was earmarked to fund a study tour to the United States for personnel in the foam industry from Kazakhstan to undertake training in the production of flexible foam in cold conditions. The financial planning was for expenditure of funds in the project was therefore assessed as satisfactory.

1745. There was no evidence that UNDP undertook “what-if” scenarios to determine the maximum cost of production of flexible foam in Kazakhstan in order to use this as a guide to determine the cost-effectiveness of any procedures relative to the cost of Russian imports. If these production scenarios had been undertaken, perhaps the decision would have been made to avoid the LIA component in Kazakhstan, which would have reduced the cost of foam production and possibly improved its competitiveness and sustainability in the market.

8.6.7.7.5 UNEP / UNDP supervision and support

1746. Mr Veenandaal as the international consultant maintained close communications with Mr Kuznetsov who was the local consultant that was a technical expert in foam production and who spoke good English. Both worked in close collaboration with Mr Vladimir Formin (General Director) at Trademarket. In this way, both consultants were able to pool their expertise and suggest solutions to overcome difficulties that arose during the implementation of the project. The UNDP supervision and support was therefore assessed as satisfactory.

8.6.7.7.6 Co-financing and project outcomes & sustainability

1747. There was no co-finance provided in this project. Co-finance may have improved the prospects for sustainability since each of the companies would have had a greater personal stake in survival in the market.

8.6.7.7.7 Project implementation delays and impact on project outcomes & sustainability

1748. The project was implemented in less time (2 years) than originally anticipated (3 years), mainly because there were fewer stakeholders (the systems house plus five manufacturers) than

originally envisaged (the systems house plus 24 manufacturers). Fewer participants resulted in less training time, fewer inspections of installed equipment, the elimination of the workshop as this was no longer necessary, and less time spent trialling the new equipment. There were therefore no delays in project implementation.

1749. The prospects of sustainability were assessed as being influenced mostly by the cost of production rather than other factors such as the time for implementation.

8.6.7.8 Sub-Project Rating

KAZ/00/G34 - Elimination of the use of CFCs at 25 manufacturers of flexible foam enterprises (UNDP/UNOPS)		
Criterion	**Evaluator's Summary Comments**	**Evaluator's Rating**
Attainment of project objectives and results Sub criteria (in yellow below)	See comments below	S
Effectiveness	The facilities were converted to CFC-free technology thereby avoiding further CFC consumption	S
Relevance	Conversion to non-ODS technology is consistent with minimising the detrimental effect of ODS on the ozone layer	HS
Efficiency	Difficult to calculate with certainty as the reduction in manufacturers involved in the project by 75% was not accompanied by a similar reduction in the quantity of ODS to be phased out.	MS
Sustainability of Project outcomes (overall rating) Sub criteria (in yellow below)	See comments below	S
Financial	Some unexplained variances in some line items, but overall the expenditure remained within budget and the residual was earmarked for specialized training in the US	S
Socio-Political	Regional production and imports to Kazakhstan were the main events that eliminated the prospects of sustainable production in Kazakhstan	S
Institutional framework and governance	Accepted as not an influence on the outcomes of this project	S
Environmental	Conversion to CFC-free technology was achieved, and some went bankrupt	S
Achievement of outputs and activities		S
Monitoring and Evaluation (overall rating)	See below	

KAZ/00/G34 - Elimination of the use of CFCs at 25 manufacturers of flexible foam enterprises (UNDP/UNOPS)		
Criterion	**Evaluator's Summary Comments**	**Evaluator's Rating**
Sub criteria (in yellow below)		
M&E Design	Milestones established but means of monitoring and reporting were not described	S
M&E Plan Implementation (use for adaptive management)	Implemented efficiently by consultants (international and national) and the systems house, good communications	S
Budgeting and Funding for M&E activities	Not determinable from the documentation provided	MS
Catalytic Role	No categorisation required	
Preparation and readiness	Satisfactorily prepared but more work could have been done to avoid funding those that went bankrupt and to test if the proposed production system would be cost effective in the face of cheaper imports	S
Country commitment and motivation*	Kazakhstan was fully committed to this project	HS
Stakeholders' involvement	The project involved the relevant stakeholders and made use of the skills, experience and knowledge of key national and international organisations	S
Financial planning	Expenditure remained within budget. More could have been done to see if the planned ODS-free technology would be competitive with imports of products that contained flexible foam	S
UNEP supervision and support**	UNDP/UNOPs representative liaised closely with the national consultant and the systems house	S
Overall Rating		S

Highly Satisfactory (HS); Satisfactory (S); Moderately Satisfactory (MS); Moderately Unsatisfactory (MU); Unsatisfactory (U); Highly Unsatisfactory (HU);
*Motivation replaced TOR '*driveness*'; **Support replaced TOR 'backshopping'

8.6.8 *KAZ/00/G35 Replacement of CFC-113 in the cleaning of oxygen manufacturing equipment at Pavlodar (UNDP/UNOPS)*

8.6.8.1 *Introduction*

1750. Pavlodar Chemical Company (PCC) is a former chemicals weapons production facility[273] that today produces a range of civilian chemicals including caustic soda, chlorine, sodium hypochlorite, ammonium chloride, lubricating oil additives, flotation agents, antifreezes, phenol-formaldehyde resins, and plasticizers for PVC resins.

1751. Parts of this plant are now owned by private companies and investors, including JSC "Kaustic"

[273] Bozheyeva, G. 2000. The Pavlodar Chemical Weapons Plant in Kazakhstan: History and legacy.

(since 2007) and Reagent-Vostok for the operational parts of PCC. Russian funding of the plant ceased in 1992 after Kazakhstan became independent. The main chlorine production line was closed in 1993 because it was based on mercury electrolysis, and it was forced to buy chlorine more expensively for synthesising other chemicals from the Russian Federation. Many of PCC's products are now made more cheaply in Russia. The plant was closed twice due to bankruptcy from 1996 to 2000, and more recently in 2007 until part of it was bought by Kaustic.

1752. The project approved in July 2000 and ended in October 2006 when a certificate of completion was issued by Mr Bert Veenendaal (international consultant) on behalf of UNOPS for equipment that was installed several years earlier. The GEF budget of $106,920 financed the replacement of 6 ODP-tonnes of CFC-113 with the solvent methylene chloride. Methylene chloride was used to remove oil contaminants, including acetylene from various oxygen-producing systems that, if not removed, could cause an explosion. The grant also paid for a machine to recover and reclaim the methylene chloride.

8.6.8.2 Attainment of objectives and planned results

8.6.8.2.1 Effectiveness

1753. Methylene chloride was selected as the most suitable solvent. Equipment for introducing, storing, handling, recovering and ensuring the evacuation of methylene chloride was supplied and installed. However, the equipment has not been used because the facility operations were suspended until 2010 pending the installation of new oxygen-generating equipment.

1754. Once the facility is again operational, the methylene chloride equipment will need to be certified before it can be used. Certification fees were estimated to be about twice the project budget and, moreover, they were not included in the project budget.

1755. As a result of the lack of certification, and later the temporary shutdown of the facility for alterations, the effectiveness of the installed equipment in eliminating ODS has not been tested and verified. Training in the safe management of methylene chloride was paid by the project but has yet to be carried out.

1756. The high certification fees were described as a large financial challenge by Kaustic. The evaluation team concluded that this equipment may never be put into operation unless company or other funds are found for its certification.

8.6.8.2.2 Relevance

1757. The elimination of 6 ODP-tonnes of CFCs is relevant for avoiding depletion of the ozone layer.

1758. More generally, the elimination of the use of ODS in flexible foam production in Kazakhstan was also consistent with the objectives of the Vienna Convention and the Montreal Protocol, which *requires Parties to take appropriate measures in accordance with the provisions of this Convention and of those Protocols in force to which they are party to protect human health and the environment against adverse effects resulting or likely to result from human activities which modify or are likely to modify the ozone layer*[274].

1759. The GEF established in 1995 an Ozone Layer Depletion Focal Area in response to the Montreal Protocol. The Focal Area has the strategic objective of protecting human health and the environment by assisting countries to phase out their consumption and production of ODS, to prevent emissions of ODS, and to encourage the uptake of alternative technologies and practices according to a country's commitments under the Montreal Protocol. The financial interventions in the GEF Focal Area contribute to the return of the ozone layer to pre-1980 ozone levels, which is expected by 2065.

1760. Most recently, the dual capability of ODS to both reduce ozone and to have a detrimental impact on the climate have been described[275]. Global ODS consumption in 1989 was equivalent to about 9,200 million tonnes (9 Gt) CO_2-eq/year, which was reduced to about 1,870 million tonnes (1.8 Gt) CO_2-eq/year in 2007 as a result of ODS phase-out activities under the Montreal Protocol. This reduction of about 7 Gt CO_2-eq/year was at least three times greater than the Kyoto

[274] Handbook for the Vienna Convention for the Protection of the Ozone Layer - 7th Edition (2006). Article 2: General Obligations.

[275] Velders, J.M., Andersen, S.O., Daniel, J.S., Fahey, D.W. and M. McFarland. 2007. The Importance of the Montreal Protocol in protecting climate. http://www.pnas.org/content/104/12/4814.abstract

Protocol's reduction target (about 1-2 Gt CO_2-eq/year in 2008-2012), demonstrating that the global ODS reductions achieved so far have already yielded a larger climate benefit than the current Kyoto Protocol target.

1761. The actions taken by Kazakhstan to eliminate ODS in the solvent sector was therefore relevant to further protection of the ozone layer (Montreal Protocol) and relevant to reducing the impact of radiative forcing of the climate (Kyoto Protocol).

8.6.8.2.3 Efficiency

1762. The cost-effectiveness of the project to replace CFCs with methylene chloride at the PCC was $17.82 ODP-kg per year, based on a project cost of $106,920 to phase out the consumption of 6 ODP tonnes of CFCs per year. The MLF (2001) reported the average actual cost-effectiveness of nine solvent projects completed in developing countries was $14.92 ODP-kg per year[276]. The cost-effectiveness of the sub-project to phase out the use of CFCs at PCC was assessed as about 20% more expensive than the average actual cost-effectiveness of the conversion to CFC-free technology for projects financed in developing countries by the MLF. The cost-effectiveness of the project was however within the MLF cost-effectiveness threshold for project funding of $19.73 ODP-kg per year[277]. Note that if the certification fees were to included that were estimated to cost $180,000 the project would not have been cost-effective.

8.6.8.3 Assessment of sustainability of project outcomes

8.6.8.3.1 Financial resources

1763. Inadequate assessment of the financial resources needed to complete this project continues to threaten the ability of putting this equipment into operation.

1764. UNDP/UNOPS did not formulate the study correctly in order to precisely determine its scope and costs. The Kazakhstan office of UNDP reported that they did not have the economic and financial expertise to contribute to such a study at the time of project design.

1765. "*Certification*" was listed as in the third (and last) phase in the schedule of activities in the Project Document. The implementation time for certification was estimated to be 3-months. However, "*Certification*" was not specifically mentioned in the budget of the Project Document, and therefore no fees were included for this purpose, which appears to be an error in project formulation. Consequently, certification was never undertaken as there was no budget, even though it was listed as an item that required completion.

1766. However, the chairman of Kaustic signed the Certificate of Completion in which Kaustic agreed to take responsibility for "*…starting up the equipment…*" in exchange for payment of $6,000 remaining in the project budget. The chairman wrote to UNDP on 25 January 2007 confirming installation of the equipment, including water and electrical connections, and requesting payment of the agreed sum of $6,000. UNDP authorised payment in February 2007.

1767. According to Kaustic, the agreement for $6,000 as final payment was accepted on the basis that it included everything in the project except the certification of the equipment which was still needed. There was still a strong expectation by Kaustic that certification would be paid by UNDP.

1768. In 2009 when this evaluation was undertaken, Kaustic reported that the company expected the fees for certification to come from the sub-project, since the costs of certification were estimated by the company to be about $180,000 (almost twice the project budget) and therefore a financially significant component of operationalising the equipment. Certification fees were not mentioned in the aforementioned correspondence between Kaustic and UNDP, which indicated that this issue arose after the Certificate of Completion was signed.

1769. Kaustic explained at the evaluation meeting that all modifications to the chemical facility required certification. It is evident that the fees for certification were not included in the project, and as a result the equipment cannot be brought into operation.

1770. In addition, technology transfer and training were not carried out ($20,000 budgeted). Kaustic

[276] MLF. 2001. Final Report on the Evaluation of Solvent Projects. UNEP/OzL.Pro/ExCom/35/12. Table 10 on page 18.
[277] MLF. 2001. Op cit.

reported that it did not receive the $20,000 and reported that UNDP kept these fees and did not complete the training in return.

1771. The absence of a fee for the costs of certification in the budget was assessed as the most likely cause of failure of the certification requirements, which itself was the result of inaccurate project formulation by UNDP. This action reduced the prospects of the implementation and sustainability of ODS-free oxygen-producing operations at the Kaustic facility.

8.6.8.3.2 Socio-political

1772. The NOU and the government did not raise the issue of the lack of implementation of the solvent equipment with the evaluation team prior to their visit to Kaustic. The NOU representative that accompanied the evaluation team on the visit to Kaustic stated at the meeting that the implementation of the project was the responsibility of UNDP/UNOPS and not the NOU.

1773. This indicated there was no action that the government had undertaken to resolve the situation and, moreover, the government viewed the lack of implementation as a commercial problem for Kaustic.

8.6.8.3.3 Institutional framework and governance

1774. The NOU has the responsibility of facilitating communication between the implementing agency and local authorities, when this becomes necessary for project implementation. Certification according to Force Majeure Industry standards was expected to be performed by a specialised research centre that was accredited to conduct '*sanitary, technical and epidemiological tests*'.

1775. The NOU did not describe any action that had been taken to facilitate such communication between Kaustic, UNDP and this specialised research centre. For this reason, the institutional framework and governance of this project was assessed as weak and severely detrimental to the prospects for sustainability of the phase out of CFCs.

8.6.8.3.4 Environmental

1776. So far there has been no environmental impact on the ozone layer as a result of the lack of certification and lack of operation of this equipment, as the facility is undergoing a shut down pending installation of ancillary equipment. However, even if the facility were operational, the equipment for the ODS-free operation could not be brought into operation because it is not certified.

1777. Therefore, in the short term there has been no impact on the environment due to the use of CFCs for solvent cleaning. However, when the facility is operational, it is unlikely that Kaustic will revert back to the use of CFCs as they indicated that the company will pay for the certification if they cannot get external financial support.

1778. There was an awareness of the potential impact of the project on the environment. The Project Document required Kaustic to contact local authorities: Ministry of Natural Resources and Environmental Protection; the Regional department of Environmental Protection, Pavlodar; and the Regional department of Emergency and Civil Defence, Pavlodar. These contacts were required to determine whether permits were required for the storage, use and disposal of methylene chloride.

1779. There was no specific requirement for the Kaustic to contact the certification agency in regard to the certification of the methylene chloride storage and purging equipment, which was assessed as an error in project formulation.

8.6.8.4 Catalytic role

1780. There was no potential for catalytic or replication effect as a result of this project, as this was the only facility in Kazakhstan where oil contaminants were required to be removed from various oxygen-producing systems during the production of chemical products.

8.6.8.5 Achievement of outputs and activities

8.6.8.5.1 Delivered outputs

1781. The project delivered some timely and useful outputs, mainly an increase in knowledge of CFC-

replacements for removing oil contaminants including acetylene from various oxygen-producing equipment, and the implementation of one of the replacements namely methylene chloride.

1782. Outputs that were not delivered include knowledge on how to safely remove and store methylene chloride from the oxygen-producing equipment once the oil contaminants have been removed, and how to check that all the methylene chloride has been removed before starting up the oxygen production. This is important because methylene chloride has a potential lower explosive limit of 12% and an upper explosive limit of 19% in the vapour phase. Therefore, it is important to test and verify that these concentrations are not present anywhere in the oxygen producing part of the equipment before start up is allowed.

1783. The project included inert gas purging equipment and a portable sampling instrument to measure the concentration of methylene chloride in the equipment and in the exhaust of the purged gases.

1784. As a result of this project, and because of the potential for explosion, Kaustic was required to carefully re-assess production procedures and to re-train production personnel in the safe operation of the new procedures involving the use of methylene chloride.

1785. The practical knowledge of introducing, storing, handling, recovering and ensuring the evacuation of methylene chloride was intended to be one of the delivered outcomes of the project, but these outcomes have not been delivered because the equipment has not been certified and is therefore not operational. Although the programme was timely and useful, the deliverable outcomes as a result of this project were therefore assessed as unsatisfactory.

8.6.8.5.2 Awareness about ODS, ODS substitute technology, and strengthening of institutional capacities for dealing with ODS phase-out

1786. Kaustic reported that the company understood the value of the project, which was to eliminate the use of CFC-113 it its operations. Upon completion the company would then operate without damage to the ozone layer. Kaustic informed the evaluation team that it was a requirement of the government and local regional authorities to be ODS-free. Kaustic acknowledged that to achieve this goal, technical and financial support were both required.

1787. The Project Document that was finalised in December 1999, discussed the advantages and disadvantages of various solvents to replace CFCs for use in the oxygen-producing equipment. These included methylene chloride, trichloroethylene and n-propyl bromide (n-PB). It is presumed that Kaustic was involved in the selection of the solvent, although this might not have been the case since the company was surprised by the arrival of the equipment. The result was that methylene chloride was selected and n-PB and trichloroethylene were rejected mainly because of safety concerns and cost.

1788. The stakeholders were assessed as definitely aware of the need to eliminate ODS use, and probably aware of the range of technologies and processes that were available to replace the ODS technology.

1789. The institutional capacity to finalise the project was weak, because there was no involvement of the certification body which is an important element in the chain of events that is needed to achieve a successful outcome. The stakeholders were assessed as contributing to this weakness, as Kaustic did not raise the importance of certification during the formulation of the project, the NOU-government did not make the linkages with the relevant agencies to have this as a line item included in the budget, and UNDP did not include the certification fees when the project was formulated.

1790. There were a number of 'normative laws' and local legislation that required such approvals. As a chemical company, Kaustic was well aware of the national and regional environmental and safety requirements, as it had built up experience with much larger projects. The assessment team was shown documents related to an international project that needed permits for equipment that cost $30 million and certification fees of $60 million. It was not uncommon for the fees to be much more than the equipment, which was the case with mercury detection equipment which was delivered by Japan.

1791. Kaustic reported that UNDP undertook a mid-term evaluation of the project and that at that stage Kaustic reported on the requirement for certification and the fees required. Kaustic

reported that there was no response from UNDP as a result of the discussions. The assessment team was not provided with a copy of the mid-term report to allow further evaluation.

1792. Kaustic informed the assessment team that it notified UNDP that certification was important but it had not been included, and that this needed to be provided. However, it is likely that this notification to UNDP occurred after the project and budget had been approved by the GEF, and therefore it would have been difficult for UNDP to make an amendment to the budget at that stage.

8.6.8.5.3 Authority / credibility, necessary to influence policy and decision-makers

1793. The project leaders, which consisted of mainly the UNDP consultant, representatives from the Kaustic and representatives from equipment providers, and the NOU were assessed as having the necessary expertise, knowledge and technical skills suitable for the installation of the methylene chloride technology that was used as a solvent to replace CFCs in the production of oxygen.

8.6.8.6 Assessment of monitoring and evaluation systems

8.6.8.6.1 Monitoring and evaluation design

1794. There were three activities described in the Project Document schedule:

- *Preparation*: GEF approval, procurement preparation, vendor selection
- *Installation*: Customs clearance, installation
- *Start up*: Trails, training, equipment start up, certification[278], safety audit, Certificate of Closure

1795. Some of these activities in the budget could be directly and clearly linked to the elements in these three activities, but notably missing from the budget is identification of "certification" as a line item, and an estimated fee for certification. In the schedule of activities, certification is shown as requiring 3-months for completion.

1796. Unlike other Project Documents, there was no separate "Monitoring and Evaluation" design in the Project Document that detailed the transition of Kaustic oxygen-producing procedures to ODS-free technology. The UNDP M&E design was therefore assessed as unsatisfactory.

8.6.8.6.2 Monitoring and evaluation plan implementation

1797. Unlike other Project Documents that identify a separate "Monitoring and Evaluation" section, no such section exists in this document for the transition of Kaustic oxygen-producing procedures to ODS-free technology. As a result, there is no identification of milestones for each of the three activities, who would be responsible for monitoring and reporting and the time period for carrying out these activities. UNDP M&E design implementation was therefore assessed as unsatisfactory.

8.6.8.6.3 Budgeting and Funding for monitoring and evaluation activities

1798. There was no separate budget for monitoring and evaluation activities identified in the Project Document. The UNOPS fees were shown as 8% of subtotal of the capital and training costs ($7,900). There was a contingency fee of 10% of the capital costs ($9,000).

1799. The assessment team was not provided with a copy of the Final Implementation Report that showed expenditure relative to budget, and therefore it was not possible to determine if there was any expenditure on M&E activities.

8.6.8.6.4 Long-term monitoring

1800. No long-term monitoring was envisaged in this project.

8.6.8.7 Assessment of processes that affected attainment of project results

8.6.8.7.1 Preparation and readiness

1801. Kaustic reported that the equipment arrived unexpectedly, suggested that there was no

[278] Underlined for emphasis in this report but not in the original Project Document

difficulties experienced by the team in the selection of vendors, payment for the equipment, and its import into Kazakhstan.

1802. Originally the vendors of the equipment were intended to install it, but this proved to not be the case. Kaustic reported that the company took responsibility for installation as they acknowledged that their staff and expertise were available for this task, and the fee for the installation being requested by the vendors would have resulted in the budget being exceeded. This indicated a lack of communication in the procurement process, which resulted in a lack of preparation for the installation phase. For this reason, the installation phase was assessed as unprepared.

1803. As described above, there was no preparation for certification, even though it was identified in the activity schedule. However, it was not identified in the budget, which would have required a provision of about $180,000 based on an estimate of the certification fee provided by Kaustic during our evaluation visit. For this reason, the certification phase was assessed as unprepared.

1804. Important training and safety tests were due to be carried out, once the equipment was certified and operational. As certification has not proceeded, these important elements in the project have not been completed. For this reason, the lack of training of personnel and lack of safety tests were assessed as unprepared.

1805. The performance of UNDP as assessed as unsatisfactory in preparation and readiness, taking into account that the equipment was installed by Kaustic instead of the vendors as originally envisaged, and that there was no preparation for equipment certification, personnel training and important safety tests.

8.6.8.7.2 Country commitment and motivation

1806. In a broader context, the project was carried out a time when CFCs could still be imported. The ban on the import of CFCs and products that contain them did not come into force until Decree No 617 was adopted on 22 June 2005. It would have been preferable to have eliminated all options for imports early in the execution of this project in order to encourage Kaustic to focus solely on CFC-free methods for oxygen generation, whereas without the ban there would have been an option to import.

1807. Kazakhstan is motivated toward ozone layer protection, but it falls short of translating this motivation into action that effectively protects the ozone layer. Adoption of ozone layer protection legislation is continually delayed. In this project, there were other factors that prevented implementation of the equipment, but there were no reports of any follow up and action by Kazakhstan to help resolve the certification difficulties.

8.6.8.7.3 Stakeholder involvement

1808. The main stakeholders involved where the UNDP consultant, representatives from the Kaustic and representatives from equipment providers, and the NOU. They were assessed as having the necessary expertise, knowledge and technical skills that encouraged the installation of methylene chloride technology that was used as a solvent to replace CFCs in the production of oxygen.

1809. The certification body or agency, which was described by Kaustic as a specialised research centre that was accredited to conduct '*sanitary, technical and epidemiological tests*', was not included as one of the stakeholders in those listed in the Project Document. This omission resulted in the certification of equipment being omitted from the budget of the project, which is probably the reason that this activity was never carried out.

1810. The project was assessed as having an incomplete list of stakeholders which prevented the operation of the equipment, the training of personnel and the conduct of safety tests.

8.6.8.7.4 Financial planning

1811. In the Certificate of Completion, UNDP reported that expenditure was $6,000 less than budgeted, and proposed that Kaustic use these funds to install the equipment. This indicated that the project expenditure was timely and within budget, and therefore financial planning and control was assessed as satisfactory.

1812. However, the cost of equipment certification was not separately identified in budget, although it

was listed as a scheduled activity that was expected to take 3 months to complete. On several occasions, Kaustic raised the problem of certification and highlighted the need for funding for the specialised research centre to undertake the equipment certification.

1813. UNDP was not able to address this aspect, even when Kaustic contended that they raised the issue of certification when UNDP undertook the mid-term evaluation. This aspect of financial planning by UNDP was assessed as unsatisfactory.

8.6.8.7.5 UNEP / UNDP supervision and support

1814. Supervision and support are important elements that contribute to the success of a project, and are particularly important when problems arise and timely solutions are required to keep a project on track.

1815. Kaustic reported to the evaluation team that they voiced concern on several occasions that the certification of equipment was a key aspect that had yet to be addressed in this project. According to Kaustic, this issue was again raised in the mid-term evaluation but there was no action by UNEP. According to Kaustic, the President wrote a letter to UNDP requesting that this issue be addressed through provision of funds, but there was no action by UNDP.

1816. In the UNOPS Certificate of Completion Report dated 26 October 2006 (several years after the equipment was installed), the representative of UNDP stated that "*…the equipment has not been started up yet. Kaustic will do so on its own responsibility. UNOPS will disburse in exchange and as compensation for start-up costs the remainder of the available funds which is (sic) estimated to be $6000. The use of CFC-113 has been discontinued and the use of methylene chloride started, thus meeting the objective of the project.*"

1817. None of the comments made by Kaustic at the evaluation meeting were reported by the NOU after the meeting to be inaccurate, and therefore the evaluation team assessed Kaustic's remarks in the meeting as being a reasonable account of the problems surrounding certification of the installed equipment.

1818. The UNOPS Certificate of Completion Report, which basically handed over the remainder of the funds to Kaustic, and then stated in no uncertain terms that Kaustic was "*…on its own…*" most likely summed up the level of support given to Kaustic over this period. It was likely that this seemingly insular attitude by UNDP toward Kaustic was generated as a result of UNDP's error in formulating the Project initially, in which there was no funds were budgeted for certification at the outset and this was impossible to correct as the time in the project passed.

1819. For the reasons described above, UNDP supervision and support was assessed as unsatisfactory.

8.6.8.7.6 Co-financing and project outcomes & sustainability

1820. There was no official co-financing in this project. However, Kaustic installed the equipment and undertook other activities for a modest fee of $6,000 which suggested that some undocumented in-kind co-financing had been provided by Kaustic. Furthermore, Kaustic stated that if the project could not find the funds for certification, they will find them internally. Provision of internal funds in the future will increase Kaustic's in-kind and not-in-kind financing of this project.

1821. Such co-finance would have increased Kaustic's ownership and commitment to the equipment and thereby contributed to the sustainability of the project.

8.6.8.7.7 Project implementation delays and impact on project outcomes & sustainability

1822. There was a delay of several years after installation of the equipment and the issuance of the Certificate of Completion by UNDP. During this time and for several years afterwards until the visit by the evaluation team, the equipment remained uncertified and unused. It was also unused because of the suspension in operations of the facility pending the installation of new equipment. The facility is expected to be operational again in 2010.

1823. The delay in certification has resulted in a missed opportunity for 1-2 years of operations of the methylene chloride equipment, and the operational experience that would have resulted from these operations. As a result, the equipment is untested, no safety tests have been put in place and the staff have not been trained. These outcomes in the project are missing as a direct result of the lack of certification.

1824. The delays in certification have coincided with a period when the whole plant is not operational. So the impact of the certification delay has been avoided. However, as soon as the plant starts up again in 2010, the lack of certification for the equipment will then be the reason for the lack of operation of the methylene chloride equipment. If Kaustic receives funds from the company budget for certification, then operational down time of this equipment will be avoided. If not, the sustainability of the project is at risk.

8.6.8.8 Sub-Project Rating

KAZ/00/G35 – Replacement of CFC-113 in the cleaning of oxygen manufacturing equipment at Pavlodar (UNDP/UNOPS)		
Criterion	**Evaluator's Summary Comments**	**Evaluator's Rating**
Attainment of project objectives and results Sub criteria (in yellow below)	See comments below	U
Effectiveness	The facility was converted to CFC-free technology but the equipment remains untested and the staff untrained in its operation and safety	U
Relevance	Conversion to non-ODS technology is consistent with minimising the detrimental effect of ODS on the ozone layer	S
Efficiency	Cost-effective without the certification costs, but not cost-effective if they are included. Certification was identified as an activity, but not budgeted	S
Sustainability of Project outcomes (overall rating) Sub criteria (in yellow below)	See comments below	S
Financial	Delivered within budget, with a small residual payment to Kaustic for installation when the equipment providers did not install as agreed	S
Socio-Political	Government has not been active in seeking a resolution from UNDP for the lack of funding for an item in the activity schedule that was not budgeted	U
Institutional framework and governance	Weak institutional framework and governance threatens sustainability of project, unless Kaustic funds the certification cost which alone is expected to be about twice the cost of the project	U
Environmental	There has been no environmental impact from ODS so far, due solely to the down time in the facility for other modifications rather than to the ODS-free operation of the installed equipment	S

KAZ/00/G35 – Replacement of CFC-113 in the cleaning of oxygen manufacturing equipment at Pavlodar (UNDP/UNOPS)		
Criterion	**Evaluator's Summary Comments**	**Evaluator's Rating**
Achievement of outputs and activities		S
Monitoring and Evaluation (overall rating) Sub criteria (in yellow below)	See below	
M&E Design	No separate M&E design	U
M&E Plan Implementation (use for adaptive management)	M&E evaluation ineffective at resolving the lack of certification	U
Budgeting and Funding for M&E activities	Not determinable from the documentation provided	U
Catalytic Role	No categorisation required	
Preparation and readiness	No preparation for equipment certification, staff training, and safety tests	U
Country commitment and motivation*	Kazakhstan was late implementing legislation that banned imports of CFCs, which left open the option to import and to weaken the motivation to complete the project	S
Stakeholders' involvement	Most involved but research centre involved in certification was not involved which was a fatal error in completion of the project	U
Financial planning	Financial proposal was about 30% to the total project cost as certification fees were omitted	U
UNEP supervision and support**	UNDP/UNOPs was weak as there was little effort to resolve the certification difficulty, despite repeated concerns raised by Kaustic	U
Overall Rating		U

Highly Satisfactory (HS); Satisfactory (S); Moderately Satisfactory (MS); Moderately Unsatisfactory (MU); Unsatisfactory (U); Highly Unsatisfactory (HU); *Motivation replaced TOR '*driveness*'; **Support replaced TOR 'backshopping'

8.6.9 KAZ/00/G36 National Halon Management Programme (UNDP/UNOPS)

8.6.9.1 Introduction

1825. The objective was to establish a national Halon Management Programme to provide ongoing access to halon for servicing and maintaining halon fixed-flooding fire protection systems and fire extinguishers. The Project Document[279] stated that the scheme "*…would focus on critical use applications*", which would allow Kazakhstan to eliminate "*…halon for …. non-essential uses* [where alternatives exist] *and to use the reclaimed halon to service only essential uses…",* thereby steadily reducing halon consumption in a planned and effective way.

[279] Prepared by Hisham El Bakry (July 1999) and reviewed by Michael Wilson (Jan 2000)

1826. Prior to the start of the project, the major use of halon 1211 was the aviation industry together with the enterprise in Tynys that made about 2,500 halon 1211 extinguishers for the aviation industry using 11.48 tonnes annually. The Programme would also be useful for Almaty Airport Authority which reported difficulty obtaining supplies of halon. This airport is the largest in Kazakhstan and a regional hub for about 41 airlines.

1827. The Programme would implement operational procedures for the environmentally-safe testing of halon-containing equipment, as well as equipment and procedures for safe halon recovery, storage and recycling. A survey would be carried out to document the use of halon in each sector, leading to accurate reporting of halon consumption. Training workshops would improve the skills of fire protection personnel, company staff selling alternatives, and recovery/reclaim technicians. Information would be provided to users of halon on alternatives suitable for different applications. These activities would be implemented in collaboration with national agencies and other key stakeholders, according to guidance from a steering committee. The committee would also examine the need to introduce halon import and internal use controls. The project would introduce equipment to monitor the quality of the recovered halon and to ensure its safe storage under in leak-proof conditions.

1828. The project was approved in March 2000 and ended in October 2002 when a Certificate of Completion was issued by the UNDP consultant on behalf of UNOPS for equipment and services. The GEF budget of $163,231 was used to finance Kazakhstan's phase out of 101.91 tonnes of halon per year as part of its Halon Management Programme.

1829. The evaluation team discussed the outcomes of this project with staff and stakeholders at the Special Research Centre for Fire Security and Civil Defence (FESD) of the Republic of Kazakhstan. Later the same day we visited the Polygon Research Centre on the outskirts of Almaty which is the site halon recovery and reclamation.

8.6.9.2 Attainment of objectives and planned results

8.6.9.2.1 Effectiveness

1830. In July 1999 the government estimated that there were about 27 tonnes of halon installed in various sectors and locations including the aviation sector, the houses of parliament, the railway station, the national library, the computing centre, the hydro meteorological centre, the regional department of statistics, gas compressor stations (as part of a pipeline?), and other offices.

1831. The hardware delivered as of 19 Oct 2002 was:

- Halon storage tanks (7 x 1000 lb; 6 x 238 lb)
- A halon 1211/1301 Recovery / Recycling station and accessories
- A halon 2402 Recovery / Recycling station, chiller module and accessories
- Air Compressor for both the Recovery / Recycling stations
- 150 kg and 2,000 kg digital weighing scales
- Portable / Bench-top gas chromatograph with computer and software
- Spare parts for 1 year for all equipment
- Installation, commissioning and testing by REMTEC, and equipment certification completed
- Training of two specialists, one engineer and a head of department for the fire service and civil defence in the use of this equipment by REMTEC

1832. A contract was also agreed between UNOPS and the Chief of the FESD for other services which were reported as delivered on 19 Oct 2002:

Survey form:

- Survey Form
- Halon inventory and future needs determined
- Modified survey to suit local requirements
- Halon users database:
- Database software developed for NOU and others to use

- Provided computer, software and laser printer for data storage and analysis
- Database populated with survey data, updated twice per year
- Communications: Personal visits (ongoing and extended to 30 Apr 2003)*
- Communications: Installed telephone line for email and internet
- Halon recovery and recycling centre:
- Equipped the FESD with equipment for halon analysis*
- Equipped the Polygon centre for halon recovery and recycling
- Install used mechanical or hydraulic forklift*
- Halon certification:
- Accredit FESD to National Centre for Standardisation Metrology and Certification*
- Recovery, recycling and reclamation equipment certified by the above Centre
- Register documents with the above Centre*
- Information:
- Brochure on halon recycling*
- Publish information in the fire protection journals and others *
- Published book entitled "*Reduction of the use of halon in Kazakhstan*" by Professor Djumagaliev Ruslan
- Training:
- Identify, select and design fire protection systems using alternatives to halon: For fire protection officials, fire engineers and safety managers;
- Halon decommissioning, installation, certification and maintenance: For the staff and service personnel of in fire protection companies to ensure that both portable halon extinguishers and systems are operational and perform according to their designated design engineering and applicable codes*;
- Educational material on halon management & recycling: Description of the HMP to increase awareness and use of the programme in the market*.
- The * above indicates that there was insufficient information in the communications from UNDP of 19 Oct 2002 and 11 November 2005 to determine whether or not the equipment or activities had been delivered.

1833. As of 11 November 2005, a total of 77.6 tonnes of halon were reported as installed and 13 tonnes collected, which was about 3-times more installed than estimated some 6 years earlier. FESD at our meeting recalled that 85t of halon 2402 had been collected over a 4-year period, which is equivalent to 21.25 t per year. This was about 80% less per year than the amount targeted of 101.9 t per year.

1834. A further 5t of halon was known to be available in enterprises in Kazakhstan but FESD did not want to collect it because of the cost of storage. SFD reported that legislation was not in place that required halon to be recovered, which made the process of collection more difficult. At the meeting the evaluation team requested a copy of the database in order to evaluate the latest information, but so far this has not been provided. Collection of information for the database ceased in 2006. Without access to the database showing data collected over several years, it was not possible to assess whether the Halon Management Plan had been effective in reducing installed halon and in determining the quantity that had been recovered and stored.

1835. The benchmark targets for ODS reduction that were agreed by Kazakhstan in discussion with the Implementation Committee in the Montreal Protocol provided Kazakhstan with an additional 8-9 years to phase out CFCs and halon beyond the year of compliance for developed countries. From 2005 onwards the reports submitted by Kazakhstan to the Ozone Secretariat on the consumption of ODS showed that Kazakhstan remained in compliance with Annex A Group II (halon) substances, which indicated that there was no production or import during these reporting periods. We assessed that the Halon Management Plan had been effective in this regard.

1836. There was no information provided on the impact of the Programme on halon containment practices, testing, and the increased use of halon-free fire fighting systems. Moreover, there was no information on critical use applications, such as a list of those uses that were considered critical because no alternatives had been identified. Conversely, there was no list of non-critical uses, which are those that have replacements for halon and therefore should be phased out. No information was provided on alternatives, and actions that had been taken by Kazakhstan to improve the awareness of these alternatives. The actions of the committee that was established to guide stakeholders were not reported. The evaluation team was therefore not in position to assess the impact of these activities.

1837. There were two specialists, one engineer and a head of department FSED that were trained in the use of the recovery and recycling equipment at the Polygon facility. The two specialists resigned several years ago to join the army and were not replaced. The last change of the filters was August 2003, suggesting that the use of the facility terminated shortly afterwards and therefore it has not been used for 4-5 years. It was not possible to determine if the chromatograph had been used as helium gas was not available when Remtec checked the operation of the equipment. The manual or hydraulic forklift that is required to move the cylinders was not evident at the facility.

1838. The evaluation team concluded that the emphasis in the halon programme had been on collection and storage, and very little on reclamation, quality testing and replacement of halon with alternatives. There were probably some replacements with alternatives for the 85t of halon that had been collected over a 4 year period, but there was no evidence supplied to show the type of alternative and their locations. There was no evidence to show that the Halon Management Plan had been developed, and only parts of it had been actioned. As a result, there was no evidence of a steady reduction in the use of halon in a planned and effective way, as described in the intent of the project. For this reason the effectiveness as assessed as unsatisfactory.

8.6.9.2.2 Relevance

1839. The most common halon in Kazakhstan have ODPs of 6 for halon 2402 and 3 for halon 1211, which means that each kg collected is equivalent to 6 and 3 kg of CFCs respectively. Therefore the project is highly relevant. While acknowledging that this project never intended to completely phase out halon, but rather to collect and replace it where possible, this results in most of the halon being re-installed and ultimately being vented. Best-practice environmentally requires the replacement of halon by alternatives, and then the halon collected is destroyed. That said, this programme was reported to have collected 85 tonnes of halon over a 4-year period, which implied that some of the fire protection systems were replaced by alternatives.

1840. More generally, the recovery of halon in Kazakhstan was also consistent with the objectives of the Vienna Convention and the Montreal Protocol, which *requires Parties to take appropriate measures in accordance with the provisions of this Convention and of those Protocols in force to which they are party to protect human health and the environment against adverse effects resulting or likely to result from human activities which modify or are likely to modify the ozone layer*[280].

1841. The GEF established in 1995 an Ozone Layer Depletion Focal Area in response to the Montreal Protocol. The Focal Area has the strategic objective of protecting human health and the environment by assisting countries to phase out their consumption and production of ODS, to prevent emissions of ODS, and to encourage the uptake of alternative technologies and practices according to a country's commitments under the Montreal Protocol. The financial interventions in the GEF Focal Area contribute to the return of the ozone layer to pre-1980 ozone levels, which is expected by 2065.

1842. The actions taken by Kazakhstan to eliminate halon in the fire fighting sector was therefore relevant to further protection of the ozone layer. On this basis the relevance was assessed as satisfactory.

[280] Handbook for the Vienna Convention for the Protection of the Ozone Layer - 7th Edition (2006). Article 2: General Obligations.

8.6.9.2.3 Efficiency

1843. The costs of the project excluding agency fees were $151,140 to eliminate the consumption of 101 ODP-t of halon per year, which results in a cost-effectiveness of $1.50 / ODP-kg per year. In the project, however, only about 20% of this target was achieved. The phase out was therefore equivalent to $7.48 ODP-kg per year, which was well above the threshold of acceptance for a project in the halon sector of $1.48 / ODP-kg per year. Most halon projects funded by the MLF have cost-effectiveness values of less than $1.48/ ODP-kg per year, while some are as expensive as $4.68/ ODP-kg per year[281].

1844. Therefore, this halon project in Kazakhstan at $7.48 / ODP-kg per year was assessed as an inefficient project in the halon sector by global standards.

8.6.9.3 Assessment of sustainability of project outcomes

8.6.9.3.1 Financial resources

1845. The outcomes of the project are very much dependent on continued financial support, which was evident by the lack of data on installed halon after 2006 when the project funding ceased, no further training or awareness raising since that time, and no replacement and training of new staff to replace those that left the Polygon recovery and reclamation centre which is no longer used.

1846. There has been no further work on the Halon Management Plan. A Halon Management Plan was not developed by the FESD as their mandate covers past incidences rather than preventative actions. In this regard, the NOU said that a Plan was developed, in cooperation with the MNREP but this was not provided to the evaluation team.

1847. The FESD is not financed by the central budget of the Department of State Enterprise. Instead, the FESD is required to contract its services by, for example, undertaking research for companies in the FESD's Research laboratory or extracting contamination from soil. The NOU advised that a legislative decree is required to authorise the further involvement of FESD after the project in halon work, that such a decree would take at least a year to come into force, and that one has not been drafted and launched. There is a general 'emergency' decree that could authorise the fire service to become involved in halon, which would expedite the flow of finance for this purpose, but this was considered very unlikely.

1848. The FESD was in the process of developing a small scale destruction facility to test the potential to destroy about 2t of halon 1301. Although FESD was not aware of the value of halon on the international market, they were aware of the administrative requirements that had to be completed when halon was shipped to purchasers, which they said acted as a disincentive to collection, storage and shipment. Nevertheless, the price of halon 2402 in the Russian market had increased from $5.50 per kg in 2000 to $18-25 per kg in 2006. Some of the increases in value were due to currency fluctuations. Assuming the price in 2009 was about $50 per kg, the value of 85t of halon 2402 in Kazakhstan would be about $4.2m[282].

1849. Rather than destroy the halon it would seem possible to use a portion of the funds from sales of halon on the international market to allow a team of personnel within FESD to continue to collect, recover and reclaim halon, and to encourage halon substitution. There is an international demand for halon in uses where alternatives have yet to be developed or implemented. The revenue from sale of halon have been used by other countries to support the development of an HMP, targeted awareness activities, further halon collection, the cost of training experts, and administrative costs associated with further halon shipments. Such revenue can be important to national organisations that depend to some extent on external/contractual funding to support their activities.

1850. The programme on halon recovery in Kazakhstan generally lacked leadership and direction. There was no evidence of a Halon Management Plan, and there was no specific campaign directed at companies to recover halon, and there was no financial strategy to continue the programme after the project was completed. For the reasons described above, the halon

---

[281] Final report on the evaluation of the halon sector. UNEP/OzL.Pro/ExCom/40/8

[282] TEAP - HTOC. 2006. *In*: Halon 2402 Supply and Demand. Page 26.

project was not assessed as sustainable.

8.6.9.3.2 Socio-political

1851. There was a division of activity between the FESD that worked on the recovery and reclamation of installed halon, that those within MNREP that were responsible for the development and implementation of the Halon Management Plan. There was little evidence of cooperation and engagement between the two organisations, and no acknowledgement of the roles and responsibilities that each played in this programme. As a result, the socio-political environment resulted in the project not being sustainable after the funding for the programme ceased.

8.6.9.3.3 Institutional framework and governance

1852. The institutional framework and governance is very important for halon projects, in order to motivate stakeholders to decommission installed halon and to replace them with alternatives, where possible. The countries that have had the most impact have been those that have listed in the legislation the categories of halon use that are considered critical i.e., an alternative has yet to be delivered, and required the decommissioning within a limited time period of halon not on a the list that is *ipso facto* non-critical and where replacements are known. Some countries have required the installer of the alternative to recover the halon and to take it to the recycling centre, and for this the installer is paid a premium in recognition of the extra work in recovering and transporting the halon. Last but not least, emissions of halon must be banned with dissuasive penalties for any emissions that take place. Together these elements form the backbone of a Halon Management Plan. The Plan needs to take account of logistical factors and the time required for halon decommissioning. When all the elements are in place, the Halon Management Plan can motivate owners of halon and alternative suppliers to decommission it and to install alternatives, and to recycle and reclaim halon for critical uses.

1853. A Steering Committee was required to be established in this project to undertake a number of functions related to guidance, evaluation and monitoring. There was no evidence that the Committee was established and that it undertook the assigned tasks. Further, more detailed comments on this Committee are made in paragraph 1872.

1854. FESD reported that legislation in Kazakhstan was not in place that required halon to be recovered, which made the process of collection more difficult. In addition, there was no law making emissions of ODS including halon illegal. Legislation on these aspects would normally be drafted by the CCCC and submitted to the MNREP for further assessment and processing. None of these activities have taken place. Finance from the central budget was available only under emergency situations, or if there was a specific decree that required their services. Both criteria did not apply to halon. For these reasons, the institutional framework and governance of this project was assessed as weak and which discouraged the prospects for sustainability of the reduction in the use of halon.

8.6.9.3.4 Environmental

1855. The annual amount recovered of about was about 21.25 tonnes per year which was about 80% less than that annual amount targeted at the beginning of the programme. There is a strong possibility that installed halon has been released by owners or installers of alternatives, particularly as there is no legal requirement to contain halon or a penalty for emitting it, and collecting and transporting it requires more effort and cost.

1856. The Polygon centre was abandoned, with cylinders of halon outside on the ground and some stacked up behind a wire mesh (Figure 28). Most of the cylinders were already empty, and it is possible that the halon had already been emitted. There was no report of procedures used to ensure that the stored halon was leak-proof, which was one of the intentions of the project.

1857. However, the comments above remain unsubstantiated, as there was no evidence to suggest that halon was emitted in either of these situations described above, and therefore it would be difficult to determine if there has been environmental damage due to halon emissions.

8.6.9.4 Catalytic role

1858. There was no potential for catalytic or replication effect as a result of this project, as the FESD and the Polygon Centre were the only government-operated facilities that were operating to recover halon. In other countries, there are now many private companies that recover, recycle and ship halon but this was not evident in Kazakhstan.

8.6.9.5 Achievement of outputs and activities

1859. The project achieved some outputs as a result of the funding, but many opportunities for other outputs were missed. Each of these areas is described below.

8.6.9.5.1 Delivered outputs

1860. The project developed local skills in designing and undertaking a survey Kazakhstan for assessing the quantity of halon installed in various sectors and specific locations. As a result of the survey and the responses of recipients, a database was constructed which described more accurately the quantity of halon installed in diverse locations, and the uses of the halon. This was a useful foundation step important to any Halon Management Plan implementation.

1861. In theory, this information allowed Kazakhstan to estimate the quantity of halon that was without an alternative and that should be categorised as "critical", and the remainder non-critical as alternatives were assessed as available. In practice, it appears that the information from the survey was not used to categorise halon into "critical" and "non-critical" uses. There was no requirement in the project for Kazakhstan to analyse the data by sector and use (critical and non-critical), which is a missed opportunity for building local skills that would be needed to develop a strategy to reduce and eliminate halon.

Figure 28: Cylinders of halon at the Polygon Research Centre, Kazakhstan.

1862. The project developed procedures and methods for collecting halon and storing it in a halon bank. This would have involved the technicians at the halon centre and their skills in safely removing halon from the cylinders and storing it in the larger tanks. In practice, there was no evidence that the skills for testing the quality of the halon were developed, only the collect and store skills, and there was no evidence that reclaimed halon was re-installed into applications that were considered critical.

Figure 29: Little-used halon recovery and reclamation equipment. Polygon Research Centre, Kazakhstan

1863. In a meeting with FESD representatives in November 2005 that addressed complaints by Kazakhstan of insufficient storage cylinders, the UNDP representative pointed out that the project should include resale of collected halon, and the objective was not to collect and store halon indefinitely. The evaluation team understood that FESD was undertaking trials to determine the most effective way of destroying about 2 tonnes of halon that had been collected. The continued storage with returning halon for critical uses, and the tests under development for destruction, both were evidence that skills and

procedures for the re-installation of halon were not developed. It was also apparent that FESD had not developed marketing skills to advertise and sell the halon for critical uses, which could have been undertaken for the local and international markets since the value of halon had increased considerably over the duration of the project.

8.6.9.5.2 Awareness about ODS, ODS substitute technology, and strengthening of institutional capacities for dealing with ODS phase-out

1864. Stakeholders' knowledge of the need to recover halon and to replace it with alternatives was improved through awareness raising activities. This took place in training workshops that focused on the identification and selection of alternatives to halon that targeted fire protection officials, fire engineers and safety managers. Other training sessions on halon decommissioning, and educational material on halon management and recycling, could also have increased awareness but there was no evidence in the UNDP final assessments that these objectives had been completed (but see paragraph 1866 below which suggested there was more than one workshop).

1865. Professor Djumagaliev Ruslan published a book entitled "*Reduction of the use of halon in Kazakhstan*", which improved knowledge of halon in Kazakhstan. The evaluation team reviewed this book which was mostly about existing knowledge on the environmental damage caused by halon and alternatives to replace it, taken largely from TEAP and other reports. The book contained very little specific information on the use of halon in Kazakhstan, and therefore it was not particularly useful for directing specific actions that would improve the installation of alternatives locally. Professor Djumagaliev Ruslan said that an article had been published a technical journal and that Kazakhstan had participated in an International Conference on halon in Minsk.

1866. The NOU reported that it took responsibility for raising the awareness on the need for activities to reduce the use of halon. On ODS in general, the held seminars and interviews with the mass media that informed the public about the hazardous nature of ODS. The book by Professor Djumagaliev Ruslan was released to focus specifically on the hazardous nature of halon, and he said that its release was followed by the workshops (plural).

1867. Awareness of halon recovery and replacement with alternatives could have been increased by the development and distribution of a brochure, but there was no indication in the final reports of such a brochure. Similarly, there was no evidence provided to the evaluation team of information published in fire protection journals, which would have also raised the awareness of halon recovery and its replacement with alternatives.

1868. The institutional capacity was not sufficiently strengthened during the project to put in place legislation that required non-critical uses of halon to be decommissioned and replaced with alternatives, and to have a list of critical uses as part of the legislation. Although critical uses were identified in the Project Document at the outset, there was no mechanism in the project to identify halon uses that were critical, to improve local knowledge of them and the actions that should be taken for non-critical halon.

1869. The MNREP did not gain knowledge and experience in the reduction of halon through the implementation of a Halon Management Plan, as this was never developed. As described above, there was limited communication between the MNREP and the FSED which resulted in a lack of strategic direction from MNREP that would have coordinated and guided many of the activities of the FSED. Kazakhstan therefore missed out an opportunity to learn how to reduce and sell halon through the development and implementation of a robust Halon Management Plan, as such a strategic development would have improved its environmental performance in regard to halon.

8.6.9.5.3 Authority / credibility, necessary to influence policy and decision-makers

1870. FSED was supplied with funding to undertake a survey, collect data on halon and to store the data in a database. FSED was also responsible for establishing halon quality testing procedures, and halon recovery and recycling procedures. FSED was responsible for developing and delivering training in to stakeholders on three different topics, and for developing informational materials to improve the awareness of halon and its alternatives. The MNREP was responsible

for the development and implementation of the Halon Management Plan, in coordination with the NOU and FSED.

1871. Therefore, the main stakeholders were the FSED, the MNREP and the NOU. It was important for these three bodies to communicate with each other and to influence policy and decision-makers on issues related to the reduction of the use of halon in Kazakhstan. As no legislation was developed that banned emissions of halon and that required their collection and storage, it was assessed that the main stakeholders did not have sufficient ability to influence the key policy and decision makers.

8.6.9.6 Assessment of monitoring and evaluation systems

8.6.9.6.1 Monitoring and evaluation design

1872. According to the Project Document, a Steering Committee was responsible for monitoring the implementation of the project, including:

- Establishing the policies and operating guidelines for the operation of the project;
- Examining the need to strengthen any existing fire codes / standards;
- Examining the need to strengthen any controls of new imported halon;
- Monitoring the performance of the FSED;
- Planning a marketing campaign for halon; and
- Following up on the training workshops and courses.

1873. The Steering Committee was to be established in the first 6 months of the project, and consist of representatives from MNREP, UNDP and Almaty Airport (or its operating agency). It was required to meet at least twice a year. The total time for the project was 36 months.

1874. In one part of the project document there was no provision for a representative of the NOU in the Steering Committee, which appears to be an oversight since the NOU is largely responsible for the reduction and phase out of ODS in Kazakhstan, and it would have been important to utilise the experiences of the NOU staff in this regard. However, in an earlier part of the Project Document, it states that the "…*Steering Committee will meet every 6 months with participation of the Ozone Focal Point and the representatives of the companies involved in the project … to discuss progress and to try to resolve any institutional, logistical or technical difficulties that may have arisen*". The NOU did not mention its involvement in any such Committee, and therefore we were unable to assess whether or not this Committee was established and become operational.

1875. There was no reporting requirement as a specific task in the Project Document, which appears to be an oversight as normally there is a requirement to report on the degree to which the activities and tasks have been achieved.

1876. The submission of a report is also not one of the responsibilities of the Steering Committee, as it is tasked only with the establishment, examination, monitoring, planning or follow up and not reporting. Omission of a requirement for the Steering Committee to submit a report on the results of these activities appears to be an oversight as normally there is a requirement to report on the degree to which the activities and tasks have been achieved.

1877. The FESD as the consultant for the project was not required in the sub-contract to submit a report on the results of the halon users' survey, database establishment and data entry, the establishment of the halon recovery and recycling centre, equipment certification, and preparation and dissemination of information on alternatives to halon. Omission of a requirement for the FESD/consultant to submit a report on the results of these activities appears to be an oversight as normally there is a requirement to report on the degree to which the activities and tasks have been achieved in a sub-contract.

1878. The M&E design was assessed as unprofessional and unsatisfactory because it assigned responsibility for monitoring but not for reporting on the results of the monitoring; it did not define the frequency of the reporting; and the inclusion of key stakeholders was ambiguous.

8.6.9.6.2 Monitoring and evaluation plan implementation

1879. The Steering Committee was not mentioned in the meeting with the NOU and FESD that was

attended by the evaluation team for the production of this report. Therefore, it was not possible to assess whether or not the Steering Committee had been established.

1880. Initially a letter was sent to UNOPS on 20 November 2005 in response to UNOPS request for a "*…status report indicating what was achieved and what was needed to complete the project*". The letter submitted by FESD was rejected by UNOPS who insisted on a report. In response, FESD submitted a 6-page document on the results of the project, which was received by UNDP on 13 February 2006.

1881. Half of the document submitted consisted of a 3-page summary of the issue of the depletion of the ozone layer, the chemicals involved in this depletion and actions taken by the international community as well as Kazakhstan. It continued with more project specific information on achievements that mentioned the:

- Establishment of a database on halon stockpiled (77,548 kg)
- Collection of 13,000 kg halon
- Receipt of equipment for halon recovery, recycling and storage
- A training workshop on alternative technologies
- Attendance of an ODS workshop to provide a status report
- Collection of properties and applications of Halons (these were generally available data)

1882. The report closes with a summary of the purpose of the project and the role of FESD in the project. A contract and a receipt for payment for publishing services were attached without mentioning what had been published.

1883. There was also no mention of activities required to close the project. The reported activities have been compared with Annex-II of the UNOPS/FESD contract. Task 1, 2 and 5 were assessed as completed, but according to UNDP on 11 November 2005, there was insufficient information on Tasks 3 and 4 to conclude completion.

1884. This report by UNDP reinforced the view that the activities in halon had focused on the quantities installed and some effort was put into recovering the halon for storage at the Polygon Centre. Many of the other activities such as the training, Halon Management Plan development and implementation and awareness raising were probably not completed at all or undertaken at a superficial level that was unlikely to have a sustainable impact on the reduction of the use of halon in Kazakhstan.

1885. The M&E implementation plan was assessed as unsatisfactory because there was no information submitted to the evaluation team that Described the Committee's:

- Policies and operating guidelines for the operation of the project;
- Assessment of the need to strengthen any existing fire codes / standards;
- Assessment of the need to strengthen any controls of new imported halon (although halon imports were banned);
- Evaluation of the performance of the FSED;
- Provision of a plan for marketing halon; and
- Opinion on the training workshops and courses as a result of its 'follow up'.

1886. Inadequate specification in the M&E design and implementation by UNDP in the formulation of the project, which failed to specifically direct effort toward M&E reporting and reporting frequency, was assessed as one of the key factors that caused difficulties for Kazakhstan in the M&E of this project.

8.6.9.6.3 Budgeting and Funding for monitoring and evaluation activities

1887. There was no budget allocated for M&E activities in the Project Document. There was no indication of how the Steering Committee would finance its meetings twice a year.

8.6.9.6.4 Long-term monitoring

1888. The only long-term monitoring that was anticipated in this project is the government's reporting of the consumption of ODS, including halon, which is required to be submitted annual to the

Ozone Secretariat based on the requirements of Article 7 in the Montreal Protocol. For halon this is expected to be zero, since Kazakhstan does not import, export or produce halon. Any deviation from zero would indicate that the project has failed.

1889. The "Article 7" reports in the context of this project are a relatively "blunt instrument" for measuring progress on the reduction and phase out of halon as they only focus on the import, export or production of halon, and not reduction in use which is a key parameter. In order to monitor the reduction in use, it is essential that owners of halon are surveyed on an annual basis and the database updated as a result of their response.

1890. The FESD informed the evaluation team that all monitoring ceased from 2006 as there was no funding from the government for such activity. The lack of monitoring results in the data becoming out of date, which in turn weakens the ability of the government to put in place sound policies and measures that promote the reduction and phase out of halon as for optimum impact they depend on the most recent data and information.

1891. A plan for the sale of halon, which was one of the responsibilities of the Steering Committee, would have resulted in proceeds from the sales if this plan had been developed and implemented. These proceeds could have been used for funding various activities in the project including ongoing monitoring of installed halon.

8.6.9.7 Assessment of processes that affected attainment of project results

8.6.9.7.1 Preparation and readiness

1892. The Project Document contained a number of shortfalls which were assessed as reducing the prospects of Kazakhstan to perform well in this project, such as:

- Critical uses were mentioned but there was no inclusion of activities and budget toward defining 'critical uses' and moreover, how to use them within a Halon Management Plan;
- Monitoring and evaluation design and implementation were inadequately addressed;
- Key stakeholders were omitted

1893. There was a lack of supervision and support (see below) which resulted in a focus by Kazakhstan on only the collection of halon and not on a range of other activities that collectively would have reduced the use of halon. These other activities were described in the previous sections in this project assessment.

1894. Establishing a recovery and reclamation programme for halon, halon banking and the implementation of a Halon Management Plan are activities that have been undertaken in many countries. There was no information provided to the evaluation team that suggested Kazakhstan had examined the similar work in other countries in order to incorporate the lessons learned into this project.

8.6.9.7.2 Country commitment and motivation

1895. Legislation that banned the import of halon was introduced in July 2003 (Decree 681) which was after the beginning of the project. It would have been preferable to have eliminated all options for import of halon before the start of this project in order to encourage companies to focus solely on halon-free methods for fire prevention, whereas without the ban there would have been an option to import. This indicated that Kazakhstan was not well prepared for this project, as otherwise this legislation would have been introduced before the start of the project.

8.6.9.7.3 Stakeholder involvement

1896. The main stakeholders were the MNREP, the FSED, the Airport Authority, the users of halon, the companies that sold and installed alternatives to halon, the certification body, the customs authority and the NOU.

1897. The stakeholders were correctly selected, but the communication between them appeared insufficient. For example, there was little communication and coordination between the MNREP that was responsible for legislation and the Halon Management Plan, and the FESD that was responsible for many of the "*on the ground*" activities. This resulted in activities that were focused only on one area e.g. halon collection and storage, rather than a range of activities that

were included in the project.

1898. The MNREP did not report on its analysis of the quantities of halon used in different sectors, as these data were collected by FESD and entered into the database. The MNREP did not produce a list of critical and non-critical uses as a result of its analysis of the data, as such a categorisation would have allowed the MNREP as a member of the Steering Committee to discuss how to decommission halon in an efficient and effective manner. The lack of communication between the MNREP and the FESD resulted in the project lacking strategic direction, and many of the tasks within the project remaining partially or wholly incomplete.

1899. The main mechanisms for engaging the stakeholders were the Steering Committee, the training courses (three different types) and the awareness programmes. The Steering Committee did not involve all the stakeholders and therefore there was no opportunity for those not included to express their view on activities in the project. There was on report that suggested the training on alternatives was completed which engaged companies that were involved in the supply of alternatives, but the outcome of the other training courses with fire service personnel could not be determined. The awareness programmes were reported to be on ODS in general, and therefore the stakeholders specifically involved in halon may not have been present at those meetings.

1900. In the light of these comments, the stakeholder involvement was assessed as unsatisfactory.

8.6.9.7.4 Financial planning

1901. The UNDP report of 11 November 2005 reported that $8,978 remained unspent from the budget, suggesting that expenditure at the finish of the programme was about 95% of the total budget. This was assessed as satisfactory as the project expenditure was within the budget allocated.

1902. The reporting in the project was virtually non-existent, so it is difficult to know exactly how the expenditure was apportioned toward specific items. About 59% ($81,400) of the budget was allocated for equipment, and 41% ($56,000) was allocated to international experts, and the subcontract to FESD for the survey and halon database and other activities.

1903. Expenditure for equipment could be determined as correct, since there was a report by UNDP that indicated the arrival of the equipment, testing and certification. The financial planning for some of the equipment was particularly poor. For example, the portable crane or hydraulic forklift was listed as being the responsibility of the sub-contractor to provide, whereas in the subcontract it was shown as "*second-hand mechanical or hydraulic forklift*" for $6000 in a different typeface, suggesting it had been added later. When the team visit the Polygon Centre there was no evidence of the forklift or crane suggesting it might have remained with the contractor, not been purchased or it had been stolen. Whatever the cause, the lack of fork lift prevents easy removal of the large cylinders from the truck on arrival at the Polygon Centre, which is an impediment to the sustainability of the project.

1904. However, the remainder of the funds was directed mainly at halon collection, to the detriment of the other activities in the programme such as training, publications, quality testing and the development of the Halon Management Plan.

1905. No funds were allocated to M&E or reporting by any of the organisations (including the FESD sub-contract) which resulted in a paucity of information on the results of all of the activities in this project. For this reason, the financial planning was assessed as unsatisfactory.

8.6.9.7.5 UNDP supervision and support

1906. Supervision and support are important elements that contribute to the success of a project, and are particularly important when problems arise and timely solutions are required to keep a project on track.

1907. More than three years after the Certificate of Completion (COC, October 2002), UNOPS in February 2006 requested from Kazakhstan a "*…status report indicating what was achieved and what was needed to complete the project*". This strongly indicated that there had been very little if any supervision and support by UNDP or its representatives during this project. Any supervision and support provided by UNDP to this project was certainly not timely as the request for the final report occurred many years after the COC. The quality of the initial Project

Document is questionable as it fails to include a requirement for reporting on the results of the M&E, key stakeholders are omitted, and there was no practical path or budget for some of the outcomes needed in the project e.g. critical uses.

1908. For the reasons described above, UNDP's supervision and support in this project were assessed as unsatisfactory.

8.6.9.7.6 Co-financing and project outcomes & sustainability

1909. There was no co-financing in this project. If the Steering Committee has carried out one of its tasks which was to develop a marketing plan for the halon, it would have increased the project's prospects of sustainability because the proceeds from the sale of halon could have been used to fund ongoing activities to reduce and eliminate the use of halon in Kazakhstan.

8.6.9.7.7 Project implementation delays and impact on project outcomes & sustainability

1910. There were delays in the implementation of many tasks which required a further 3-6 months for completion after October 2002, such as: Helium for the gas chromatograph, initiation of a database that quantified installed halon, accreditation of the gas chromatograph, registration of key documents with the hydro meteorological centre, design and distribution of the brochure on halon, information published in journals, and some other tasks.

1911. The delay in the completion of these tasks was assessed as not a major factor in themselves that would have affected the sustainability of the project. Rather, the individual tasks were not drawn together into a coherent Halon Management Plan, as this would have been the key document that would have promoted sustainability. The MNREP was responsible for the Halon Management Plan, and this activity was not undertaken.

8.6.9.8 Sub-Project Rating

KAZ/00/G36 – National halon management scheme programme (UNDP/UNOS)		
Criterion	**Evaluator's Summary Comments**	**Evaluator's Rating**
Attainment of project objectives and results Sub criteria (in yellow below)	See comments below	U
Effectiveness	Some but not all the deliverables were delivered, while some remain undetermined; halon recovered was 20% of installed; database was initiated very late; no Halon Management Programme	U
Relevance	Conversion to non-ODS technology is consistent with minimising the detrimental effect of ODS on the ozone layer	S
Efficiency	Inefficient as the cost per amount of halon recovered exceeded the cost-effectiveness threshold in the MLF and the cost-effectiveness of most halon recovery and recycling programmes globally	U
Sustainability of Project outcomes (overall rating). Sub criteria (in yellow below)	See comments below	U
Financial	No firm commitment to ongoing finance as this needed a legislative decree or a plan to finance from sales of halon, none of which were put in place to promote ongoing	U

KAZ/00/G36 – National halon management scheme programme (UNDP/UNOS)		
Criterion	**Evaluator's Summary Comments**	**Evaluator's Rating**
	activity on halon	
Socio-Political	Poor communication between MNREP (Policy) and FESD (implementation) precluded sustainability	U
Institutional framework and governance	No Halon Management Programme, legislation on halon imports late, no evidence of the establishment of the Steering Committee and no reports from the Committee of the tasks that were assigned.	U
Environmental	About 20% of the halon that was intended to be recovered was recovered; no reports of the implementation of alternatives	U
Achievement of outputs and activities		U
Monitoring and Evaluation (overall rating). Sub criteria (in yellow below)	See below	
M&E Design	Deficiencies in the M&E design made it difficult for Kazakhstan to perform well in this project as key tasks were missing, and there was no reporting requirement and delivery date for report	U
M&E Plan Implementation (use for adaptive management)	Kazakhstan partially implemented the M&E plan, but the number of tasks completed were few as the focus was on halon recovery	U
Budgeting and Funding for M&E activities	No budget allocated	U
Catalytic Role	No categorisation required	
Preparation and readiness	Insufficiently prepared as halon was late and MNREP/FESD were not well-coordinated	U
Country commitment and motivation*	Kazakhstan was not fully committed to this programme as the Halon Management Programme was not developed and implemented, and legislation was late	U
Stakeholders' involvement	Some key stakeholders were not represented in the Steering Committee which would have reduced ownership of the programme. Poor formulation and review of the Project Document resulted in ambiguity of stakeholder involvement	U
Financial planning	Within budget, but lack of Steering Committee plan for sales of halon, and MNREP Halon Management Programme,	U

KAZ/00/G36 – National halon management scheme programme (UNDP/UNOS)		
Criterion	**Evaluator's Summary Comments**	**Evaluator's Rating**
	were the main causes of the lack of sustainability	
UNEP supervision and support**	UNDP/UNOPs support was virtually non-existent, and any enquiries on progress were late	U
Overall Rating		U

Highly Satisfactory (HS); Satisfactory (S); Moderately Satisfactory (MS); Moderately Unsatisfactory (MU); Unsatisfactory (U); Highly Unsatisfactory (HU);
*Motivation replaced TOR 'driveness'; **Support replaced TOR 'backshopping'

Blank page for double-sided printing

7 Latvia

8.7.1 Background

1912. As in many of the countries that became independent of the former Soviet Union[283], many of them in the early to mid-1990's had steadily reduced imports of ODS, in anticipation of the imminent closure of CFC and halon 2402 production in the Russian Federation. They wanted to eliminate their dependency on predominantly Russian imports by putting in place procedures that would avoid disruption to the national users of equipment, when the supply in Russia ceased.

1913. As a developed country Latvia was required to, *inter alia*, phase out the consumption of halon on 1 January 1994; and to phase out CFCs, methyl chloroform and carbon tetrachloride on 1 January 1996. Consumption of CFCs by Latvia was reduced from 4,737 ODP-tonnes in 1989 to 665 ODP-tonnes in 1995[284], during a period of severe economic turmoil. Despite this significant effort, Latvia was in non-compliance with the Protocol because 307[2] ODP-tonnes of Annex A substances were reported as consumed in 1996. Latvia continued to report CFC consumption in each year from 1996 to 2000 inclusive. In 1995, the foam sector accounted for about 2% of the ODS consumption, refrigeration 29% and aerosols 63%.

1914. Latvia met three times with the Protocol's Implementation Committee to discuss its compliance status with the requirements of the Montreal Protocol. In 1996, Latvia notified the Committee that it would be in non-compliance with the Montreal Protocol, and that despite efforts it was making to eliminate ODS using its own finances, the state of non-compliance was likely to continue into the future[3]. Latvia was urged by the Parties to ratify the London Amendment, and funding agencies were recommended to consider providing financial assistance. At the second meeting in 1997, the Committee noted that Latvia had not yet ratified the London Amendment. The Committee recommended that international assistance should be provided, particularly from the GEF, to assist Latvia to realise the ODS reduction and phase out objectives established in its country programme[3].

1915. At the third meeting in 1998, the Committee noted that Latvia had made significant progress in reducing the consumption of CFCs[285]. This had been achieved by applying a tax on CFC imports, in agreement with the industry. Latvia had also made progress in determining the quantity of installed halon, with the intention that decommissioned halon could be stockpiled for critical uses. The Committee noted that ODS was being used in aerosol applications, for which there were cheaper alternatives available, and that ODS phase out projects were being initiated rather late. In Decision X/24, the Parties noted Latvia's commitments:

- To observe the ban on the production and import of Annex A, Group II, substances imposed on 12 December 1997;
- To limit consumption of Annex A, Group I, substances to no more than 100 metric tonnes in 1999; and
- To ban the production and import of Annex A, Group I, and all Annex B substances by 1 January 2000;
- The Committee noted that Latvia would need to apply strictly apply its import quota

[283] Latvia became independent from the Soviet Union in 1990.
[284] Ozone Secretariat Data Centre, updated 13 May 2009.
[285] Decision X/24 (1998): Compliance with the Montreal Protocol by Latvia. See also earlier Decisions VIII/22 (1996) and IX/29 (1997) as a result of discussions with representatives from Latvia in the Implementation Committee.

restrictions already in place to meet these commitments.

1916. In 1996, Latvia had acceded only to the Vienna Convention and the Montreal Protocol. It was not until 1998 that Latvia accepted the London and Copenhagen Amendments. Since that time, Latvia has accepted the Montreal Amendment in 2002 and the Beijing Amendment in 2004.

8.7.2 Generalised objectives, output and performance indicators

1917. The design of the UNEP and UNDP projects for Latvia did not require clearly defined logframe analysis and prior agreed performance indicators (PIs) at the time of their formulation and approval. The 2004 Mid-Term Review undertaken for the UNEP-managed projects identified the issue of the absence of results-based management and accountability framework, including the lack of PIs in the UNEP sub-projects.

1918. In the absence of these PIs, project outputs and outcomes and PIs based were developed for this Terminal Evaluation Assessment, based on the results of the mid-term evaluation, the UNEP PIRs and achievements that became evident during the assessment of each of the sub-projects. Table 45 summarises these generalised objectives, outputs and outcomes that were used as a guide in the assessment of each of the sub-projects in the Latvia country report[286].

Table 45: Generalised objectives, outputs and outcomes that were used as a guide in the assessment of each sub-project

Objectives/Intended Results	Outputs/Deliverables	Outcomes/Performance indicators
1. Strengthening of the national capacity to effectively coordinate and administer the actions outlined in the Country Programme and the Refrigerant Management Plan	1. Establishing the National Ozone Unit and initiating actions that created a suitable climate in the country for the expeditious phase-out of ozone-depleting substances (ODS) 2. Political priority assigned by the Government to environmental issues and to the objectives of the Montreal Protocol in particular	1. Strengthened institutional capacity and improved coordination among stakeholders: • Time required for UNEP to disburse the first funding tranche • Timely recruitment of sufficient and qualified National Ozone Unit staff • Timely establishment of adequate infrastructure • Provision of the counterpart funding • Continuity of National Ozone Unit staff and operation • Ratification of Montreal Protocol Amendments • Establishment of the Interagency Committee • Approval of the Action Plan • Access of National Ozone Unit staff to decision makers
2. Legislative measures that promote the phase-out of ODS	3. Development, promotion and adoption of legislative acts and regulations on control of ODS	2. Introduction of legal acts regulating ODS import related issues and their enforcement: • Adoption of legislation on ODS import/export licensing system • Establishment of ODS import quota system • Register of authorized importers • Introduction of ban on trade of ODS and equipment containing ODS • Adoption of qualification requirements for servicing

[286] As each Country Report is a self-contained chapter with its own Annex, for completeness (but at the expense of repetition) the same Table showing these generalised objectives, outputs and outcomes was provided in each Country Report.

Objectives/Intended Results	Outputs/Deliverables	Outcomes/Performance indicators
		activities • Adoption of legislation that mandates ODS recovery, reclamation and recycling • Measures on enforcement of legislation through training of customs officers • Change of market price between CFCs and substitutes
3. Increased coordination and monitoring of the Country Programme and the Refrigerant Management Plan	4. Effective interaction with governmental institutions and agencies 5. Increased cooperation with business sector and professional associations 6. Assistance in the coordination and monitoring of the implementation of investment and training sub-projects executed by Implementing Agencies as part of the Refrigerant Management Plan	3. Improved coordination and monitoring in implementation of the Country Programme and the Refrigerant Management Plan: • Evidence of access of National Ozone Unit to, and interaction with, decision makers • Involvement of private sector stakeholders • Establishment and support of the Refrigeration Association • Successful completion of training of custom officers together with UNEP • Successful completion of training of good servicing practices • Successful completion of training of ODS recovery, reclamation and recycling operators • Successful completion of conversion of to non-ODS technology
4. The design and implementation of ODS awareness programme	7. Conducting awareness workshops for central and regional governmental officials, environmental inspectors and customs officers on Montreal Protocol objectives 8. TV and radio interviews on ozone layer protection issues 9. Dissemination of booklets about ozone layer protection, and implementation of National ODS Phase out Programme	4. Improved communication with, and effective engagement of governmental and non-governmental institutions, professional organizations, private sector and general public, in ODS phase out activities 5. Reduction of ODS consumption due to public awareness programme • Number of workshops and degree of participation of institutions listed in (4) above • Number of publications prepared and disseminated • Degree of market penetration of ODS-free products and methodologies
5. Support and encourage local industry and technical institutes to adopt ODS-free substitute technologies	10. Support in conversion of manufactured equipment to non-ODS technology 11. Coordination in the provision of modern tools and equipment to servicing workshops in the domestic, commercial refrigeration and air-conditioning sectors	6. Adoption ODS-free substitute technologies 7. Adoption of good servicing practices and availability of modern tools in the refrigeration sector, including recovery and recycling • ODP-tonnes phased out • Number of servicing sets provided to servicing enterprises
6. The collection of required data on ODS use and consumption,	12. Collection, analysis and exchange of Montreal Protocol-related	8. Establishment the line of communication with the Customs authority and licensed importers

Objectives/Intended Results	Outputs/Deliverables	Outcomes/Performance indicators
establish the lines of communication in the country and reporting to the Ozone Secretariat and Implementing Agencies	information in the country and the region 13. Preparation of annual reports on ODS consumption and National Ozone Unit activities to the Ozone Secretariat 14. Preparation and submission of necessary information and reports to the Implementing Agencies 15. Exchange of experience between the National Ozone Unit and other Network members to combat illegal trade in ODS, including sub-regional cooperation	as a means of collecting ODS import data 9. Establishment the line of communication with National Ozone Units in border countries: • Creation of ODS database • Availability of Montreal Protocol-related information on the Ozone-Secretariat website • Reports of the Implementation Committee • Participation in Central Asia and Eastern Europe Networking • Assessments of the quality of the National Ozone Unit reports by Implementing Agencies
7. Country reduction and phase out of the consumption of controlled ODS by the agreed date	16. Coordination of the implementation of the National ODS Phase out Programme	10. Compliance with ODS phase out schedule established by the Parties in a specific Decision, as a result of the considerations of the Protocol's Implementation Committee

8.7.3 Sub-Project finance

1919. The GEF Project was approved on 9 July 1997 and completed in December 2007. A new start date of July 2003 was later agreed, and several extensions when additional time was necessary to finalise sub-project implementation associated with institutional strengthening.

1920. The GEF funded four sub-projects in Latvia:

- GF/2110-99-16 Institutional Strengthening for the Implementation of the Montreal Protocol in Latvia (UNEP);
- LAT/97/G34 National programme for recovery and recycling of ODS refrigerants (UNDP/UNOPS);
- LAT/97/G31 Sectoral phase-out of CFCs in aerosol industry (UNDP/UNOPS); and
- LAT/97/G33 Phase out of the use of CFCs in the manufacture of rigid polyurethane foam at Ritols (UNDP/UNOPS).

1921. The GEF grant was $1,439,691 for equipment, services, technical assistance, training, physical and price contingencies and net present value of incremental operating costs, allocated as shown in Table 46.

Table 46: Summary of budget and expenditure in Latvia Programme

Project	GEF–budget* (US$)	Total Expenditure* (US$)
UNEP / Institutional Technical Assistance	168,000	168,000**
LAT/97/G34 Recovery/ Recycling	130,103	123,205
LAT/97/G31 Sectoral Phase-out of CFCs in Aerosol Industry	954,400	849,527
LAT/97/G33 Ritols	106,000	93,379
UNEP/ CP / Project Formulation ***	24,740	24,740
TOTAL	1,383,243	1,258,851

* This amount includes UNOPS Executing Agency Support Cost and Project Support Services given by UNDP country office; **No final figure reported; *** Latvia/Lithuania (50% of UNEP budget/expenditure)

8.7.4 GF/2110-99-16 Institutional Strengthening for the Implementation of the Montreal Protocol in Latvia (UNEP)

8.7.4.1 Introduction

1922. The general objectives of the sub-project were to raise awareness of ozone depletion and to promote the use of ODS substitute technology; to strengthen the institutional infrastructure to deliver the ODS phase-out; and to enable Latvia to be compliant with the Montreal Protocol phase-out schedule for developed countries. The successful implementation of this sub-project also became important for Latvia's compliance with the ODS phase out requirements of the EU, which were more stringent than the Montreal Protocol, in preparation for Latvia's accession to the EU in 2004.

1923. The Project was approved by the GEF on 1 July 1997 and by UNEP in October 1999. The intended completion date was September 2002. A new start date was agreed for 2003, and the completion date as a result was repeatedly extended to finally conclude on 31 December 2007.

8.7.4.2 Attainment of objectives and planned results

8.7.4.2.1 Effectiveness

1924. The aims of the sub-project were to build and strengthen Latvia's institutional capacity to eliminate ODS through the effective implementation of its Country Programme and Refrigerant Management Plan. The Plan required Latvia to accurately monitor and report on the reductions and elimination of ODS, in order to comply with the requirements of the Montreal Protocol.

1925. The specific objectives on "*Institutional Strengthening for the Implementation of the Montreal Protocol in Latvia*" were to:

- Establishment and effective functioning of the NOU;
- Legislative measures drafted and implemented that controlled ODS;
- Annual reports on the consumption and use of ODS based on data collected under the aegis of this project are produced;
- ODS-free technologies adopted and ODS phased out;
- ODS awareness programmes designed and implemented; and
- NOU Action Plan to phase out ODS designed, implemented and progress monitored.

1926. With strengthened institutional capacity, Latvia would effectively carry out awareness raising activities with national stakeholders on the environmental damage caused by ozone-depleting substances, and how this could be avoided with the use of substitutes to replace ozone-depleting substances. In regard to training, policy instruments would be established to facilitate the implementation of codes of good practice and a certification scheme for refrigeration and air-conditioning technicians. Custom officials would be advised on how to control imports and exports of ozone-depleting substances and ODS-dependent equipment. A training infrastructure would be established for the ongoing training after the sub-project had been completed.

1927. An assessment of the degree of achievement of these performance indicators by Latvia is provided in Section 8.7.4.5.1 "*Delivered outputs*" below.

8.7.4.2.2 Relevance

1928. The reduction and phase out of ODS in Latvia is consistent with the objectives of the Vienna Convention and the Montreal Protocol, which *requires Parties to take appropriate measures in accordance with the provisions of this Convention and of those Protocols in force to which they are party to protect human health and the environment against adverse effects resulting or likely to result from human activities which modify or are likely to modify the ozone layer*[287].

1929. The GEF established in 1995 an Ozone Layer Depletion Focal Area in response to the Montreal Protocol. The Focal Area has the strategic objective of protecting human health and the environment by assisting countries to phase out their consumption and production of ODS, to prevent emissions of ODS, and to encourage the uptake of alternative technologies and practices

[287] Handbook for the Vienna Convention for the Protection of the Ozone Layer - 7th Edition (2006). Article 2: General Obligations.

according to a country's commitments under the Montreal Protocol. The financial interventions in the GEF Focal Area contribute to the return of the ozone layer to pre-1980 ozone levels, which is expected by 2065.

1930. Most recently, the dual capability of ODS to both reduce ozone and to have a detrimental impact on the climate have been described[288]. Global ODS consumption in 1989 was equivalent to about 9,200 million tonnes (9 Gt) CO_2-eq/year, which was reduced to about 1,870 million tonnes (1.8 Gt) CO_2-eq/year in 2007 as a result of ODS phase-out activities under the Montreal Protocol. This reduction of about 7 Gt CO_2-eq/year was at least three times greater than the Kyoto Protocol's reduction target (about 1-2 Gt CO_2-eq/year in 2008-2012), demonstrating that the global ODS reductions achieved so far have already yielded a larger climate benefit than the current Kyoto Protocol target.

1931. The reduction and phase out of ODS prior to Latvia's accession to the EU was relevant for avoiding non-compliance with EU legislation on ODS that applied shortly after accession in May 2004.

1932. The actions taken by Latvia to phase out ODS is therefore relevant to further protection of the ozone layer (Montreal Protocol), accession to the EU, and relevant to reducing the impact of radiative forcing of the climate (Kyoto Protocol).

8.7.4.2.3 Efficiency

1933. The cost-effectiveness as a means of determining 'efficiency' was not relevant as this was an Institutional Strengthening project which is not normally subject to cost-effectiveness criteria. However, the project (including the sub-project-projects) was reported to leverage $659,000 of co-finance from the government of Latvia, which indicated that the government's environmental objectives were well-aligned with the objectives in this sub-project. The amount of co-finance for the Institutional Strengthening sub-project was not ascertainable.

1934. However, efficiency can also be measured in terms of the size of the team in relation to its tasks and achievements. During the Project the NOU was had a staff of 1.5 FTE[289]. They were assisted by contracted and voluntary assistance from local experts, according to the budget and sub-project. The NOU used Institutional Strengthening funding to obtain short-term expertise not found in government for ozone protection activities that were being carried out by the Ministry of Environment, rather than funding government personnel. This helped to conserve project funds, as payment of government salaries from the Institutional Strengthening funds would have quickly reduced the project's funds due to the strong value of the local currency.

1935. Today, the NOU is 0.25 FTE as the one person remaining allocated most time to non-ODS issues. As in other Ministries and departments, the MoE has had to reduce staff in response to the economic crisis[290]. However, the NOU has put in place legislation that empowered other services (such as Customs officers and the State Environment Service inspectors) to undertake independent work on ODS. The results of their work were reported to the NOU which, in effect, precluded the need for a large NOU.

8.7.4.3 Assessment of sustainability of project outcomes

8.7.4.3.1 Financial resources

1936. Latvia's Institutional Strengthening sub-project was effectively started in 2003 and it was completed in December 2007. The GEF allocated a budget of $168,000. Latvia was reported to provide $51,000 as in-kind co-finance. The total budget was therefore $219,000.

1937. The Project was originally prepared by an International Project Coordinator (IPC) in the Latvian Environment, Geology and Meteorology Agency (LEGMA). The Ministry of Environment (MoE) subsequently established a National Ozone Unit (NOU) in September 2004[291]. Since that time, the MoE has been the competent authority responsible for ozone layer protection in Latvia and

---

[288] Velders, J.M., Andersen, S.O., Daniel, J.S., Fahey, D.W. and M. McFarland. 2007. The Importance of the Montreal Protocol in protecting climate. http://www.pnas.org/content/104/12/4814.abstract

[289] Full-Time-Equivalent.

[290] Financial Times 12 May 2009 "Latvian economy slides by 18%". In general, Latvia's financial performance in 2009 is likely to be the worst among the 27 Member States, as GDP reduced by 18% in 2009 (compared to a 10% increase in 2008).

[291] Decree 233 of 1 April 2004: Ozone Layer Protection Regulations

the NOU has been paid from the central budget of the MoE.

1938. On 1 May 2004, Latvia acceded to the European Union which resulted in continued access to funds to progress Latvia's political and economic transition in areas that included transport, local development, energy, environment and finance. The NOU also obtained funds from the European Commission for attending meetings on the phase out of ODS, such as the one held in Mexico on alternatives to methyl bromide.

1939. Latvia also has had access to the EU's Cohesion Fund which is a structural instrument that helps Member States to reduce economic and social disparities and to stabilise their economies since 1994. The Cohesion Fund finances up to 85% of eligible expenditure of major projects involving the environment and transport infrastructure. This strengthens cohesion and solidarity within the EU. The least prosperous Member States whose gross national product (GNP) per capita is below 90% of the EU-average are eligible, which includes Latvia. For the Cohesion Funds €15.9 billion (in 2004 prices) were available for the years 2004-2006, with more than half of the funding (EUR 8.49 billion) reserved for activities in Member States that most recently joined the EU.

1940. The risk of withdrawal of financial support from the MoE, for the 0.25 FTE needed to support ongoing activities in the NOU that are related to ozone layer protection, was assessed as low. The activities related to ozone layer protection are financed by several ministries according to legislative requirements, and they have been integrated into the business of some organisations that can make a profit (from training personnel, for example). The risk of withdrawal of financial support amongst these ministries and organisations was also assessed as low. Overall, the finance for ozone layer protection was assessed as sufficient to support ongoing activities in this field.

8.7.4.3.2 Socio-political

1941. Several organisations assisted the MoE to implement activities on ozone layer protection including LEGMA (Statistics on quantity of ODS used and purposes); the State Plant Protection Service (SPPS, methyl bromide use and emissions); the State Revenue Service – Customs Department (import and export of ODS to non-EU countries); the State Environmental Service (SES, Inspectorate that visits companies to determine the use and emissions of ODS); the State Fire-Fighting and Rescue Service (halon and alternatives); the Civil Aviation Administration (halon); and the Marine Administration (halon and alternatives). The Latvian Refrigeration Engineers Association (LREA) is an NGO that assisted with technical training on refrigerant management.

1942. Latvia has put in place the structure that it believed was able to be responsive to the work on ozone layer protection. The range of organisations involved was assessed as sufficient to promote ongoing activities in this area because these organisations were staffed by personnel that had built up experience in activities related to the reduction and phase out of ODS, including training in best-practice management, alternatives that are not ozone depleting, and monitoring & reporting on consumption.

1943. The time to put this structure in place took longer than expected, and the project was delayed by about 4 years as a result. The MoE commented that additional time was needed to establish the appropriate institutional arrangements to implement an effective and efficient Project to phase out of ODS. The MoE cited the formation of the SES from a number of bodies in 2005 as a good example of the structure that was needed to efficiently deliver on the objectives of the Project.

1944. Since that time, the government has continued to implement a multi-stakeholder approach that involves different services, administrations and ministries to undertake activities on monitoring and reporting ODS use. The requirements of the stakeholders are supported by legislation. In this way, the NOU itself can remain relative small with a strategic role, knowing that other stakeholders are involved in ozone layer protection.

8.7.4.3.3 Institutional framework and governance

1945. As described in paragraph 1941 above, the institutional framework and governance for ozone layer protection in Latvia has been divided up between many organisations with responsibilities assigned to each organisation. The coordination of these activities heavily depends on the NOU

that has 0.25 FTE allocated to this task, as the remaining time is allocated to activities on F-gases and other issues.

1946. Because the activities of one person have been '*spread thinly across a range of activities*', and that ozone is only 0.25% of their time, there is a risk that the ozone activities will not be carried out to the standard required or that some activities will be omitted altogether. To some extent failure to undertake and complete some activities has already become apparent because, for example, the results of the ODS recovery and destruction programme were not made available to the evaluation team, and the NOU has yet to carry out an assessment of the reports by other departments and organisations on the results of their work on ODS.

8.7.4.3.4 Environmental

1947. There were no environmental risks that were assessed as potentially undermining this work in the future since most ODS has been phased out and environmental legislation is in place to promote ongoing activities. However, in a broader context and since joining the EU in 2004, Latvia has developed and implemented a single legislative instrument that enforces the requirement for specific activities on ODS and F-gases to further protect the environment.

1948. As this results in less duplication of effort and cost, compared to the implementation of separate activities to comply with separate instruments on ODS and F-gases, this was assessed as likely to promote a suitable environment for the ongoing activities on ODS. One instrument for both ODS and F-gases is also consistent with the current discussion by Parties in the Montreal Protocol that are seeking to determine the extent to which F-gases can be considered under this treaty.

8.7.4.4 Catalytic role

1949. The key factors influencing catalytic action are *innovation, demonstration, replication* and *cooperation*. In this Institutional Strengthening sub-project, the single factor that influenced catalytic action was *cooperation*. The NOU initiated a diverse range of activities on ozone layer protection with other departments, ministries and organisations. Later the requirement for these activities to continue was ensured by legislation. Therefore, this Institutional Strengthening sub-project was assessed as having a catalytic role to some extent.

8.7.4.5 Achievement of outputs and activities

8.7.4.5.1 Delivered outputs

1950. Although there were no performance indicators noted in the Project Document, the planned outputs and deliverables according to the Mid-Term[292] report were:

- Establishment and effective functioning of the NOU;
- Legislative measures drafted and implemented that controlled ODS;
- Annual reports on the consumption and use of ODS based on data collected under the aegis of this project are produced;
- ODS-free technologies adopted and ODS phased out;
- ODS awareness programmes designed and implemented;
- NOU Action Plan to phase out ODS designed, implemented and progress monitored.

8.7.4.5.1.1 Establishment and effective functioning of the NOU

1951. After the Country Programme for Latvia was approved by the GEF in July 1998, Latvia intended to establish an NOU to implement the Programme to phase out ODS. In 1999 Latvia proposed the establishment of an NOU but this was rejected in April 2000 because the government needed more time to decide the most appropriate location for the NOU in the context of a major reorganisation of the government infrastructure. In 2003 Latvia considered locating the NOU within the Latvian Environment Agency, but eventually in November 2004 it was established in the MoE.

[292] Buxton, G.V. and R. Ciconkov. 2004. A Mid-Term Evaluation of UNEP's GEF-Sponsored Capacity Development and Institutional Strengthening Projects in Countries with Economies in Transition. Report prepared for UNEP-EO. 174pp. Page 102.

1952. Effective functioning of the NOU dependent on activities on ozone layer protection carried out by several other bodies. The MoE is responsible for the development and implementation of ODS policies, legislation, regulation and any other control measures. They are also responsible for waste management. The MoE developed the Export / Import control regulations but in close consultations with Customs officials / Ministry of Finance.

1953. In 2004, the MoE has several subsidiary bodies including eight Regional Environmental Boards, State Environmental Inspectorate and the Latvian Environmental Agency:

- The 8 Regional Boards are responsible for permitting of business operations, environmental assessment air emissions management and other activities. One Regional Board (Lielriga) issued the ODS export / import licence to an individual that had a valid annual permit.
- The State Environmental Inspectorate conducted surveillance and enforcement actions in relation to individual users of ODS. Every individual user must report consumption and use. If the Customs officials indicate that there has been illegal trade then it is the SEI who is authorized to impose penalties. The MoE reported that SES inspectors made 487 checks in 2008 (compared with 10 in 1998) and issued 44 infringement notices to companies involved in ODS.
- The Latvian Environmental Agency was established in 2002 and is responsible for data collation, preparing responses for all reporting requirements for MEAs including the Montreal Protocol. The MoE reviews the results and transmits them to the relevant MEA.

1954. The Ministry of Finance also has a role. It is the Ministry that houses the Customs Department because of its larger role in tax collection. The Customs Board also has an "Inspectorate" which is responsible for inspection and enforcement at the border.

1955. After 2004, the State Environment Service took over the functions of the 8 regional boards (for the administrative districts) and different sectors (ships, waste etc) that were present when the Project was being formulated. The government structure today in Latvia is therefore more streamlined than during the term of the sub-project.

1956. To assist the NOU with the implementation of this sub-project, in 2004 Latvia recruited and ODS officer and assistants, an accountant, resource persons for awareness seminars, a consultant for legislation evaluation and development, a consultant for qualification of technicians involved in servicing, and a consultant to carry out a survey on ODS used as a refrigerant. A further consultant was engaged to revise and prepare the regulations on ODS, including the methyl bromide legislation.

8.7.4.5.1.2 Legislative measures drafted and implemented that controlled ODS

1957. Relevant legislation implemented in Latvia *before the project commenced* in 2004 included an ODS licensing system; a tax on imports of ODS in 1997; import quotas for CFCs, HCFCs and CTC; provisions for qualifications and certification of personnel that work with refrigerants; provisions to recovery and recycle ODS; a ban on halon imports effective 1 January 1997; and a voluntary freeze by importers and users on ODS consumption. Subsequently, Latvia banned CFC imports on 1 January 2001. A 2002 Latvian regulation on ODS that was implemented to harmonise as much as possible Latvian legislation on ODS with Regulation (EC) No 2037/2000 before Latvia joined the EU on 1 May 2004.

1958. However, A new regulation[293] on ODS and fluorinated gases came into force on 1 January 2006 to fully implement the requirements of EU legislation, which replaced all previous versions on ODS legislation.

1959. As an EU Member State, the European Commission requires Latvia to submit annual reports on emissions control of ODS (minimum qualification requirements), the use of MB and alternatives, critical uses of halons, the use of CFCs in medical products that control asthma, the phase out of halon on ships and in aircraft, and the quantity of ODS recovered, reclaimed, recycled and destroyed.

[293] Decree 688 "Regulations on Ozone Layer Depleting Substances and Fluoride Greenhouse Effect Gases, which are Refrigerating Mediums", adopted 6 September 2005.

1960. Latvia therefore put in place the structure that it believed was able to be responsive to the work on ozone layer protection. The time to put this structure in place took longer than expected, and the project was delayed by about 4 years as a result. The MoE commented that additional time was needed to establish the appropriate institutional arrangements to implement an effective and efficient Project to phase out of ODS. The MoE cited the formation of the SES from a number of bodies in 2002 as a good example of the structure that was needed to efficiently deliver on the objectives of the Project.

1961. The development and implementation of legislation took place *before* the NOU was established and *before* the Institutional Strengthening sub-project commenced. The evaluation team concluded that the NOU had little or no role in this process and that the Institutional Strengthening programme was started too late to have assisted in the development and implementation of the ODS legislation.

8.7.4.5.1.3 Annual reports on the consumption of ODS

1962. As stated above, the Latvian Environmental Agency is responsible for data collation and for preparing responses for all reporting requirements for Multilateral Environmental Agreements (MEAs). The MoE reviews the results and transmits them to the relevant MEA, including the Montreal Protocol.

1963. Latvia submitted reports to the Montreal Protocol, as required under Article 7 on data reporting, each year from 1995 to 2003. There is no record of Latvia submitting a report from 1 January to 30 April 2004. From 1 May onwards when Latvia became a member of the EU the European Commission was responsible on behalf of the EC for submitting reports annually to the Montreal Protocol. The Institutional Strengthening programme may have assisted the Latvia to comply with the ODS legislative requirements of the EU prior to accession on 1 May 2004.

1964. The results of the recovery and recycling of ODS were not submitted to the evaluation team, which would have been useful to see progress on the phase out of ODS. The MoE agreed to supply the data from 2004 to 2008, since data prior to 2004 were not considered reliable.

8.7.4.5.1.4 ODS-free technologies adopted and ODS phased out

1965. Latvia's objective was to phase out consumption of 223 ODP-tonnes per year, mainly by implementing ODS-free technologies in the aerosol and foam sectors.

1966. However, the two largest aerosol projects went bankrupt prior to the start of the Project, which eliminated the need to phase out 201 ODP-tonnes. Only one aerosol company (5 ODP-tonnes) and one spray foam company (12.5 ODP-tonnes) remained, and the CFCs were phased out in these companies in the project. The phase out of ODS in these projects is discussed in detail in Sections 8.7.6 (aerosols) and 8.7.7 (foam).

1967. Moreover, the consumption of CFCs had already been reduced in one year by more than 90%[294] from 1996 to 1997, possibly as a result of the strict enforcement by Latvia of the legislation that banned the import of CFCs. Therefore, more than 90% of the CFCs were phased out prior to the start of the project, and 90% of the remaining ODS was phased out by two companies that went bankrupt.

1968. The aerosol company bankruptcies also assisted Latvia to comply with Decision X/24 of the Parties to the Montreal Protocol. The consumption of Annex A was reduced by to 21.6 ODP-tonnes, which was well within Latvia's commitment given in Decision X/24 of 100 tonnes. Latvia reported zero ODS consumption for CFCs in 2001.

1969. The evaluation team concluded that the Institutional Strengthening sub-project was unlikely to have contributed significantly to the adoption of ODS-free technologies and to the total phase out of ODS in Latvia. This assessment concurred with the comments made by the mid-term assessors that stated "*…most of the original objectives as set out in the original project documents or subsequent amendments have already been achieved and with virtually no assistance provided via this project. It therefore unrealistic to evaluate the efficacy of this [Institutional Strengthening] project in this context*".

[294] Consumption of CFCs was 307 ODP-tonnes/1996; 23.0/1997; 25.3/1998; 21.6/1999; 35.2/2000; and 0/2001.

8.7.4.5.1.5 ODS awareness programmes designed and implemented

1970. The NOU undertook an extensive campaign of Awareness Raising over a 12 month period, beginning in December 2005, to educate Latvian school children on the value of protecting the ozone layer called "*Protect and be Protected*". The NOU worked with 5 experts/teachers across different disciplines. These initiatives included: 37 press releases; Information on ODS regulations provided to NGOs, state authorities and private companies; Publishing and regularly updating a webpage; Development of portable experiments; Video on ozone layer protection; Launch of campaign "Ozone Layer Friendly School" with competitions; Production of 1,500 "3mm"[295] posters and 600 maps; Development of teaching aids for multi-level education; Two publications; Five regional training workshops for teachers of primary school as well as teachers of chemistry, biology, geography and physics; Manufacture of special souvenirs, prizes and certificates (sponsored as much as possible); Production of a Latvian version of the Ozzy Ozone video; and a Closing Ceremony with 142 Ozone Layer Friendly Schools.

1971. The NOU surveyed the knowledge of pupils after the campaign and found they correctly answered most of the basic questions and more than half of the difficult ones on ozone layer protection. The information developed in the Awareness Raising campaign is now used by schools that want to be accredited as a Green School.

1972. It is possible that ozone layer protection will continue to be in the public mind in Latvia for some time in the future, as a result of the Awareness Raising campaign that involved more than 100 schools. Knowledge on ozone layer depletion and alternatives is one of the criteria for a school being accredited as a Green School. Embedding the programme in the curriculum of Green Schools will foster ozone layer protection in future generations of school children. Their knowledge gained as children may also alter their behaviour as adults by discouraging exposure to high levels of UV radiation that is damaging to human health.

1973. A website was designed and uploaded with information on the activities being undertaken on ozone layer protection in Latvia.

1974. As in many other countries, Latvia undertook extensive activities on Awareness Raising to shore up support from the public, government and business stakeholders for legislation and activities that would restrict and eventually phase out ODS. As in other countries, a baseline and performance indicators to measure the benefits of ODS reduction were never developed. These could have been, for example, before and after data on the number of ODS-free refrigerators bought by the general public, an increase in ODS refrigerators being sent for recycling, demand for information on the website (as number of hits) on ODS-free alternatives. It was therefore impossible to evaluate the impact of the awareness programme.

8.7.4.5.1.6 NOU Action Plan to phase out ODS designed, implemented and progress monitored

1975. The NOU developed and implemented an Action Plan for reducing and eliminating ODS that involved mainly the MoE, the eight Regional Environmental Boards, the State Environmental Inspectorate, the Latvian Environmental Agency, the Ministry of Finance (and Customs), the Latvian Refrigeration Association, and the two companies that required financial and technical assistance to eliminate ODS.

1976. The results of the implementation of the Action Plan are discussed in separate projects: Sections 8.7.5 (ODS recovery and recycling; and training in best-practice ODS servicing); Section 8.7.6 (aerosol enterprise), and Section 8.7.7 (foam enterprise).

8.7.4.5.2 Awareness about ODS, ODS substitute technology, and strengthening of institutional capacities for dealing with ODS phase-out

1977. The extensive work in Latvia to increase the awareness of school children of ozone layer depletion was provided in Section 8.7.4.5.1.5 above. The work on ODS substitute technology was focused on two enterprises and described in Section 8.7.6 (aerosol enterprise) and Section 8.7.7 (foam enterprise).

1978. The strengthening of institutional capacities for dealing with ODS phase-out occurred mainly in the MoE, the State Environmental Inspectorate, the Latvian Environmental Agency, the Ministry

[295] The thickness of the ozone layer

of Finance (and Customs), and the Latvian Refrigeration Association. The roles of the Ministry of Finance (and Customs), and the Latvian Refrigeration Association, are discussed further below.

8.7.4.5.3 Authority / credibility, necessary to influence policy and decision-makers

1979. The NOU in Latvia has the authority / credibility, necessary to influence policy and decision-makers, which has been shown mainly through the NOUs ability to:

- Establish an effective recovery and recycling programme in collaboration with enterprises that recovers and recycles ODS;
- Coordinate the training of technicians and Customs officers;
- Undertake awareness raising programmes by attracting the interest of the local media and by organising meetings with key stakeholders.

1980. This credibility has been established by an NOU team that employed local and international consultants for performing some of the key tasks.

8.7.4.6 Assessment of monitoring and evaluation systems

8.7.4.6.1 Monitoring and evaluation design

1981. The GEF specified that project monitoring would be performed by UNEP/UNDP and the cost for this activity would be included in the budget. A standard evaluation would be performed, except in the case that an in-depth evaluation was required by the GEF. In that case, independent consultants would be hired and sent to Latvia. Consultancy fees and travel costs would need to be obtained in addition to the amounts requested in the project.

8.7.4.6.2 Monitoring and evaluation plan implementation

1982. UNEP's 'Risk Factor Table'[296] was evaluated as evidence of the implementation of the evaluation plan.

1983. UNEP scored Latvia as low risk for the Management Structure (*stable with role and responsibilities clearly understood, clear stable management structure with open communication and collaboration across public and private sector*); Work flow and implementation (*the project is maintaining its planned work flow, and the NOU appears to be on schedule since the development of the new Work Plan*); Budget and fund management (*Progressing according to budget, funds are wisely spent and correctly and transparently accounted for and errors by UNEP corrected*); Reporting (*progress reported comprehensively and very much on time. Reports contain critical analysis*); Communication and leadership (*the NOU has access to government officials from across a range of ministries and the coordinator as Head of Division of the Technology Unit, Department of Environment Protection Ministry of Environment, as good access to other high-level persons in the government*); Sustainability (*EC conformity ensures sustainability*); Sources of information (*follows TEAP recommendations*); and Political support (*full political support*). The external risks were also assessed by UNEP as low risk – *political stability, the economy is improving, and the environmental conditions were safe and predictable.*

1984. UNEP scored Latvia as medium risk for Stakeholder Involvement because no information was available on the stakeholder network, and for Local Capacity because Latvia was having difficulty finding local expertise in recycling /reclamation technologies.

8.7.4.6.3 Budgeting and Funding for monitoring and evaluation activities

1985. The evaluation team focused on the outcomes of the projects rather than the detail of the financial expenditure. There was no information available on the budgeting and funding of the monitoring and evaluation activities.

8.7.4.6.4 Long-term monitoring

1986. Article 7 "Reporting of data" mandates Parties to the Montreal Protocol to report by 30 September each year on their consumption and production of ODS in the previous year. Decision XV/15 in 2003 encouraged Parties to forward data on consumption and production to the Secretariat as soon as the figures became available, and preferably by 30 June each year,

[296] Dated 8 August 2005

rather than 30 September in order to facilitate the work of the Protocol's Implementation Committee. The Secretariat reported in 2009 that most Parties are able to comply with the June requirement.

1987. Data reporting on consumption is the most important action on long-term monitoring and a '*litmus test'* of progress in the phase out of ODS and the sustainability of the phase out. The Implementation Committee has not remarked on any aspects of data reporting by Latvia, which suggest that reporting has been timely and accurate. Data reporting, and the infrastructure necessary for this, is expected to continue to be included in the annual budget by the government of Latvia for work assigned to the NOU.

8.7.4.7 Assessment of processes that affected attainment of project results

8.7.4.7.1 Preparation and readiness

1988. The Project was approved by the GEF on 1 July 1997 and by UNEP in October 1999. The intended completion date was September 2002. A new start date was agreed for 2003, but this was delayed to November 2004 because the NOU was not established and functioning. Latvia first proposed the establishment of an NOU in 1999 but this was rejected in April 2000 because the government needed more time to decide the most appropriate location for the NOU in the context of a major reorganisation of the government infrastructure. In 2003 Latvia considered locating the NOU within the Latvian Environment Agency, but eventually in mid-2004 it was established in the MoE. Without the NOU, the project objectives and timeline for achieving them were not practical as the project management arrangements (financial, logistical) were not in place.

1989. The evaluation team assessed Latvia as unprepared and unready for this sub-project on Institutional Strengthening.

8.7.4.7.2 Country commitment and motivation

1990. The major reorganisation of the government infrastructure at the time the project was initiated, which resulted in constantly delaying the establishment of the NOU, made it difficult for Latvia to demonstrate that as a country it was committed and motivated to this project.

1991. Once the NOU was established, Latvia showed that it was committed and motivated by establishing, as examples, an effective ODS recovery and recycling programme; by coordinating the training of technicians and Customs officers; and by undertaking awareness raising programmes which attracted the interest of the local media; and by organising meetings with key stakeholders.

1992. Perhaps the single largest factor that committed and motivated Latvia to ozone layer protection was the requirement to harmonise legislation on ODS with the EU, and to become compliant with EU phase out requirements for ODS which were more strict than the Montreal Protocol, prior to acceding to the EU on 1 May 2004.

1993. Once Latvia became an EU Member State, the European Commission required Member States including Latvia to submit annual reports on emissions control of ODS (minimum qualification requirements), the use of MB and alternatives, critical uses of halons, the use of CFCs in medical products that control asthma, the phase out of halon on ships and in aircraft, and the quantity of ODS recovered, reclaimed, recycled and destroyed.

1994. Latvia therefore put in place the structure that it believed was able to be responsive to the EU requirements on ozone layer protection. The time to put this structure in place took longer than expected, and the project was delayed by about 4 years as a result. The MoE commented that additional time was needed to establish the appropriate institutional arrangements to implement an effective and efficient Project to phase out of ODS. The MoE cited the formation of the SES from a number of bodies in 2002 as a good example of the structure that was needed to efficiently deliver on the objectives of the Project.

8.7.4.7.3 Stakeholder involvement

1995. The MoE / NOU was responsible for the development and implementation of ODS policies, legislation, regulation and other control measures; the NOU involved a range of stakeholders, including the State Environmental Inspectorate, the Latvian Environmental Agency, the Finance

Ministry (and hence Customs), and the Latvian Refrigeration Engineers Association. The roles of each body were described in paragraph 1953 above. In addition, the NOU involved administrative staff, teachers for awareness raising, schools, national and international consultants, and NGOs involved in environmental protection.

1996. The partnerships formed as a result of the involvement of these stakeholders was assessed as creating effective stakeholder participation to progress the work of the NOU and the MoE in ozone layer protection.

8.7.4.7.4 Financial planning

1997. UNEP reported errors in expenditure reporting by Latvia and UNEP initially, and by UNEP when the project was first re-activated in 2003. This was due to an initial disbursement to Latvia by UNEP in 1999 in anticipation of the start of the Project, but there was no subsequent report by Latvia on the use of these funds because neither the NOU nor the financial reporting structure had been established. The first report by Latvia sometime later showed that these funds had been partly used to finance the participation of the Latvian delegation in the Meeting of the Parties to the Montreal Protocol in China in 1999.

1998. After 2004, UNEP reported that financial reporting was satisfactory, once the NOU and the Project FMO and Task Manager had rectified inaccuracies in the financial reports.

8.7.4.7.5 UNEP supervision and support

1999. UNEP was the lead agency in the Country Programme preparation and in the implementation of Institutional Strengthening and Capacity Building, awareness raising and training activities. UNEP DTIE (Paris) was the responsible supervising organisation from the inception of the NOU in Estonia in 2000 until 2003. This period was the period of initiation and learning for the newly formed NOU. UNEP GEF (Nairobi) took over the supervisory role from 2004 onwards.

2000. UNEP made many attempts between 1999 and 2004 to establish a working relationship with Latvia on the Institutional Strengthening sub-project, and was on the verge of giving up on this Project. The Project was only possible once the NOU had been established in 2004. From that time onwards, the UNEP Task Manager worked with the NOU to revise the Work Plan. One of the outcomes was that the Progress Reports for June-December 2004 and Jan-June 2005 were received on time, with accompanying financial reporting. Prior to this time, the Progress Reports were not being submitted by Latvia to UNEP, and the financial reports sent to UNEP by Latvia were not satisfactory.

2001. The evaluation team assessed UNEP supervision and support as highly satisfactory.

8.7.4.7.6 Co-financing and project outcomes & sustainability

2002. The GEF allocated a budget of $168,000 to Latvia's Institutional Strengthening sub-project. Latvia was reported to have provided $51,000 as in-kind co-finance. The total budget was therefore $219,000.

2003. The co-finance by Latvia of 23% of the total cost of the Institutional Strengthening project is a substantial contribution. This significant level of co-finance demonstrated the commitment of Latvia to the sub-project and probably increased the Latvia's feeling of "ownership" of the programme. Increased ownership has been shown in other projects to promote sustainability, since the government commitment is greater than when there is no financial commitment.

2004. The significant level of co-finance by Latvia was also an acknowledgement to provide long term stability to the programme, since the results of the ODS monitoring were required to be submitted annually to the European Commission in accordance with Latvia's responsibilities as a Member State of the EU after May 2004.

2005. For these reasons, the evaluation team assessed Latvia's significant level of co-finance of the sub-project on Institutional Strengthening as a significant factor that helped to promote the sustainability of the programme.

8.7.4.7.7 Project implementation delays and impact on project outcomes & sustainability

2006. The project implementation delay of 4-5 years was assessed as not having a significant impact on the sustainability of the ODS phase out programme in Latvia. This was because Latvia had

already implemented important legislation on ODS prior to the NOU being established, and because harmonisation of Latvia's legislation on ODS was of paramount importance when acceding to the EU.

8.7.4.8 Sub-Project Rating

GF/2110-99-16 Institutional Strengthening for the Implementation of the Montreal Protocol in Latvia (UNEP)		
Criterion	**Evaluator's Summary Comments**	**Evaluator's Rating**
Attainment of project objectives and results Sub criteria (in yellow below)	See comments below	S
Effectiveness	Latvia's institutional capacity was strengthened which improved its ability to comply with EU legislation, rather than assisting Latvia to comply with the objectives of the IS	S
Relevance	Strengthened institutional capacity is consistent with the ability of a country to take action to minimise the detrimental effect of ODS on the ozone layer	HS
Efficiency	A relatively small team in the NOU leveraged national resources to coordinate a range of activities on ozone layer protection in a cost-effective and timely manner	S
Sustainability of Project outcomes (overall rating) Sub criteria (in yellow below)	See comments below	S
Financial	Co-finance level of 23% of the total project cost was significant; a final report on expenditure vs budget was not provided; EU funds after 2004 assisted with achieving environmental compliance	S
Socio-Political	Significant delays in establishing an NOU which delayed the implementation of a multi-stakeholder approach	S
Institutional framework and governance	Non-existent initially because of a major government re-organisation that took several years, but once in place it proved efficient and mostly effective	S
Environmental	EU environmental legislation after 2004 supports Latvian compliance and the sustainability of the phase out of ODS	S
Achievement of outputs and activities		S
Monitoring and Evaluation (overall rating)	See below	

GF/2110-99-16 Institutional Strengthening for the Implementation of the Montreal Protocol in Latvia (UNEP)		
Criterion	**Evaluator's Summary Comments**	**Evaluator's Rating**
Sub criteria (in yellow below)		
M&E Design	No evidence of an M&E design	MS
M&E Plan Implementation (use for adaptive management)	UNEP provided a risk analysis of key elements of the project which was helpful to Latvia	S
Budgeting and Funding for M&E activities	Not determinable from the documentation provided	MS
Catalytic Role	No categorisation required	
Preparation and readiness	Latvia was unprepared and unready for this sub-project on Institutional Strengthening	US
Country commitment and motivation*	Major restructuring by the government made it difficult initially for Latvia to show commitment and motivation; once the NOU was established, the project proceeded satisfactorily	S
Stakeholders' involvement	The project involved the relevant stakeholders and made use of the skills, experience and knowledge of key national and international organisations	S
Financial planning	Inadequate at first, but improved with coaching from UNEP and analysis of mistakes by both UNEP and Latvia	S
UNEP supervision and support**	UNEP supervision and support was highly satisfactory because of the additional time coaching Latvia on UNEP's requirements	HS
Overall Rating		S

Highly Satisfactory (HS); Satisfactory (S); Moderately Satisfactory (MS); Moderately Unsatisfactory (MU); Unsatisfactory (U); Highly Unsatisfactory (HU);
*Motivation replaced TOR '*driveness*'; **Support replaced TOR 'backshopping'

8.7.5 LAT/97/G34 National programme for recovery and recycling of ODS refrigerants (UNDP/UNOPS)

8.7.5.1 Introduction

2007. The "*National Programme for Recovery & Recycling of ODS Refrigerants*" aimed to establish a programme for the recovery and recycling of ODS used in refrigeration and air-conditioning equipment in order to avoid imports of CFCs. Latvia received equipment for recovering and recycling ODS in order to undertake the tasks in this sub-project. Normally, funding for the training of personnel was funded as a separate sub-project, but for Latvia the training aspect was funded as part of the Institutional Strengthening sub-project. For coherence with the recovery and recycling sub-project, the training programme is described in this Section.

2008. The sub-project intended to eliminate 9.72 ODP tonnes per year over the two year duration of the sub-project. UNDP signed the grant agreement on 18 March 1998. The equipment was distributed to servicing companies in 1999. The budget allocated by UNDP for the equipment

was $123,412. The project was completed in February 2000 when the Certificate of Completion and Handover Protocol were signed by UNDP.

8.7.5.2 Attainment of objectives and planned results

8.7.5.2.1 Effectiveness

2009. There were no specific achievement or performance indicators that were developed for this project. Effectiveness could be evaluated by assessing:

- The number of personnel trained in Latvia on the use of the ODS recovery and recycling equipment;
- The distribution of ODS recovery and recycling equipment to servicing centres in Latvia, and establish two Recovery and Reclamation Centres;
- The quantity of ODS recovered and recycled in Latvia, compared with the targeted amount per year.

2010. The achievement of outputs and activities by Latvia in this sub-project on recovery and recycling of ODS, as measured against these performance indicators, are provided in Section 8.7.5.5.1 "*Delivered outputs*" on page 400.

8.7.5.2.2 Relevance

2011. The ODS recovery and recycling programme, as well as the training programme in best practices, are programmes that are consistent with the objectives of the Vienna Convention and the Montreal Protocol, which *requires Parties to take appropriate measures in accordance with the provisions of this Convention and of those Protocols in force to which they are party to protect human health and the environment against adverse effects resulting or likely to result from human activities which modify or are likely to modify the ozone layer*[297]. The recovery of the ODS and its use for servicing avoided the need for the production of new CFCs, thereby reducing the global impact of CFCs on the ozone layer. The training programme in best-practice management of ODS reduced also emissions to the ozone layer.

2012. The GEF established in 1995 an Ozone Layer Depletion Focal Area in response to the Montreal Protocol. The Focal Area has the strategic objective of protecting human health and the environment by assisting countries to phase out their consumption and production of ODS, to prevent emissions of ODS, and to encourage the uptake of alternative technologies and practices according to a country's commitments under the Montreal Protocol. The financial interventions in the GEF Focal Area contribute to the return of the ozone layer to pre-1980 ozone levels, which is expected by 2065.

2013. Most recently, the dual capability of ODS to both reduce ozone and to have a detrimental impact on the climate have been described[298]. Global ODS consumption in 1989 was equivalent to about 9,200 million tonnes (9 Gt) CO_2-eq/year, which was reduced to about 1,870 million tonnes (1.8 Gt) CO_2-eq/year in 2007 as a result of ODS phase-out activities under the Montreal Protocol. This reduction of about 7 Gt CO_2-eq/year was at least three times greater than the Kyoto Protocol's reduction target (about 1-2 Gt CO_2-eq/year in 2008-2012), demonstrating that the global ODS reductions achieved so far have already yielded a larger climate benefit than the current Kyoto Protocol target.

2014. Actions taken by Latvia to reduce emissions of ODS through the implementation of a recovery and recycling programme and the training of technicians were also relevant to Latvia's accession to the EU in May 2004, as the EU legislated for such activities in Regulation (EC) No 2037/2000 on "*Substances that Deplete the Ozone Layer*".

2015. The actions taken by Latvia to recover and recycle ODS was therefore relevant to further protection of the ozone layer (Montreal Protocol), relevant to reducing the impact of radiative forcing of the climate (Kyoto Protocol), and relevant to Latvia's accession to the EU.

---

[297] Handbook for the Vienna Convention for the Protection of the Ozone Layer - 7th Edition (2006). Article 2: General Obligations.

[298] Velders, J.M., Andersen, S.O., Daniel, J.S., Fahey, D.W. and M. McFarland. 2007. The Importance of the Montreal Protocol in protecting climate. http://www.pnas.org/content/104/12/4814.abstract

8.7.5.2.3 Efficiency

2016. The cost-effectiveness of the sub-project was calculated in the Project Document to be $11.76 ODP-kg per year, assuming the elimination of 9.72 ODP-tonnes of ODS and a project cost of $123,412.

2017. This cost-effectiveness of $11.76 ODP-kg per year was similar to the average cost-effectiveness of $9.60 ODP-kg per year reported for refrigeration recovery and recycling projects carried out in 25 developing countries[299]. There was no co-finance for this project declared by Latvia.

2018. These theoretical calculations of cost-effectiveness could not be verified in practice because the quantity of ODS phased out as a result of the sub-project could not be obtained.

8.7.5.3 Assessment of sustainability of project outcomes

8.7.5.3.1 Financial resources

2019. The Certificate of Completion for this sub-project was not obtainable, and therefore it was not possible to review the expenditure against budget for the equipment. Revers noted that the equipment was more than 10 years old and suited to the recovery of CFCs. They expressed concern that it may not be suitable for further work on HCFCs. After the evaluation visit, the manufacturer of the RTI RRC750 regeneration unit confirmed that it could also be used to recover and reclaim HCFC-22[300]. Under new EU legislation, only recovered HCFCs can be used to refill equipment from 1 January 2010 until 31 December 2014 and therefore this machine could be used in the EU until that time.

2020. For the training component, the Latvian Refrigeration Engineers Association provided courses on best-practices in ODS and F-gas management and issued qualification certificates for technicians that passed the course. The trainee or their company paid for the cost of the training course.

2021. The self-financing of training that resulted in these training activities being held after the Institutional Strengthening sub-project was completed were assessed as highly satisfactory as they promoted the sustainability of the programme on the recovery and recycling of ODS after the sub-project was completed. However, the severe impact of the global economic crisis in Latvia[301] was assessed as likely to result in a deferment of training because the company or the trainee may not be able to afford to pay for the courses.

2022. Some of the equipment that was provided more than 10 years ago may also be useful for recovery and recycling HCFCs within the EU until the end of 2014. In 2009 it was too early for the industry to assess whether HCFC recovery would be financially viable, and the details of legislation coming into force on 1 January 2010 that would affect HCFC recovery and recycling, had not been agreed.

8.7.5.3.2 Socio-political

2023. The Latvian Refrigeration Engineers Association was the key body involved in the training programme, and the servicing companies were mainly involved in the ODS recovery and recycling programme. These bodies could act with a reasonable level of autonomy from and were not dependent on further input from the government. On this basis, the socio-political risk that could jeopardise further activities in these two areas was assessed as low.

8.7.5.3.3 Institutional framework and governance

2024. The institutional framework and governance in Latvia consisted of the MoE that was responsible for policy on ODS and for reporting ODS consumption to the Montreal Protocol; the State Environment Service that conducted surveillance on consumption and use of ODS and undertook enforcement action, including the authorisation of penalties for illegal use of ODS; and the Latvian Environmental Agency that was responsible for data collation, and for preparing responses for all reporting requirements to MEAs including the Montreal Protocol.

---

[299] MLF. 2000. Desk Study on Recovery and Recycling Projects. UNEP/OzL.Pro/ExCom/31/18. Data in Annex II analysed by Touchdown Consulting Brussels.

[300] RTI Technologies confirmed in April 2009 that the RRC750-SP1-UNDP equipment supplied in the Project would also reclaim HCFCs without any modifications, despite the label on the equipment mentioning only R12.

[301] Financial Times 12 May 2009 "Latvian economy slides by 18%". In general, Latvia's financial performance in 2009 is likely to be the worst among the 27 Member States, as GDP reduced by 18% in 2009 (compared to a 10% increase in 2008).

2025. The MoE had produced legislation in Latvia that prescribed qualification and certification requirements for personnel that worked with refrigerants, and a requirement to recovery and recycle ODS. A 2002 Latvian regulation on ODS that was implemented to harmonise as much as possible Latvian legislation on ODS with Regulation (EC) No 2037/2000 before Latvia joined the EU on 1 May 2004. A new Regulation[302] on ODS and fluorinated gases came into force in Latvia on 1 January 2006 to fully implement the requirements of EU legislation, which replaced all previous versions on ODS legislation. The MoE (and the NOU), the State Environmental Inspectorate and the Latvian Environmental Agency all had responsibilities for key aspects of the recovery and recycling of ODS under Latvian legislation.

2026. The institutional framework and governance in Latvia was assessed as satisfactory for promoting the ongoing activities related to the recovery and recycling of ODS, and the continuation of the training on best-practice management of ODS. However, there was insufficient transfer of information between these bodies in a timely way that promoted policy assessment. For example, the ODS recovery information was collected by the State Environment Service and later analysed by the Latvian Environment Agency, but the results of the analysis were not passed on in a timely manner to the NOU and the companies. The lack of information did not encourage the NOU and the companies to undertake further action on the recovery and recycling of ODS.

8.7.5.3.4 Environmental

2027. There are a number of legislative measures that became applicable in the EU from 1 January 2010 that, when implemented and enforced, will improve the protection of the ozone layer in Europe. Many of them are extensions of the requirements that were present in earlier ODS legislation that was operative from 1 October 1999 until 31 December 2009 and which was operative during the term of this ODS recovery and recycling sub-project.

2028. For example, to reduce the release of controlled substances into the atmosphere, provision should be made by Member States for the recovery of used controlled substances and the prevention of leakages of controlled substances[303]. The European Commission as the 'guardian' of the legislation is required to establish a list of products and equipment for which the recovery for destruction, or destruction without prior recovery of ODS, should be considered technically and economically feasible and therefore mandatory[304].

2029. Directive 2006/12/EC of the European Parliament and of the Council of 5 April 2006 on waste[305] and Council Directive 91/689/EEC of 12 December 1991 on hazardous waste[306] both have measures that require the environmentally sound disposal and recovery of waste, as well as controls on hazardous waste such as ODS. In this regard, Member States are required to pay special attention to ODS used in construction, to ODS remaining in demolition waste and to waste electrical and electronic equipment (WEEE)[307] that falls within the scope of Directive 2002/96/EC.

2030. ODS contained in refrigeration, air-conditioning and heat pump equipment, equipment containing solvents or fire protection systems and fire extinguishers are required to be recovered for destruction, recycling or reclamation, during the maintenance or servicing of equipment or before the dismantling or disposal of equipment[308]. ODS contained in products and equipment is required to be recovered for destruction, recycling or reclamation, or destroyed without prior recovery, if technically and economically feasible [309].

2031. Companies are required to take all precautionary measures practicable to prevent and minimise any leakages and emissions of controlled substances. Refrigeration, air conditioning or heat pump equipment, or fire protection systems, including their circuits, which contain more than 3, 30 or 300 kg or more of ODS, are required to be checked for leakage every 12, 6 or 3 months

---

302 Decree 688 "Regulations on Ozone Layer Depleting Substances and Fluoride Greenhouse Effect Gases, which are Refrigerating Mediums", adopted 6 September 2005.

303 Preamble number 20 in Regulation (EC) 1005/2009 on ODS

304 Preamble number 26 in Regulation (EC) 1005/2009 on ODS

305 OJ L 114, 27.4.2006, p. 9. Directive 2006/12/EC is repealed by Directive 2008/98/EC of the European Parliament and of the Council of19 November 2008 on waste and repealing certain Directives (OJ L 312, 22.11.2008, p. 3) with effect from 12 December 2010.

306 OJ L 377, 31.12.1991, p. 20.

307 OJ L 37, 13.2.2003, p. 24. (3)

308 Article 22(1) of Regulation (EC) No 1005/2009 on ODS

309 Article 22(4) of Regulation (EC) No 1005/2009 on ODS

respectively. Any detected leakage must be repaired as soon as possible and in any event within 14 days. The equipment or system shall be checked for leakage within 1month after a leak has been repaired to ensure that the repair has been effective[310].

2032. The strengthening of environmental legislation in the EU that mandates additional activities on ODS recovery and leakage checking and repair was assessed as adequate to ensure the ongoing activities of the recovery and recycling programme in Latvia after this sub-project was completed.

8.7.5.4 Catalytic role

2033. The Latvian Refrigeration Engineers Association reported that some companies that did not receive the equipment from the sub-project purchased their own, because they improved company profitability by avoiding the need to purchase CFCs and because the equipment was necessary for them to have their company certified for ODS recovery and recycling operations.

2034. The purchase of recovery and recycling equipment by companies outside the project replicated equipment provided to companies, and was assessed as a good example of catalytic action. This action by companies outside of the project was assessed as likely to improve the sustainability of the recovery and recycling programme, as the equipment was available to more companies that those in the sub-project. The Latvian Refrigeration Engineers Association was not able to provide information on the number of companies outside the sub-project that obtained equipment.

8.7.5.5 Achievement of outputs and activities

8.7.5.5.1 Delivered outputs

2035. There were no specific achievement or performance indicators for this project (Section 8.7.5.2.1). The performance indicators for this project could be evaluated by assessing:

- The number of personnel trained in Latvia on the use of the ODS recovery and recycling equipment;
- The distribution of ODS recovery and recycling equipment to servicing centres in Latvia, and establish two Recovery and Reclamation Centres;
- The quantity of ODS recovered and recycled in Latvia, compared with the targeted amount per year.

2036. The delivered outputs are discussed for each of the performance indicators.

8.7.5.5.1.1 Training in best-practice ODS management

2037. The Latvian Refrigeration Engineers Association was formed by 10 companies in 1998 in response to the sub-project that required training in best-practice ODS management. The Association is a non-profit making society. Currently, the membership consists of 105 companies. The mandate of the Association is to represent the views of the enterprises, to organise seminars and workshops, to produce guide books on best practice, to deliver training and certification services for refrigeration personnel, to process consumer claims for grievances against companies in their association, and to provide technical advice to the government on future legislation.

2038. Prior to the start of the sub-project, Latvian Refrigeration Engineers Association representatives visited Amu-Gruppen AB (Sweden) in 1998 to learn best practice in recovery and recycling operations, and how to establish a training and certification scheme. While in Sweden, 14 technicians and 2 trainers were trained.

2039. From 1999 to 2005, there were no records of training of personnel in Latvia. Since 2005, the Association has trained 3-5 trainees per month on refrigerant management[311]. The training syllabus covers ozone depletion and the greenhouse effect, the operating principles of refrigeration, properties of refrigerants, emission reduction, equipment (commercial, domestic,

[310] Article 23(1&2) of Regulation (EC) No 1005/2009 on ODS

[311] Names of technicians trained and certified from 2005 – 2007 (102); in 2008 (72); and in 2009 (6).

low temperature), and 8 Latvian decrees[312] affecting the use and management of ODS and F-gases. About 15h of the 40h course is spent on F-gases, and the remainder of the time is allocated to providing information on ODS.

2040. In total including the year 2009, about 180 technicians have been trained. The trainee or their company pays for the cost of the course. Not all trainees passed the course. Not all of them pass the courses. In March 2009, for example, all of them failed either the theory or the practice.

2041. Certification is valid for 3 years, and a blue licence issued by Latvian Refrigeration Engineers Association to each trainee is evidence of the qualification that is presented on request when they begin work at a new site. Certification can be extended by evidence of employment in refrigeration management in the past 2 years, possession and availability of equipment to recover recycle refrigerants, and a record of reports filed each year to SES on ODS and F-gases.

2042. The evaluation team concluded that the Latvian Refrigeration Engineers Association was essential for establishing the training and maintaining a useful course syllabus after the Project finished. About half the technicians were trained before the Institutional Strengthening sub-project finished in 2007 and the remainder afterwards. The Association offers the training as part of its core business, which is likely to expand because of recent legislative requirements that requires best management practices for fluorinated greenhouse gases used as refrigerants. The training was comprehensive and renewable, both features that helped with keeping existing technicians up-to-date with the latest technology.

8.7.5.5.1.2 Distribution of ODS recovery and recycling equipment

2043. In 1999 or 2000, equipment was distributed by the Latvian Refrigeration Engineers Association to companies in Latvia that were involved in the recovery and recycling of ODS. The Association distributed 40 recovery machines to companies, and 2 recovery and recycling machines and 2 reclamation units to 2 Reclamation Centres.

8.7.5.5.1.3 Quantity of ODS recycled and recovered

2044. The project in Latvia set a target of 9.72 ODP tonnes of ozone-depleting substances to be recovered per year over a two year period. Initial surveys were carried out to determine the size of the CFC stockpiles in Latvia. The State Environment Service was assigned responsibility for data collection. The Latvian Environment, Geology and Meteorology Agency was responsible for receiving the data from the Service, and storing it ready for analysis by the NOU.

8.7.5.5.1.3.1 Surveys of stockpiles

2045. The NOU, assisted by the Latvian Refrigeration Engineers Association, carried out a survey to determine the amount of ODS that had been recovered, recycled and destroyed. The NOU reported that the companies were reticent to supply such information on recycled ODS. As a result the survey form was modified and sent to servicing companies that were equipped with ODS recovery and recycling equipment.

2046. In November 2004, almost 5 years after the sub-project was completed, the NOU undertook a survey which established that 60 servicing companies existed in Latvia. The NOU also surveyed the best-practice knowledge of ODS technicians and reported that they were '*…largely knowledgeable of safe practices*'. A workshop was organised to decide how to collect and destroy the stocks, but the key participants did not attend the workshop. The NOU decided to postpone the stock collection until after the ODS project had been completed.

8.7.5.5.1.3.2 State Environment Service

2047. The infrastructure for collecting and analysing information on ozone-depleting substances recovery had been established in Latvia. The State Environment Service advised the evaluation team that service companies and owners of equipment that used more than 100 kg of refrigerants and 'non-refrigerants' were required to submit a Form[313] annually that supplied

[312] Decree 158 on hazardous substances; Decree 233 on ODS; Decree 688 on ODS and F-gases; Decree 923 on WEEE; Decree 399 on workplace safety; Decree 61 on workplace protection on ships; Decree 165 pressure vessels; Decree 518 supervision

[313] Decree 688 on ODS and F-gases

information to the State Environment Service on the name of the substance, the source (import or EC), the quantity at the beginning of the year, the quantity added, the intended use, the amount recycled-regenerated-destroyed, and the amount remaining at the end of the year.

2048. The State Environment Service collected the information and passed the raw data to the Latvian Environment, Geology and Meteorology Agency. The State Environment Service reported that there were 107 companies in the database in 2009, a number that has remained relatively constant for the past 3 years. The State Environment Service has about 70 Environmental Inspectors that follow up on potential cases of non-compliance with legislation on chemicals management and pollution control.

2049. The Service reported that there were 107 companies in the database in 2009, a number that has remained relatively constant in the past 3 years.

8.7.5.5.1.3.3 Revers Refrigeration

2050. In order to obtain firsthand information on the recycling and recovery programme, the evaluation team met with one of the servicing companies called Revers Refrigeration[314]. Revers Refrigeration established a Reclamation Centre in Latvia and received from the sub-project a small RTI 220 recovery and recycle unit which was still in operation (Figure 30), and a larger CFC-12 reclamation unit RTI RRC750 which had not been used for 4-5 years. Revers Refrigeration estimated that it had about 5-7% of the market share of the refrigeration business in Latvia.

Figure 30: RTI recovery and recycle equipment (left) and stored ODS (right). Revers Refrigeration, Latvia.

2051. Prior to 2004, Revers Refrigeration received ODS for reclamation 2-3 times per month, typically very small quantities but once 100 kg. There was a charge to the servicing companies of 20-30c/kg for regeneration of the CFCs. Revers reported that the supplies of CFCs dried up before the end of the project. No CFCs were destroyed as all of them were recycled. The quantities recovered, recycled, regenerated and destroyed were reported to the MoE but they were not available for assessment by the evaluation team.

2052. Revers Refrigeration reported that supplies of CFCs dried up before the end of the Institutional Strengthening sub-project in 2007. No CFCs were destroyed as all of them were recycled. Revers said that the quantities of ODS recovered, recycled and reclaimed were small, and the results were reported to the MoE. Revers was not able to provide detailed information on the amounts recovered and recycled each year from 2000 to 2009.

8.7.5.5.1.3.4 Summary of information from Latvia on the recovery of ozone-depleting substances

2053. It was impossible to determine if the information on the quantity of ODS recovered and recycled in Latvia was available, and that it was being held somewhere between the State Environment Service and the Latvian Environment Agency, or that it was not available at all. The Association said that some of the companies in 2009 reported recovered ozone-depleting substances to the State Environment Service, and that a list of companies that still have the equipment was maintained. The results were not made available to the NOU, the companies involved in servicing, and the evaluation team.

2054. The NOU was not able to provide information on the quantities of recovered, recycled and destroyed ozone-depleting substances as a result of the survey from past years. In addition, analysed data from any of the surveys were not available, which would have been useful to see progress on the phase out of ozone-depleting substances. The MoE agreed to supply the data from 2004 to 2008, since data prior to 2004 were not considered reliable. However, the data were not supplied.

[314] No website. Revers Refrigeration, 4c Katalkalna Street, Riga. Tel +371-6724-8316; Fax +371-6724-9062

2055. The evaluation team concluded that, despite the infrastructure being in place to collect information on ozone-depleting substances recovered, there was no data to show the amount of ozone-depleting substances that had been recovered. There was some evidence provided by Revers to indicate that the ozone-depleting substance recovery and recycling equipment had been used to some extent in Latvia during and after the sub-project. There was some evidence that a ozone-depleting substance monitoring and recording system was in place. However, it was not possible to obtain information on the amount of ozone-depleting substances recovered and recycled in Latvia, and therefore it was not possible to determine if Latvia exceeded or not the ODS recovery target of 9.72 ODP tonnes per year for two years.

8.7.5.5.2 Awareness about ODS, ODS substitute technology, and strengthening of institutional capacities for dealing with ODS phase-out

2056. The NOU had undertaken an extensive campaign of Awareness Raising over a 12 month period, beginning in December 2005, to educate Latvian school children on the value of protecting the ozone layer called "*Protect and be Protected*". The details of this work were reported and evaluated in Section 8.7.4.5.1.5 "*ODS awareness programmes designed and implemented*" above.

2057. On ODS substitute technology, the training syllabus covered a range of topics described in paragraph 2039 above and also a description of commercial, domestic, low temperature equipment for use with ODS and F-gases. The NOU was also involved in the work that converted Ritols (foam) and Kvadro (aerosols) to CFC-free technology.

2058. As a result of the Institutional Strengthening sub-project, the capacity of the government to undertake awareness raising activities on ozone layer protection had improved (see Section 8.7.4 above "*GF/2110-99-16 Institutional Strengthening for the Implementation of the Montreal Protocol in Latvia (UNEP)*". The infrastructure for training by the Latvian Refrigeration Engineers Association had also been strengthened by the legislation that required the training of technicians that handled ODS. However, there was no evidence to suggest that Latvia's ability to monitor and report on ODS recovered and recycled had improved as a result of the sub-project.

8.7.5.5.3 Authority / credibility, necessary to influence policy and decision-makers

2059. The NOU that is situated within the MoE is part of the Latvian institutional framework that is responsible for policy on ODS. On ODS issues, the NOU is linked to other departments that have responsibilities for undertaking work on ODS according to national legislation. The other departments include the State Environment Service that monitored consumption and use of ODS and undertook enforcement action when necessary, and the Latvian Environmental Agency that collated and analysed data on ODS. As described above, there was little evidence of a free flow of information from one body to the other which resulted in key information being unavailable to the NOU and the assessment team, such as the data on the amount of ODS that had been recovered and recycled annually.

2060. In this sub-project on recovery and recycling of ODS, the NOU also intended to work with the 60 refrigerator and air conditioning enterprises that handled ODS when servicing ODS-dependent equipment. The NOU reported that the work with the enterprises was more difficult than anticipated and it was put in abeyance until after the Institutional Strengthening sub-project was completed.

2061. There was a 4-5 year delay in establishing the NOU within the MoE, which according to the NOU was due to the reorganisation of many government departments during this period. The lack of NOU at that time held up the implementation of the project, to the extent that UNEP was at the point of abandoning the project.

2062. For these reasons, the ability of the NOU to influence policy and decision-makers in this sub-project on the recovery and recycling of ODS was assessed as minimal and unsatisfactory.

8.7.5.6 Assessment of monitoring and evaluation systems

8.7.5.6.1 Monitoring and evaluation design

2063. The Mid-Term evaluators stated that "*…monitoring and evaluation appears to be well in hand in Latvia, but … without any connection to this [Institutional Strengthening / training] project*".

2064. The Project Document mentioned that monitoring-evaluation was an element in the budget. In addition, "*…project monitoring will be performed by UNEP/UNDP and the cost for it is included in the budgets. Standard evaluation will be performed, except in the case that an in-depth evaluation is required by the GEF whereby independent consultants would have to be hired and fielded to the country concerned. If such would be the case, consultancy fees and travel costs would have to be obtained in addition to the amounts requested herewith to cover these costs*".

2065. The monitoring and evaluation design was not evident in any of the project documents.

8.7.5.6.2 Monitoring and evaluation plan implementation

2066. The Sub-project Document reported that the allocated budget covered "*…the costs of the technical advisory services, the recovery/recycling equipment, contingencies, the cost of the training seminars, national consultant to monitor recovered refrigerant for a 12 month period and project support services / monitoring-evaluation*". No information was provided on how the plan would be implemented.

8.7.5.6.3 Budgeting and Funding for monitoring and evaluation activities

2067. The Sub-project Document mentioned that monitoring-evaluation was an element in the budget. However, the funds for monitoring and evaluation were not defined within the overall budget for the sub-project.

8.7.5.6.4 Long-term monitoring

2068. The Protocol requires reporting on consumption in ODS, which includes quantification of the amount of ODS imported into a country, exported from a country and produced in a country. Annual reporting is therefore required from producers, importers and exporters of controlled substances. The European Commission compiles data submitted by Member States on ODS in order to report data to the Montreal Protocol that is representative of ODS consumption in the European Community. In order to enable the European Commission to streamline the reporting procedures to comply with the Montreal Protocol and to avoid duplications in the process, destruction facilities are required to also report directly to the European Commission[315].

2069. To ensure compliance with reporting obligations under the Protocol and to improve their practical application, the Commission is empowered in Regulation (EC) 1005/2009 to modify the reporting requirements for Member States and companies. In view of the envisaged development of Internet-based reporting tools the Commission should, as appropriate, draft measures to adapt the reporting requirements as soon as the relevant reporting tools are in place[316].

2070. Undertakings operating refrigeration, air conditioning or heat pump equipment, or fire protection systems, are required to keep records on the quantity and type of controlled substances added and the quantity of ODS recovered during maintenance, servicing and final disposal of the equipment or system. They are also required to keep records of other relevant information, including the identification of the company or technician which performed the maintenance or servicing, and the dates and results of the leakage checks carried out. These records are required to be made available on request to the competent authority of a Member State and to the Commission[317].

2071. This contrast with the previous ODS Regulation (EC) 2037/2000 that required Member States to report annually on systems established to promote the recovery of used controlled substances, including the facilities available and the quantities of used ODS recovered, recycled, reclaimed or destroyed. However, despite the requirement that Member States do not have to report to the Commission annually, the fact that the reports need to be available on request would mean that in practice the companies will need to continue to report ODS recovered, recycled, reclaimed or destroyed.

2072. The prospects for long term monitoring in Latvia in response to the legislative requirements were therefore assessed as likely.

---

[315] Preamble No 21 in Regulation (EC) No 1005/2009 on ODS
[316] Preamble No 21 in Regulation (EC) No 1005/2009 on ODS
[317] Article 23(3) of Regulation (EC) No 1005/2009 on ODS

8.7.5.7 Assessment of processes that affected attainment of project results

8.7.5.7.1 Preparation and readiness

2073. The NOU commenced activities on this sub-project many years after it was formally closed by UNDP, which indicated that Latvia was not prepared and ready.

2074. UNDP signed the grant agreement on 18 March 1998. The project was completed in February 2000 when the Certificate of Completion and Handover Protocol were signed by UNDP. The equipment was most likely distributed in 1999 prior to the Certificate of Completion and Handover Protocol being signed by UNDP.

2075. The survey to determine the number of companies in Latvia that were involved in the recovery and recycling of ODS was not undertaken until late 2004, which was immediately after the NOU was established in November 2004. The survey was therefore undertaken almost 5 years after the closure of the sub-project.

2076. The two training sessions that aimed to teach best-practice management of ODS recovery and recycling did not take place between 1999 and 2005, but instead were scheduled for 2005 which was 5 years after the sub-project was formally closed by UNDP.

2077. The evaluation team assessed Latvia was unprepared and unready for this sub-project on the recovery and recycling of ODS.

8.7.5.7.2 Country commitment and motivation

2078. Delays of 4-5 years between project approval and NOU establishment indicated that ozone layer protection was not a priority for Latvia. Therefore, at the time of the project, Latvia was assessed as not committed and motivated.

2079. Since the completion of the project, however, the NOU was established and the responsibilities for monitoring and reporting of ODS consumption were allocated to several government bodies. This indicated a heightened level of commitment and motivation than prior to and during the sub-project, but still not fully committed because of difficulties in obtaining key information from the government related to ODS recovered and recycled, for example.

8.7.5.7.3 Stakeholder involvement

2080. The MoE / NOU that was responsible for the development and implementation of ODS policies, legislation, regulation and any other control measures encouraged a range of stakeholders to become involved, including the State Environmental Inspectorate, the Latvian Environmental Agency, the Finance Ministry (and hence Customs), and the Latvian Refrigeration Engineers Association. The roles of each body were described in paragraph 1953 above. In addition, the NOU involved administrative staff, teachers for awareness raising, schools, national and international consultants, NGOs involved in environmental protection, and companies involved in the recovery and recycling of ODS.

2081. The partnerships formed as a result of these relations, although established after the closure of the sub-project, were assessed as creating effective stakeholder participation to progress the work of the NOU and the MoE in ozone layer protection.

8.7.5.7.4 Financial planning

2082. There were no reports available by UNDP on financial planning within this sub-project. In regard to the training aspect which was funded from the Institutional Strengthening sub-project, UNEP reported errors in expenditure reporting by Latvia and UNEP initially, and by UNEP when the project was first re-activated in 2003. This was due to an initial disbursement to Latvia by UNEP in 1999 in anticipation of the start of the Project, but there was no subsequent report by Latvia on the use of these funds because neither the NOU nor the financial reporting structure had been established. After 2004 and when the NOU had been established, UNEP reported that financial reporting was satisfactory, once the NOU and the Project FMO and Task Manager had rectified inaccuracies in the financial reports.

8.7.5.7.5 UNEP / UNDP supervision and support

2083. UNEP was the lead agency in the Country Programme preparation and in the implementation of

Institutional Strengthening and Capacity Building, awareness raising and training activities. UNEP DTIE (Paris) was the responsible supervising organisation from the inception of the NOU in Estonia in 2000 until 2003. This period was the period of initiation and learning for the newly formed NOU. UNEP GEF (Nairobi) took over the supervisory role from 2004 onwards.

2084. UNEP made many attempts between 1999 and 2004 to establish a working relationship with Latvia on the Institutional Strengthening sub-project, and was on the verge of giving up on this Project. The Project was only possible once the NOU had been established in 2004. From that time onwards, the UNEP Task Manager worked with the NOU to revise the Work Plan. One of the outcomes was that the Progress Reports for June-December 2004 and Jan-June 2005 were received on time, with accompanying financial reporting. Prior to this time, the Progress Reports were not being submitted by Latvia to UNEP, and the financial reports sent to UNEP by Latvia were not satisfactory. The evaluation team assessed UNEP supervision and support as highly satisfactory.

2085. UNDP was the lead agency for the recovery and recycling sub-project. In all the projects that involved provision of equipment, UNDP took responsibility for tendering and procurement of the equipment, and delegated responsibility for its distribution to the local government. The assessment team assumed UNDP applied the same conditions to Latvia, as no documents were available that indicated otherwise. On this basis, the evaluation team assessed UNDP supervision and support as satisfactory.

8.7.5.7.6 Co-financing and project outcomes & sustainability

2086. There was no co-finance in the sub-project on ODS recovery and recycling. The lack of co-finance was assessed as unlikely to have affected the sustainability of ODS recovery and recycling activities after the sub-project was concluded, because companies that did not receive equipment and that were not included in the sub-project purchased their own equipment. In addition, the EU legislative requirements for the recovery and recycling of ODS were assessed as more likely to have a greater impact on sustainability than co-finance. These legislative factors were discussed in Section 8.7.5.3.4 "*Environmental*" above.

8.7.5.7.7 Project implementation delays and impact on project outcomes & sustainability

2087. Discussion with Revers Refrigeration, which was one of the two Recovery and Reclamation Centres established in Latvia (see paragraph 2051 above), indicated that the sub-project had been initiated too late as most of the CFCs had already been emitted from equipment several years earlier. The delay in the establishment of the NOU was assessed as having reduced the potential to recover and recycle ODS.

2088. However, the ODS recovery and recycling and training of technicians continued after the project was completed, due mainly to the requirement to comply with legislative measures in the EU. For example, in February 2005 the RAL Quality Assurance Association reported that Latvia had neither a procedure in place for the recovery of ODS from the compressor of discarded refrigerators, nor a procedure for extraction of ODS from the foam (which contains more CFCs than the compressor). In 2009, the MoE had partly addressed this issue and advised that a Finnish company (Kuusarkoski OY) collected unwanted refrigerators and sent them for destruction in Finland (for ODS extraction from the foam and compressor?); and a second company (JSC Bao) was reported to extract the ODS from the compressor and to send the ODS for destruction within the EU.

8.7.5.8 Sub-Project Rating

LAT/97/G34 - National programme for recovery and recycling of ODS refrigerants (UNDP/UNOPS)		
Criterion	**Evaluator's Summary Comments**	**Evaluator's Rating**
Attainment of project objectives and results	See comments below	U

LAT/97/G34 - National programme for recovery and recycling of ODS refrigerants (UNDP/UNOPS)		
Criterion	**Evaluator's Summary Comments**	**Evaluator's Rating**
Sub criteria (in yellow below)		
Effectiveness	Recovery and recycling of ODS took place without NOU guidance and after UNDP closed the project; training took place before and after the project; no information was provided to assess if the ODS target had been met	U
Relevance	Project was relevant for minimising the detrimental effect of ODS on the ozone layer, and for improving the prospects of Latvia's compliance with EU legislation	S
Efficiency	Not assessable as data on the amount of ODS recovered and recycled were not available	U
Sustainability of Project outcomes (overall rating) Sub criteria (in yellow below)	See comments below	S
Financial	No expenditure information was made available; technicians paid for their own courses; government does not finance a programme to encourage recovery and recycling of ODS	S
Socio-Political	Latvian Refrigeration Engineers Association is the key body that is largely independent of the government and that organises and undertakes the training of technicians	S
Institutional framework and governance	Satisfactory framework that would encourage activities on ODS recovery and recycling, but the results of ODS data analysis were not available	S
Environmental	EU legislation promotes sustainability of the ODS recovery and recycling activities.	S
Achievement of outputs and activities		S
Monitoring and Evaluation (overall rating) Sub criteria (in yellow below)	See below	
M&E Design	The monitoring and evaluation design was not evident in any of the project documents	U
M&E Plan Implementation (use for adaptive management)	No information was provided on how the plan would be implemented	U

LAT/97/G34 - National programme for recovery and recycling of ODS refrigerants (UNDP/UNOPS)		
Criterion	**Evaluator's Summary Comments**	**Evaluator's Rating**
Budgeting and Funding for M&E activities	Funds for monitoring and evaluation were not defined within the overall budget for the sub-project	U
Catalytic Role	No categorisation required	
Preparation and readiness	NOU activities commenced 4-5 years after UNDP formally closed the project, therefore Latvia was unprepared and unready	U
Country commitment and motivation*	At the time of the project, Latvia showed a low level of country commitment and motivation. After the project was closed by UNDP, Latvia allocated responsibilities to key government departments for ODS monitoring and reporting, which was evidence of greater commitment and motivation.	S
Stakeholders' involvement	Effective stakeholder participation encouraged progress on the work of the NOU and the MoE in ozone layer protection	S
Financial planning	No reports available by UNDP on financial planning within this sub-project	U
UNEP supervision and support**	UNDP provided support for procurement of equipment, but other support was not evident	S
Overall Rating		S

Highly Satisfactory (HS); Satisfactory (S); Moderately Satisfactory (MS); Moderately Unsatisfactory (MU); Unsatisfactory (U); Highly Unsatisfactory (HU);
*Motivation replaced TOR '*driveness*'; **Support replaced TOR 'backshopping'

8.7.6 LAT/97/G31 Sectoral phase-out of CFCs in aerosol industry (UNDP/UNOPS)

8.7.6.1 Introduction

2089. This sub-project on aerosols aimed to eliminate the use of CFCs consumed by two aerosol enterprises by converting their operations to hydrocarbon propellants. However, both companies went bankrupt during the formulation phase of the project, and the funds were instead allocated to a third aerosol company.

2090. The equipment was installed in May 2001. UNDP-UNOPS visited the facility in August 2001 and issued a Certificate of Completion. It was not clear if the original project budget of $954,400 had been reduced to take account of the smaller size of third company compared to the two companies that went bankrupt. The sub-project included funds for technical advice, capital equipment, training in operational safety, contingencies and project support services including monitoring and evaluation.

8.7.6.2 Attainment of objectives and planned results

8.7.6.2.1 Effectiveness

2091. This objective of this two year sub-project on aerosols was to eliminate 201.4 ODP-tonnes of CFC-11, CFC-12 and CFC-113 that were consumed annually by Lars-M and Aerosol-1 companies,

by converting their operations to hydrocarbon-based propellant. Elimination of this quantity of CFCs was significant as it represented about 45% of the total sectoral consumption of ODS in the aerosol sector in 1995. However, both companies went bankrupt during the formulation phase of the project, and the funds were instead allocated to Kvadro that consumed about 2% of the ODS in that sector.

2092. Within the term of the project 5 tonnes of CFCs that were consumed annually by Kvadro were replaced by hydrocarbon propellant. The conversion of the plant was assessed as highly satisfactory.

8.7.6.2.2 Relevance

2093. The elimination of CFCs for aerosol production in Latvia was consistent with the objectives of the Vienna Convention and the Montreal Protocol, which *requires Parties to take appropriate measures in accordance with the provisions of this Convention and of those Protocols in force to which they are party to protect human health and the environment against adverse effects resulting or likely to result from human activities which modify or are likely to modify the ozone layer*[318]. CFCs are relatively strong ozone depleting substances, and therefore their elimination was consistent with the objectives of the Vienna Convention and the Montreal Protocol.

2094. The GEF established in 1995 an Ozone Layer Depletion Focal Area in response to the Montreal Protocol. The Focal Area has the strategic objective of protecting human health and the environment by assisting countries to phase out their consumption and production of ODS, to prevent emissions of ODS, and to encourage the uptake of alternative technologies and practices according to a country's commitments under the Montreal Protocol. The financial interventions in the GEF Focal Area contribute to the return of the ozone layer to pre-1980 ozone levels, which is expected by 2065.

2095. Most recently, the dual capability of ODS to both reduce ozone and to have a detrimental impact on the climate have been described[319]. Global ODS consumption in 1989 was equivalent to about 9,200 million tonnes (9 Gt) CO_2-eq/year, which was reduced to about 1,870 million tonnes (1.8 Gt) CO_2-eq/year in 2007 as a result of ODS phase-out activities under the Montreal Protocol. This reduction of about 7 Gt CO_2-eq/year was at least three times greater than the Kyoto Protocol's reduction target (about 1-2 Gt CO_2-eq/year in 2008-2012), demonstrating that the global ODS reductions achieved so far have already yielded a larger climate benefit than the current Kyoto Protocol target.

2096. The reduction and phase out of ODS prior to Latvia's accession to the EU was relevant for avoiding non-compliance with EU legislation on ODS that applied shortly after accession in May 2004.

2097. The actions taken by Latvia to phase out ODS in the aerosol sector was therefore relevant to further protection of the ozone layer (Montreal Protocol), accession to the EU, and relevant to reducing the impact of radiative forcing of the climate (Kyoto Protocol).

8.7.6.2.3 Efficiency

2098. The cost-effectiveness was $191 ODP-kg per year, based on a project cost of $954,400 to phase out 5 tonnes of CFCs per year.

2099. The MLF reported no clear correlation between the size of an aerosol project and its cost-effectiveness, neither in relation to the volume of funding nor the CFC consumption phased out[320] (Figure 31). The MLF also reported a rather wide range of values for the actual cost-effectiveness, , from less than $1.00 to almost $9.00 ODP-kg per year. Only four projects were approved above the $4.40 ODP-kg per year, and the remainder were below this value[321]. The average was approximately $3.00 ODP-kg per year, for quantities phased out up to about 100 ODP-tonnes per year. The 35 projects evaluated by the MLF were 45% of all 77 projects

---

[318] Handbook for the Vienna Convention for the Protection of the Ozone Layer - 7th Edition (2006). Article 2: General Obligations.

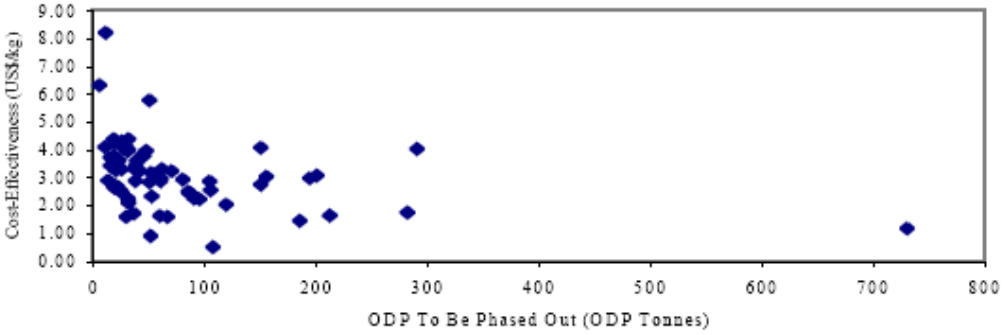
[319] Velders, J.M., Andersen, S.O., Daniel, J.S., Fahey, D.W. and M. McFarland. 2007. The Importance of the Montreal Protocol in protecting climate. http://www.pnas.org/content/104/12/4814.abstract

[320] MLF. 2002. Final report on the evaluation of aerosol products. UNEP/OzL.Pro/ExCom/38/5/Corr.1. See Annex III for cost-effectiveness.

[321] The three aerosol projects that had been completed in China at the time of the evaluation were excluded from the because they reported ODP phase-out of 4,000 to 6,000 tonnes each would have altered the scale.

completed by the end of 2001 and 32% of 108 projects approved by July of 2002.

Figure 31: Actual cost-effectiveness of MLF-financed aerosol projects in developing countries that were completed or approved before July 2002



2100. The cost-effectiveness of the phase out of CFCs at Kvadro in Latvia at $191 ODP-kg per year was about 40 times more expensive than the average cost-effectiveness of MLF-funded aerosol projects in developing countries.

8.7.6.3 Assessment of sustainability of project outcomes

8.7.6.3.1 Financial resources

2101. It was not clear if the original project budget of $954,400 had been reduced to take account of the reduced amount of CFCs to be phased out of 5 tonnes instead of 201.4 ODP-tonnes. The funds were for the provisions of technical advisory services, capital equipment, training in operational safety, contingencies and project support services including monitoring-evaluation. Operational costs of $295,762 over a 4-year period were calculated, but were not claimed as the GEF rules did not support such a claim.

2102. Kvadro doubled their production of aerosols over a 6 year period beginning from the end of the Project in 2001. The quantities of aerosols that were being produced continued to increase despite the economic recession in Latvia. Kvadro continue their normal operations of 8h per day / 5 days per week, despite the economic crisis. The sub-project was assessed as financially sustainable.

Figure 32: Aerosol manufacturing facility (top) and propane-butane tanks (below). Kvadro Aerosols, Latvia.

8.7.6.3.2 Socio-political

2103. Several organisations assisted Kvadro to implement hydrocarbon technology, including Aerofil that installed the line and the propellant in exterior storage tanks. Kvadro said they were very satisfied with the installation by Aerofil experts that spent about 6 months in Latvia completing the installation and testing the plant. They were very satisfied with the availability and quick delivery of parts from Aerofil. The MoE worked well with UNDP to formulate the project and to procure the equipment. The technology is highlighted on their website as an asset to potential clients. The plant operated with relatively few staff (less than 6) and would be an unlikely target for labour unions that normally work with enterprises with much larger work forces.

2104. For these reasons, the social and political risks influencing the operations of Kvadro were

assessed as low and that as a result Kvadro's operations were assessed as having good prospects for sustainability.

8.7.6.3.3 Institutional framework and governance

2105. UNDP reported in 2003 that the Project Document had been developed but not signed. As the equipment was installed in May 2001, the assessors assumed that the project was approved in late 1999 or early 2000.

2106. Kvadro reported that the MoE had been very helpful in supporting the implementation of the equipment and in providing administrative assistance when required. The MoE was also reported by Kvadro to have worked well with UNDP to formulate the project and to procure the equipment.

2107. The institutional framework and governance was assessed as supportive and likely to promote the sustainability of Kvadro's operations.

8.7.6.3.4 Environmental

2108. There were no environmental risks that were assessed as potentially undermining Kvadro's operations in the future. The phase out of CFCs and their replacement with hydrocarbons avoids any future compliance issues as they are no longer subject to legislation on ozone depleting substances or to legislation governing climate gases. Kvadro conducted safety inspection and obtained a permit for the use of hydrocarbons in Latvia (Figure 32). In addition, the production facility was situated in a rural area away from housing and other suburban facilities that might otherwise restrict its operations.

8.7.6.4 Catalytic role

2109. The key factors influencing catalytic action are *innovation, demonstration, replication* and *cooperation*. At the time of the project formulation there were only three aerosol companies in Latvia. The largest two companies went bankrupt leaving only Kvadro eligible for funding. Since Kvadro was the only aerosol company operational at the time, there was no opportunity for catalytic action.

8.7.6.5 Achievement of outputs and activities

8.7.6.5.1 Delivered outputs

2110. Kvadro is a contract-filler aerosol company that was established in 1991 in Latvia. The facility, located about 15 km from Riga, makes about 7 million aerosols per year for household, automotive, pest control and cosmetic uses. Kvadro has a staff of 4-5 people that operate the line and a small laboratory facility with 3 staff. The Project financed the replacement in 2001 of 5t per year of CFCs. The delivered output was the successful replacement of CFCs with hydrocarbon (propane-butane) propellant.

2111. As a result of the replacement of the CFCs with better aerosol technology, Kvadro doubled their production of aerosols over a 6 year period after the Project ended in 2001 (Figure 33).

2112.

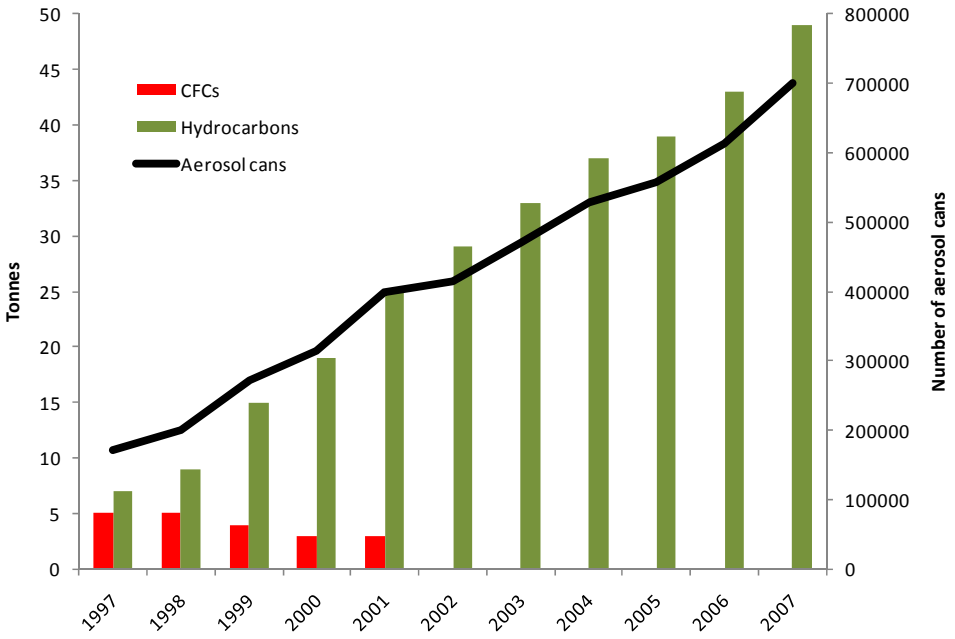


Figure 33: Replacement of CFCs with hydrocarbon technology for the production of household aerosols, and impact on production

2113. Kvadro reported that the installation of the high-quality line and hydrocarbon storage facility was timely, and efficiently installed.

8.7.6.5.2 Awareness of ODS, ODS substitute technology and strengthening of institutional capacities for dealing with ODS phase-out

2114. Kvadro intended to use CFCs for as long as possible, and at the time of the project they were not aware that CFCs were required to be phased out. Kvadro reported that the MoE was helpful in explaining the requirement to phase out CFCs, and to suggest that the solution might be eligible for international finance.

2115. Kvadro was aware of alternatives to ODS since they were networked with Russian facilities that were also undergoing conversion away from CFCs. The selection of an alternative was also reinforced by similar information provided by MoE.

2116. The Latvian government had introduced a tax on imports of ODS in 1997, and it had established import quotas for CFCs, HCFCs and CTC. Kvadro was therefore aware that CFCs were likely to be restricted and banned in the future, and that CFC-free technology needed to be adopted in order to allow their aerosol operations to continue.

8.7.6.5.3 Authority / credibility, necessary to influence policy and decision-makers

2117. Kvadro operates a small aerosol production facility that had little ability to influence policy and decision-makers. Instead, Kvadro cooperated with the MoE that in turn had an ability to influence policy and decision-makers. The MoE also cooperated with international funding and implementing agencies such as the GEF and UNDP.

8.7.6.6 Assessment of monitoring and evaluation systems

8.7.6.6.1 Monitoring and evaluation design

2118. The monitoring and evaluation design was not evident in any of the project documents.

8.7.6.6.2 Monitoring and evaluation plan implementation

2119. A UNDP/UNOPS expert visited the facility in August 2001 and issued a Certificate of Completion. Subsequently, UNOPS issued a Handover Protocol and transferred ownership of the equipment to Kvadro, and declared the project complete. There was no report by Kvadro or the NOU that suggested UNDP visited during the installation of the equipment, probably because this was undertaken over a 6 month period by Aerofil.

8.7.6.6.3 Budgeting and Funding for monitoring and evaluation activities

2120. The Sub-project Document mentioned that monitoring-evaluation was an element in the budget. However, the funds for monitoring and evaluation were not defined within the overall budget for the sub-project.

8.7.6.6.4 Long-term monitoring

2121. The phase out of CFCs and their replacement with hydrocarbons avoided the need for future compliance with legislation on ozone depleting substances and climate gases. Kvadro conducted safety inspection and obtained a permit for the use of hydrocarbons in Latvia, and therefore complied with Latvian (and EU) safety legislation. In addition, the production facility was situated in a rural area away from housing and other suburban facilities that might otherwise require further monitoring of its operations.

2122. For these reasons, the evaluation team assessed the need for long-term monitoring of the facilities as low. In addition, any monitoring that was undertaken was unlikely to affect the sustainability of Kvadro's operations since the installation of hydrocarbon technology avoided the need for compliance with legislation on ozone depleting substances and climate gases.

8.7.6.7 Assessment of processes that affected attainment of project results

8.7.6.7.1 Preparation and readiness

2123. Kvadro welcomed the installation of the equipment and shut down its operations during the installation phase. Kvadro was well prepared and ready for the installation.

8.7.6.7.2 Country commitment and motivation

2124. The installation of CFC-free technology was consistent with the policies and measures of the MoE, which was to reduce and eliminate the use of CFCs as soon as possible. Latvia had also been invited to explain its compliance status with the Montreal Protocol's Implementation Committee three times. Therefore, in the eyes of the international community, Latvia was under pressure to become compliant with international norms at the earliest opportunity.

2125. In 1996, Latvia notified the Implementation Committee that it would be in non-compliance with the Montreal Protocol, and that despite efforts it was making to eliminate ODS using its own finances, the state of non-compliance was likely to continue into the future[3]. Latvia was urged by the Parties to ratify the London Amendment, and funding agencies were recommended to consider providing financial assistance. At the second meeting in 1997, the Committee noted that Latvia had not yet ratified the London Amendment. The Committee recommended that international assistance should be provided, particularly from the GEF, to assist Latvia to realise the ODS reduction and phase out objectives established in its country programme[3].

2126. At the third meeting in 1998, the Committee noted that Latvia had made significant progress in reducing the consumption of CFCs[322]. This had been achieved by applying a tax on CFC imports, in agreement with the industry. The Committee noted in particular that ODS was being used in aerosol applications, for which there were cheaper alternatives available, and that ODS phase out projects were being initiated rather late. In Decision X/24, the Parties noted Latvia's commitments to:

- Observe the ban on the production and import of Annex A, Group II, substances imposed on 12 December 1997;
- Limit consumption of Annex A, Group I, substances to no more than 100 metric tonnes in 1999; and
- Ban the production and import of Annex A, Group I, and all Annex B substances by 1 January 2000;

2127. The Committee noted that Latvia would need to strictly apply its import quota restrictions already in place to meet these commitments.

2128. As elimination of the use of CFCs by Kvadro can be regarded as a step toward full compliance by

[322] Decision X/24 (1998): Compliance with the Montreal Protocol by Latvia. See also earlier Decisions VIII/22 (1996) and IX/29 (1997) as a result of discussions with representatives from Latvia in the Implementation Committee.

Latvia, the delay in enforcing the CFC ban and the delay in enforcing the quota restrictions for CFCs were assessed in this evaluation as indicative of a lack of commitment and motivation by Latvia toward achieving full compliance with the requirements of the Montreal Protocol.

8.7.6.7.3 Stakeholder involvement

2129. There were relatively few stakeholders involved in this sub-project as the project required only cooperation between Kvadro, Aerofil, UNDP and the MoE. The partnerships formed as a result of this cooperation were assessed as creating effective stakeholder network to progress the phase out of CFCs in the aerosol sector.

8.7.6.7.4 Financial planning

2130. There were no reports available by UNDP on financial planning in this sub-project, such as financial controls, reporting and management. Kvadro did not report any financial difficulties associated with payments for the equipment or its installation and testing.

8.7.6.7.5 UNDP supervision and support

2131. UNDP was the lead agency for the replacement of CFCs with hydrocarbons in the production of aerosols at Kvadro. In all the projects that involved provision of equipment, UNDP took responsibility for tendering and procurement of aerosol filler equipment, and for organising its installation. The assessment team assumed UNDP applied the same conditions to the equipment required to convert Kvadro to CFC-free technology, as no documents were available that indicated otherwise. On this basis, the evaluation team assessed UNDP supervision and support as satisfactory.

8.7.6.7.6 Co-financing and project outcomes & sustainability

2132. This sub-project included technical advisory services, capital equipment, training in operational safety, contingencies and project support services including monitoring-evaluation. Although there was no co-finance by Kvadro, the operational costs of $295,762 paid over a 4-year period by Kvadro, which were not claimed as the GEF rules did not support such a claim, could be considered as a form of co-finance.

8.7.6.7.7 Project implementation delays and impact on project outcomes & sustainability

2133. As noted by the Montreal Protocol's Implementation Committee, there were cheaper alternatives to CFCs available for aerosol production and that ODS phase out projects were being initiated rather late in Latvia.

2134. Despite the delay in initiating the project, the delay was assessed as not having a major impact on sustainability. As a result of the replacement of the CFCs with better aerosol technology, Kvadro doubled their production of aerosols over a 6 year period after the Project ended in 2001 (see Figure 33 above).

8.7.6.8 Sub-Project Rating

LAT/97/G31 Sectoral phase-out of CFCs in aerosol industry (UNDP/UNOPS)		
Criterion	**Evaluator's Summary Comments**	**Evaluator's Rating**
Attainment of project objectives and results Sub criteria (in yellow below)	See comments below	S
Effectiveness	CFCs were replaced by hydrocarbons in Kvadro aerosol-producing facility	HS
Relevance	Conversion to non-ODS technology is consistent with minimising the detrimental effect of ODS on the ozone layer	HS

LAT/97/G31 Sectoral phase-out of CFCs in aerosol industry (UNDP/UNOPS)		
Criterion	**Evaluator's Summary Comments**	**Evaluator's Rating**
Efficiency	The project was about 40 times more expensive than similar projects financed in developing countries	U
Sustainability of Project outcomes (overall rating) Sub criteria (in yellow below)	See comments below	S
Financial	Expenditure reports for the project were not available. The budget was very large the 5 ODS-tonnes of CFCs that were phased out. Production at the plant increased each year and doubled 6 years after installation of the new equipment. The facility appeared to be financially sustainable	S
Socio-Political	Low socio-political risk	S
Institutional framework and governance	The institutional framework and governance was assessed as supportive and likely to promote the sustainability of Kvadro's operations	HS
Environmental	No environmental risks to potentially undermine Kvadro's operations as their operations are not subject to ODS or climate gas legislation, and the plant has permits for hydrocarbon use and storage	HS
Achievement of outputs and activities		S
Monitoring and Evaluation (overall rating) Sub criteria (in yellow below)	See below	
M&E Design	Not evident in any of the project documents	U
M&E Plan Implementation (use for adaptive management)	There was no evidence of the implementation of an M&E plan	U
Budgeting and Funding for M&E activities	Budget for M&E not defined	U
Catalytic Role	No categorisation required	
Preparation and readiness	Kvadro was well prepared and ready for the installation of the CFC-free technology	S
Country commitment and motivation*	Delay in this project indicated a lack of commitment and motivation by Latvia toward achieving full compliance with the requirements of the Montreal Protocol	HS

LAT/97/G31 Sectoral phase-out of CFCs in aerosol industry (UNDP/UNOPS)		
Criterion	**Evaluator's Summary Comments**	**Evaluator's Rating**
Stakeholders' involvement	Effective stakeholder participation facilitated the conversion to CFC-free technology and the work of the NOU and the MoE in ozone layer protection	S
Financial planning	No reports by UNDP of financial control and management	Unable to assess
UNEP supervision and support**	Tendering and procurement; no evidence of a visit by UNDP staff, probably because Aerofil took responsibility for the installation	S
Overall Rating		S

Highly Satisfactory (HS); Satisfactory (S); Moderately Satisfactory (MS); Moderately Unsatisfactory (MU); Unsatisfactory (U); Highly Unsatisfactory (HU);
*Motivation replaced TOR '*driveness*'; **Support replaced TOR 'backshopping'

8.7.7 LAT/97/G33 Phase out of the use of CFCs in the manufacture of rigid polyurethane foam at Ritols (UNDP/UNOPS)

8.7.7.1 Introduction

2135. This two year sub-project phased out CFC-11 that was used in the production of rigid polyurethane foam by one enterprise (Ritols). The CFCs were replaced by water-blown technology. The project included the replacement of existing low pressure foam dispensers with new spray foam dispensers.

2136. The project was Project Document was signed in March 1999. The project was completed in February 2000. The project budget of $106,000 financed the provision of technical advice, capital equipment, training in operational safety, contingencies and project support services including monitoring and evaluation.

8.7.7.2 Attainment of objectives and planned results

8.7.7.2.1 Effectiveness

2137. This two year sub-project aimed to phase out 9.72 ODP-tonnes of CFC-11 that were used in the production of rigid polyurethane spray foam by the enterprise Ritols.

2138. The cost-effectiveness was $8.15 ODP-kg per year, based on a project cost of $106,000 to phase out the consumption of 9.72 ODP tonnes of CFCs per year. The MLF (2001) reported that the cost-effectiveness of 5 polyol (spray) foam projects completed in developing countries averaged $0.54 ODP-kg per year[323].

2139. The cost-effectiveness of the sub-project to phase out the use of CFCs in Ritols was assessed as about 20-times more expensive as the average cost-effectiveness of the conversion to CFC-free technology in polyol (spray) foam projects financed in developing countries by the MLF.

2140. The project was completed in about within 11 months, which was about half the estimated time to complete the project. The CFCs were totally replaced by water-blown technology. The project included the replacement of existing low pressure foam dispensers with new spray foam dispensers. The conversion to CFC-free technology was assessed as satisfactory, despite the cost-effectiveness being relatively low compared to similar conversions in other countries.

8.7.7.2.2 Relevance

2141. The elimination of CFCs for foam production in Latvia was consistent with the objectives of the Vienna Convention and the Montreal Protocol, which *requires Parties to take appropriate*

[323] MLF. 2001. Final Report on the Evaluation of Foam Projects. UNEP/OzL.Pro/ExCom/33/6. Table 12 on page 18.

measures in accordance with the provisions of this Convention and of those Protocols in force to which they are party to protect human health and the environment against adverse effects resulting or likely to result from human activities which modify or are likely to modify the ozone layer[324]. CFCs are relatively strong ozone depleting substances, and therefore their elimination was consistent with the objectives of the Vienna Convention and the Montreal Protocol.

2142. The GEF established in 1995 an Ozone Layer Depletion Focal Area in response to the Montreal Protocol. The Focal Area has the strategic objective of protecting human health and the environment by assisting countries to phase out their consumption and production of ODS, to prevent emissions of ODS, and to encourage the uptake of alternative technologies and practices according to a country's commitments under the Montreal Protocol. The financial interventions in the GEF Focal Area contribute to the return of the ozone layer to pre-1980 ozone levels, which is expected by 2065.

2143. Most recently, the dual capability of ODS to both reduce ozone and to have a detrimental impact on the climate have been described[325]. Global ODS consumption in 1989 was equivalent to about 9,200 million tonnes (9 Gt) CO_2-eq/year, which was reduced to about 1,870 million tonnes (1.8 Gt) CO_2-eq/year in 2007 as a result of ODS phase-out activities under the Montreal Protocol. This reduction of about 7 Gt CO_2-eq/year was at least three times greater than the Kyoto Protocol's reduction target (about 1-2 Gt CO_2-eq/year in 2008-2012), demonstrating that the global ODS reductions achieved so far have already yielded a larger climate benefit than the current Kyoto Protocol target.

2144. The reduction and phase out of ODS prior to Latvia's accession to the EU was relevant for avoiding non-compliance with EU legislation on ODS that applied shortly after accession in May 2004. In the EU, CFCs were banned for foam production after 31 December 1994 under Regulation EC 3093/94[326].

2145. The actions taken by Latvia to phase out ODS in the aerosol sector was therefore relevant to further protection of the ozone layer (Montreal Protocol), accession to the EU, and relevant to reducing the impact of radiative forcing of the climate (Kyoto Protocol).

8.7.7.2.3 Efficiency

2146. The cost-effectiveness was $10.91 ODP-kg per year, based on a project cost of $106,000 to phase out the consumption of 9.72 ODP tonnes of CFCs per year. The MLF (2001) reported that the cost-effectiveness of 5 polyol (spray) foam projects completed in developing countries averaged $0.54 ODP-kg per year[327].

2147. The cost-effectiveness of the sub-project to phase out the use of CFCs in Ritols was assessed as about 20-times more expensive as the average cost-effectiveness of the conversion to CFC-free technology in polyol (spray) foam projects financed in developing countries by the MLF.

8.7.7.3 Assessment of sustainability of project outcomes

8.7.7.3.1 Financial resources

2148. The Project Document was signed in March 1999. The project was completed in February 2000. The project budget was $106,000 which had been reduced to take account of the smaller size of Ritols compared to the two foam companies that went bankrupt.

2149. The sub-project included funds for technical advice, capital equipment, training in operational safety, contingencies and project support services including monitoring and evaluation. Operational costs of $57,456 over a 4-year period were calculated, but were not claimed as the GEF rules did not support such a claim.

2150. Ritols reported to the assessment team that their operations continued 4-5 days per week even during the economic crisis. Their work mostly involved improving the insulation of existing rather than new buildings. Ritols operated three teams that apply foam insulation to residential

---

[324] Handbook for the Vienna Convention for the Protection of the Ozone Layer - 7th Edition (2006). Article 2: General Obligations.

[325] Velders, J.M., Andersen, S.O., Daniel, J.S., Fahey, D.W. and M. McFarland. 2007. The Importance of the Montreal Protocol in protecting climate. http://www.pnas.org/content/104/12/4814.abstract

[326] Article 4(1): Control of the supply of controlled substances

[327] MLF. 2001. Final Report on the Evaluation of Foam Projects. UNEP/OzL.Pro/ExCom/33/6. Table 12 on page 18.

and public buildings, production facilities, tanks and pipelines. Unlike new buildings where construction was stopped, existing buildings were not as affected by the economic crisis. The sub-project was assessed as financially sustainable.

8.7.7.3.2 Socio-political

2151. There were few organisations that were required to assist Ritols to implement the water-blown technology. Intergan supplied the new spray foam dispensers. Ritols reported that the MoE worked well with UNDP to formulate the project and to procure the equipment.

2152. Ritols said they were very satisfied the equipment. Two of the machines were cannibalised to keep the third machine operational. Ritols generally amortized equipment after 10 years. The company was therefore very satisfied with the performance of the equipment, taking into consideration that the materials used in the machines were quite abrasive and that the machines were almost 10 years old.

2153. For these reasons, the social and political risks influencing the operations of Ritols were assessed as low and that as a result Ritols' operations were assessed as having good prospects for sustainability.

8.7.7.3.3 Institutional framework and governance

2154. Ritols reported that the MoE had been very helpful in providing support for the equipment and in providing administrative assistance when required. The MoE was also reported by Ritols to have worked well with UNDP to formulate the project and to procure the equipment.

2155. The institutional framework and governance was assessed as supportive and likely to promote the sustainability of Ritols operations.

8.7.7.3.4 Environmental

2156. There were no environmental risks that were assessed as potentially threatening to the continuation of the Ritols' operations in the future. The phase out of CFCs and their replacement with water-based technology was a permanent solution. Water-based technology is not subject to legislation on ozone depleting substances or to legislation governing climate gases. The change to the new technology required the use of the same safety suits.

2157. Ritols also valued contacts that the company had made with EU counterparts as a result of the Project, in particular the EU 7th Framework Programme FORBIOPLAST, which aims to use plant rather than petrochemical sources for polyurethane foam.

8.7.7.4 Catalytic role

2158. The key factors influencing catalytic action are *innovation, demonstration, replication* and *cooperation*. At the time of the project formulation there were only three rigid foam producing companies in Latvia. Ritols was uncertain if the equipment for producing CFC-free foam encouraged the other companies operational at the time to purchase CFC-free equipment.

8.7.7.5 Achievement of outputs and activities

8.7.7.5.1 Delivered outputs

2159. Ritols is a privately owned company in Latvia that was established in 1991. The sub-project budgeted $106,000 to finance the replacement of 9.72 ODP-tonnes of CFC-11 with water-blown technology for the production of rigid polyurethane spray foam insulation. At the time of the Project, Ritols accounted for 80% of the consumption of CFCs in the foam sector.

2160. The delivered output was the elimination of 9.72 ODP-tonnes of CFC-11. The output was delivered in less than 12 months after signature of the Project Document, which originally estimated a project duration of two years.

2161. The replacement of the CFCs with water-blown technology was assessed as highly satisfactory.

8.7.7.5.2 Awareness about ODS, ODS substitute technology, and strengthening of institutional capacities for dealing with ODS phase-out

2162. The technical director of Ritols is also a researcher in polyurethane chemistry at the Latvian State Institute of Wood Chemistry. His qualifications and experience resulted in him being aware of

the need to eliminate CFC-based technology in the production of rigid foam, and the alternatives that were available. He had attended conferences and other meetings in Europe that had discussed alternatives. The choices of alternatives were similar to those being proposed by MoE.

2163. The Latvian government had introduced a tax on imports of ODS in 1997, and it had established import quotas for CFCs, HCFCs and CTC. Ritols was therefore aware that CFCs were becoming more difficult to obtain and their price was increasing at that time. CFC-free technology needed to be adopted by the company in order to allow their spray foam business to continue profitably.

8.7.7.5.3 Authority / credibility, necessary to influence policy and decision-makers

2164. Ritols operated a small rigid foam production team that had little ability to influence policy and decision-makers. Instead, Ritols cooperated with the MoE that in turn had an ability to influence policy and decision-makers. The MoE also cooperated with international funding and implementing agencies such as the GEF and UNDP.

8.7.7.6 Assessment of monitoring and evaluation systems

8.7.7.6.1 Monitoring and evaluation design

2165. The monitoring and evaluation design was not evident in any of the project documents.

8.7.7.6.2 Monitoring and evaluation plan implementation

2166. UNDP/UNOPS issued a Certificate of Completion and Handover Protocol to transfer ownership of the equipment to Ritols, and declared the project complete in February 2000. There was no report by Ritols or the NOU that suggested UNDP visited during the installation of the equipment, probably because this was not necessary given the expertise that already existed within Ritols. Therefore there was no implementation of the M&E plan.

8.7.7.6.3 Budgeting and Funding for monitoring and evaluation activities

2167. The Sub-project Document mentioned that monitoring-evaluation was an element in the budget. However, the funds for monitoring and evaluation were not defined within the overall budget for the sub-project.

8.7.7.6.4 Long-term monitoring

2168. The phase out of CFCs and their replacement with water-based technology for spraying rigid foam avoided the need for future compliance with legislation on ozone depleting substances and climate gases. Ritols provided safety suits to their staff applying the spray to comply with national policies on safety.

2169. For these reasons, the evaluation team assessed the need for long-term monitoring of the facilities as low. In addition, any monitoring that was undertaken was unlikely to affect the sustainability of Ritols operations since the installation of water-based technology avoided the requirement to comply with legislation on ozone depleting substances and climate gases.

8.7.7.7 Assessment of processes that affected attainment of project results

8.7.7.7.1 Preparation and readiness

2170. Ritols was prepared and ready for the changeover to water-based spray technology. The Latvian government had introduced a tax on imports of ODS in 1997, and it had established import quotas for CFCs, HCFCs and CTC. Ritols was therefore aware that CFCs were becoming more difficult to obtain and their price was increasing at that time. CFC-free technology needed to be adopted in order to allow their spray foam business to continue to operate profitably.

8.7.7.7.2 Country commitment and motivation

2171. Representatives for the Latvian government had met with the Montreal Protocol's Implementation Committee on several occasions to discuss the reasons for Latvia's non-compliance with the ODS phase out schedule, and potential solutions. At the third and last meeting with Latvia in 1998, the Committee remarked that ODS phase out projects were being initiated rather late, and that Latvia had not effectively enforced the CFC ban and the CFC quota restrictions. Further details on these meetings are provided in paragraphs 2124 to 2127 above.

Shortly after this meeting, Latvia approved the phase out project for the use of CFCs in spray technology.

2172. As elimination of the use of CFCs by Ritols can be regarded as a step toward full compliance by Latvia, the delay in enforcing the CFC ban and the delay in enforcing the quota restrictions for CFCs at the time the project was being formulated were assessed in this evaluation as indicative of a lack of commitment and motivation by Latvia toward achieving full compliance with the requirements of the Montreal Protocol.

8.7.7.7.3 Stakeholder involvement

2173. There were relatively few stakeholders involved in this sub-project as the project required only cooperation between Ritols, Intergan (for the spray equipment), UNDP and the MoE. The partnerships formed as a result of this cooperation were assessed as creating an effective stakeholder network to progress the phase out of CFCs in the foam sector.

8.7.7.7.4 Financial planning

2174. There were no reports available by UNDP on financial planning in this sub-project, such as financial controls, reporting and management. Ritols did not report any financial difficulties associated with payments for the equipment or its installation and testing.

8.7.7.7.5 UNEP / UNDP supervision and support

2175. UNDP was the lead agency for the replacement of CFCs with hydrocarbons in the production of aerosols at Ritols. In all the projects that involved provision of equipment, UNDP took responsibility for tendering and procurement of aerosol filler equipment, and for organising its installation. The assessment team assumed UNDP applied the same conditions to the equipment required to convert Ritols to CFC-free technology, as no documents were available that indicated otherwise. On this basis, the evaluation team assessed UNDP supervision and support as satisfactory.

8.7.7.7.6 Co-financing and project outcomes & sustainability

2176. This sub-project included technical advisory services, capital equipment, training in operational safety, contingencies and project support services including monitoring-evaluation. Although there was no co-finance by Ritols, the operational costs of $57,456 paid over a 4-year period by Ritols, which were not claimed as the GEF rules did not support such a claim, could be considered as a form of co-finance.

8.7.7.7.7 Project implementation delays and impact on project outcomes & sustainability

2177. As noted by the Montreal Protocol's Implementation Committee in 1998 in a meeting with Latvia, the Committee noted that Latvia had delayed enforcing the CFC ban and the quota restrictions for CFCs, and that ODS phase out projects in Latvia were being initiated rather late.

2178. Despite the delay in initiating the project, the delay was assessed as not having a major impact on sustainability. As a result of the replacement of the CFCs with better water-based technology, Ritols was able to continue to operate their business after the phase out of CFCs. Conversely, without the change to new technology, Ritols would have gone bankrupt as the CFCs would not have been available for their operations.

8.7.7.8 Sub-Project Rating

LAT/97/G33 Phase out of the use of CFCs in the manufacture of rigid polyurethane foam at Ritols (UNDP/UNOPS)		
Criterion	**Evaluator's Summary Comments**	**Evaluator's Rating**
Attainment of project objectives and results Sub criteria (in yellow below)	See comments below	S

LAT/97/G33 Phase out of the use of CFCs in the manufacture of rigid polyurethane foam at Ritols (UNDP/UNOPS)		
Criterion	**Evaluator's Summary Comments**	**Evaluator's Rating**
Effectiveness	The facility was converted to water-based technology thereby avoiding further CFC consumption	HS
Relevance	Conversion to non-ODS technology is consistent with minimising the detrimental effect of ODS on the ozone layer, climate warming by ODS, and assisted with harmonisation of Latvian and EU legislation prior to accession in May 2004	HS
Efficiency	The conversion to water-based technology in Latvia ($10.91 per ODP-kg) was about 45% more expensive than the average cost ($7.53 per ODP-kg) of the conversion to CFC-free technology in rigid foam projects financed in developing countries by the MLF	S
Sustainability of Project outcomes (overall rating) Sub criteria (in yellow below)	See comments below	S
Financial	The conversion from CFCS to water-based technology resulted in a financially sustainable business	S
Socio-Political	Low social and political risks that influenced the operations of Ritols, resulting in good prospects for sustainability	S
Institutional framework and governance	Supportive and likely to promote the sustainability of Ritols operations	S
Environmental	No environmental risks potentially threatening to the continuation of the Ritols' operations	HS
Achievement of outputs and activities		S
Monitoring and Evaluation (overall rating) Sub criteria (in yellow below)	See below	
M&E Design	Design was not evident in any of the project documents; likely that Ritols assumed this UNDP role	U
M&E Plan Implementation (use for adaptive management)	No implementation of the M&E plan; likely that Ritols assumed this UNDP role	U
Budgeting and Funding for M&E activities	Not defined within the overall budget for the sub-project	U

LAT/97/G33 Phase out of the use of CFCs in the manufacture of rigid polyurethane foam at Ritols (UNDP/UNOPS)		
Criterion	**Evaluator's Summary Comments**	**Evaluator's Rating**
Catalytic Role	No categorisation required	
Preparation and readiness	Ritols was prepared and ready for the changeover to water-based spray technology; very short time for conversion	HS
Country commitment and motivation*	Latvia delayed enforcing the CFC ban and the CFC quota restrictions, which was evidence of lack of commitment and motivation by Latvia	US
Stakeholders' involvement	The partnerships formed as a result of this cooperation were assessed as creating an effective stakeholder network to progress the phase out of CFCs in the foam sector	S
Financial planning	No financial difficulties reported	S
UNEP supervision and support**	UNDP undertook procurement and delivery, but no other follow up	S
Overall Rating		S

Highly Satisfactory (HS); Satisfactory (S); Moderately Satisfactory (MS); Moderately Unsatisfactory (MU); Unsatisfactory (U); Highly Unsatisfactory (HU);
*Motivation replaced TOR '*driveness*'; **Support replaced TOR 'backshopping'

8.7.8 Projects on methyl bromide

2179. The GEF initially funded a UNEP Project entitled "*Initiating early phase out of methyl bromide in CEITs through awareness raising, policy development and demonstration/training activities*". This was a Medium-Sized Project (MSP) that was designed to assist seven CEITs to reduce their use of methyl bromide[328]. The Project commenced in March 2000 and concluded in September 2002. The total budget was $806,195 consisting of $700,000 from GEF, $37,000 in kind from the government, and $106,195 from Canada.

2180. The Project "*Initiating early phase out of methyl bromide in CEITs through awareness raising, policy development and demonstration/training activities*" consisted mainly of awareness raising activities on the uses of methyl bromide and its alternatives, policy development for methyl bromide phase out, identification of alternatives, diffusion of demonstration results, adoption of alternatives, and implementation of national programmes.

2181. Workshops were held in Hungary (23-25 April 2001, soil uses) and Bulgaria (28-30 May 2002, postharvest uses). These workshops concluded, *inter alia*, that further investment was needed to implement methyl bromide alternatives for to control pests in soil and durable commodities, and possibly for structural fumigation. The workshops also identified a need for non-investment activity such as training in the implementation of policies and measures to limit the use of methyl bromide and to expand the use of alternatives, to support and sustain training on the use, and the development of, alternative techniques.

2182. The usefulness of this initial project was assessed in a survey to all countries that participated in the project. Latvia did not respond to the survey as in 2003 the NOU had not been established[329]. However, this project laid the foundation for further work in Latvia by

[328] GF/4040-00-10 for CEITs Bulgaria, Estonia, Hungary, Latvia, Lithuania, Poland and Slovakia

[329] Ausher, R. 2003. Evaluation of the project on initiating the early phase-out of methyl bromide in countries with economies in transition through awareness-raising, policy development and demonstration and training activities. GF/4040-00-10. UNEP Evaluation and Oversight Unit. 42pp. Page 4.

UNDP/UNEP in a project entitled "*Total Sector Methyl Bromide Phase Out in Countries with Economies in Transition*", which aimed to complete the phase out of Non-QPS uses of methyl bromide in six countries. The results of this Project are evaluated in this Evaluation Report.

8.7.9 GF/4040-05-05 "Total Sector Methyl Bromide Phase Out in Countries with Economies in Transition"

8.7.9.1 Introduction

2183. The GEF also funded the UNDP/UNEP "*Total sector methyl bromide phase out in countries with economies in transition*" was designed to assist five[330] CEITs to phase out all uses of methyl bromide except quarantine and pre-shipment by 1 January 2005, in accordance with the text of the Copenhagen Amendment of the Montreal Protocol that was relevant to developed countries.

2184. The UNEP budget for the non-investment activities in the regional project was $4,203,754 including $130,500 for project development, $2,151,325 from the GEF and $1,921,929 of in-kind co-finance[331]. The UNDP budget for the investment activities in the regional project was $3,267,075 including $45,000 for project development, $2,848,675 from the GEF and expected in-kind contributions of $373,400[332]. The total budget for the project was therefore $7,470,829. The regional methyl bromide phase out project was scheduled to commence in May (UNEP) or December (UNDP) 2004 and to conclude in May 2006 (UNEP) or November 2007 (UNDP).

2185. The Project was approved by the GEF on 1 May 2004. It officially commenced in Latvia on 21 September 2006, and it was completed in October 2008. Latvia aimed to phase out 8.83 ODP-tonnes per year of non-QPS uses of methyl bromide in the postharvest sector. The GEF provided $255,434 in financial assistance for phosphine fumigation equipment[333], for the procurement of Integrated Pest Management (IPM) equipment[334], and $32,000 for study tours, training on phosphine fumigation, other alternatives and IPM procedures.

2186. Latvia imported on average 4.2 ODP-tonnes of methyl bromide per year from 1996 to 2003. Latvia did not import in four of those years, which resulted in zero consumption reported for some years to the Ozone Secretariat[335], although methyl bromide was probably still applied.

2187. Latvia was approved a Critical Use Exemption of 2.502 tonnes by the Parties to the Montreal Protocol in 2005 that could be used from 1 January 2006. However, the European Commission did not licence the use of any methyl bromide for critical uses by Latvia in 2006, despite the approval of the Parties, as the Commission believed that an alternative to methyl bromide was available. Decision IX/6 of the Montreal Protocol, which guided the Commission in its decision, required Parties to ensure that methyl bromide was only licensed when an alternative was not available or could not be used. The Commission believed that alternatives were available and could be used.

2188. As Latvia reported zero consumption of methyl bromide in 2002 and 2003, and was not permitted to consume methyl bromide in 2006[336], the project funding in Latvia was most likely used to sustain the phase out of the non-QPS uses methyl bromide, rather than to phase out methyl bromide.

8.7.9.2 Attainment of objectives and planned results

8.7.9.2.1 Effectiveness

2189. The project that aimed to phase out methyl bromide regionally through a combination of

---

330 GF/4040-05-05 for CEITS Bulgaria, Estonia, Hungary, Latvia, Lithuania and Poland. Azerbaijan and Uzbekistan were observers. Estonia did not consume methyl bromide

331 UNEP. 2008. UNEP GEF PIR FY 2008 Review 1. For the period 1 July 2007 to 30 June 2008. 50 pp

332 UNDP. 2003. Total Sector Methyl Bromide Phase Out in Countries with Economies in Transition. GEF – UNDP Project Document. 29 pp.

333 Materials and equipment for sealing silos, recirculation system for silos, blowers for aeration, safety equipment, phosphine detectors and measure equipment

334 Industrial vacuum cleaners, insect and rodent monitoring kits (floor traps, pheromone traps); and heat treatment materials such as ThermoNox mobile heating units, electrical distribution system, infrared heat measurement gun, ventilators-blowers

335 Consumption of MB was 15 ODP-tonnes/1996; 0/1997; 9/1998; 0/1999; 0.5/2000; 8.8/2001; and zero from 2002

336 The European Commission reported methyl bromide consumption to the Montreal Protocol on behalf of all Member States in the EU that were still using methyl bromide, including the years 2004 and 2005. It was therefore not possible to determine from the EC report whether Latvia consumed methyl bromide in those years or not.

awareness raising activities, policy development assistance, training on alternatives and investment activities, and data collection activities to measure the impact of the project. According to UNEP[337], this included the following performance indicators:

- Provision of methyl bromide publications and materials (with provisions for translation into local languages) to support *awareness-raising* activities;
- Training workshops or modules on *policy development* for the control of methyl bromide (bringing together policy makers, Customs officers, importers, users, producers);
- *Training courses/workshops* to educate stakeholders on alternatives and to develop training strategies for local extension workers on promoting and implementing alternatives;
- *Investment activity* to implement suitable methyl bromide alternatives for control of pests in soil (pre-harvest) and durable commodities (post-harvest); and
- The phase out of non-QPS methyl bromide consumption[338].

2190. The achievement of outputs and activities by Latvia, as measured against these performance indicators, are provided in Section 8.7.4.5.1 "*Delivered outputs*" on page 388.

8.7.9.2.2 Relevance

8.7.9.2.2.1 Continued reduction of methyl bromide

2191. The five countries that had reported consumption of methyl bromide, and that were participants in the project "*Initiating early phase out of methyl bromide in CEITs through awareness raising, policy development and demonstration/training activities*", were reported to have reduced their combined consumption of methyl bromide from 120.42 ODP-tonnes at the start of the project to 86.16 ODP-tonnes in 2000.

2192. However, consumption reported in 2001 indicated that for some countries investment assistance was urgently needed to fully phase out methyl bromide. Bulgaria, the Czech Republic, Estonia, Hungary, Latvia, Lithuania, Poland, and Slovakia were the original participants in the project, with Bulgaria, Hungary, Latvia, Lithuania and Poland being responsible for the main consumption in the region. In 2001, three countries (Bulgaria, Latvia and Poland) showed signs of a return to increased methyl bromide consumption. The governments of these countries maintained that without further assistance they would be unable to completely phase out methyl bromide.

2193. In the case of Latvia, the concerns of these countries were justified. Latvia reported no consumption in 2002 and 2003, but was authorised 2.502 tonnes of methyl bromide for critical uses in 2006. Therefore the project was relevant for preventing an increase in methyl bromide and relevant for ending methyl bromide uses altogether.

8.7.9.2.2.2 Avoidance of methyl bromide critical use requests

2194. Regulation (EC) No 2037/2000 on *Substances that Deplete the Ozone Layer* had more stringent criteria for determining 'critical use' exemptions than criteria contained in the Montreal Protocol[339]. In 2005, the EU licensed only modest critical use exemptions that were much less than those approved by the Montreal Protocol, in accordance with the criteria contained in Decision IX/6 of the Montreal Protocol.

2195. The project was relevant as it assisted the countries participating in the project to deploy alternatives as fast as possible in order to avoid the need for 'critical uses' of methyl bromide. The short time frame for the project required the transfer of proven methyl bromide alternatives from other regions with similar climates and conditions, and to adapt them to local conditions.

8.7.9.2.2.3 Compliance with market standards

2196. Farmers in Europe at the time were experiencing market pressures to reduce the environmental

---

[337] UNEP. 2003. GEF PDF Block B Request: *Total Sector MB Phase Out in Countries with Economies in Transition*. Page 9. UNEP-DTIE internal publication. 41 pages.

[338] Included by the evaluators in this report as this was implied but not stated by UNEP.

[339] Regulation (EC) No 2037/2000. Article 3 (2)(iii).

impact of their farming practices. European supermarket chains had established a code of practice for agricultural production for fruit and vegetables, called EurepGAP. EurepGAP is a private sector body that sets voluntary standards for the certification of agricultural products globally. These standards were developed in response to consumer concerns about food production standards, pesticides and environmental pollution from agriculture.

2197. Increasingly at that time and even today, the European supermarket chains were requiring farmers/suppliers to comply with these strict standards, if they wished to continue supplying the supermarkets in the future. The standards required suppliers/farmers to justify in writing the use of methyl bromide and other fumigants, and strongly promoted integrated pest management (IPM) and non-chemical methods of controlling pests and diseases.

2198. The project was relevant because it helped to build capacity for the longer-term development of non-chemical alternatives that are suitable for the markets and circumstances in which they operate.

8.7.9.2.2.4 Recommendations for reducing methyl bromide use

2199. The GEF[340] stated that "*…In order to achieve compliance with the Montreal Protocol, a full phase out of all reported (non-QPS) consumption (and production) needs to be achieved by the end of 2004 … consumption needs to be reduced from the current levels … to zero in 2005*". Because methyl bromide was still being consumed in Latvia in 2001 just prior to when the project was being formulated[341], Latvia was eligible for assistance to completely phase out methyl bromide.

2200. The Workshop on Methyl Bromide Alternatives for Soil Uses (April 2001, Hungary) concluded in part that the deployment of alternatives *"…may need extra financial investment, (with the further) support of the GEF, particularly where the establishment of soil-less production, registration of new biological agents or pesticides, or higher application costs of physical and cultivation costs are involved".* Although Latvia focused only on post-harvest uses, the areas where financial investment was needed to solve pest problems in this sector was still relevant.

2201. A similar conclusion was reached by working groups at the subsequent meeting in Bulgaria for training in post-harvest alternatives (May, 2002), where participants concluded in part that *"…Alternatives are present, but assistance is required for technology transfer and adaptation to the specific conditions, and to produce new alternatives as the existing ones are not always suitable to replace methyl bromide (under the conditions experienced in the CEITs of the Eastern European region)…".*

2202. The reduction and phase out of methyl bromide in Latvia is also consistent with the objectives of the Vienna Convention and the Montreal Protocol, which *requires Parties to take appropriate measures in accordance with the provisions of this Convention and of those Protocols in force to which they are party to protect human health and the environment against adverse effects resulting or likely to result from human activities which modify or are likely to modify the ozone layer*[342].

2203. The GEF established in 1995 an Ozone Layer Depletion Focal Area in response to the Montreal Protocol. The Focal Area has the strategic objective of protecting human health and the environment by assisting countries to phase out their consumption and production of ODS, to prevent emissions of ODS, and to encourage the uptake of alternative technologies and practices according to a country's commitments under the Montreal Protocol. The financial interventions in the GEF Focal Area contribute to the return of the ozone layer to pre-1980 ozone levels, which is expected by 2065.

2204. The reduction and phase out of methyl bromide was a requirement for developed countries such as Latvia that had ratified the Copenhagen Amendment in the Montreal Protocol. In addition, the reduction and phase out of methyl bromide was required by 31 December 2004 which was shortly after Latvia's accession to the EU on 1 May 2004. The sustained phased out of methyl bromide was therefore relevant for avoiding non-compliance with EU legislation on methyl

---

[340] GEF. 2003. GEF Support to Countries with Economies in Transition in Phasing Out of Annex C1 and E Substances of the Montreal Protocol GEF/C.18/Inf.6, page A4

[341] Ozone Secretariat Data Centre. 2009. Latvia reported to the Parties of the Montreal Protocol a consumption of 8.8 ODP-tonnes of methyl bromide in 2001.

[342] Handbook for the Vienna Convention for the Protection of the Ozone Layer - 7th Edition (2006). Article 2: General Obligations.

bromide that applied shortly after accession.

2205. The actions taken by Latvia to phase out methyl bromide were therefore relevant to continuing the reductions in methyl bromide use that had been achieved in previous projects, compliance with market standards by implementing production practices that minimised the use of chemicals in the food chain, recommendations for reducing methyl bromide use, compliance with Montreal Protocol, and sustainability of the compliance with EU regulations after accession to the EU.

8.7.9.2.3 Efficiency

2206. The cost-effectiveness as a means of determining '*efficiency*' was not relevant to the Institutional Strengthening component of this project (such as advice on the development of policies and measures), as Institutional Strengthening is not normally subject to cost-effectiveness criteria. The GEF/UNEP-UNDP non-investment in this regional project was $4,203,754.

2207. Latvia aimed to phase out 8.83 ODP-tonnes per year of methyl bromide in the postharvest sector. The GEF provided $255,434 in financial assistance for phosphine fumigation equipment[343], for the procurement of Integrated Pest Management (IPM) equipment[344], and $32,000 for study tours, training on phosphine fumigation, other alternatives and IPM procedures. The total provided by the GEF was therefore $287,434.

2208. In 2001 which was the last year of methyl bromide consumption reported by Latvia and 5 years before the project commenced on September 2006, Latvia reported a methyl bromide consumption of 8.8 ODP-tonnes[345]. This consumption was also used by UNEP as the baseline quantity of methyl bromide to be phased out. Based on the GEF funding of $287,434 the cost-effectiveness of the project for sustaining the phase out of the methyl bromide was therefore $32.66 per ODP-kg.

2209. In 2006, and noting that the project commenced in Latvia in September that year, Latvia was approved a Critical Use Exemption of 2.502 tonnes for the use of methyl bromide for the fumigation of grain silos[346]. This is equivalent to 1.75 ODP-tonnes. Based on the GEF funding of $287,434 the cost-effectiveness phasing out methyl bromide would have been $164.25 per ODP-kg, if Latvia had been permitted to consume methyl bromide. As described above, Latvia was denied the use of methyl bromide by the European Commission as alternatives were believed to be available, and therefore methyl bromide was not consumed in 2006.

2210. UNDP estimated the cost-effectiveness to the GEF to be about $50 per ODP-kg for the investment component of the regional project, based on the phase out of about 100.2 ODP-tonnes of methyl bromide annually in the region of the participating countries[347].

2211. The cost-effectiveness reported by the MLF for the phase out of methyl bromide in 31 Developing Countries prior to 2003 ranged from $0.04 to $85.18 per ODP-kg, the price depending mainly on the size of the project and its location[348]. The average cost-effectiveness in 24 completed projects that were assessed by the MLF was $23.55 per ODP-kg of methyl bromide.

2212. The cost-effectiveness of $32.66 per ODP-kg based on the reported phase out of methyl bromide in Latvia was 39% more than the average cost-effectiveness of $23.54 ODP-kg per year of MLF-financed methyl bromide phase out projects described above. The cost-effectiveness of the methyl bromide phase out project in Latvia was therefore assessed as relatively expensive, compared with similar projects undertaken in developing countries.

---

[343] Materials and equipment for sealing silos, recirculation system for silos, blowers for aeration, safety equipment, phosphine detectors and measure equipment

[344] Industrial vacuum cleaners, insect and rodent monitoring kits (floor traps, pheromone traps); and heat treatment materials such as ThermoNox mobile heating units, electrical distribution system, infrared heat measurement gun, ventilators-blowers

[345] Ozone Secretariat Data Centre, 13 May 2009

[346] TEAP. 2009. Critical Use Nominations for Methyl Bromide. Annex IV. Part A: Trend in Pre-Plant Soil Applications. Part B: Trends in Post-harvest Structural and Commodity Applications. Period 2005 to 2010. Information supplied by the Ozone Secretariat to MBTOC. Pages 79-83.

[347] UNDP. 2003. Total Sector Methyl Bromide Phase Out in Countries with Economies in Transition. GEF – UNDP Project Document. 29 pp. Page 27.

[348] MLF. 2004. Desk Study on Methyl Bromide Projects. UNEP/OzL.Pro/ExCom/43/8. Annex V, pages 36-37.

8.7.9.3 Assessment of sustainability of project outcomes

8.7.9.3.1 Financial resources

2213. The Ministry of Environment (MoE) has financed a National Ozone Unit (NOU) in Latvia since September 2004[349]. Since that time, the MoE has been the competent authority responsible for ozone layer protection in Latvia.

2214. Several organisations in Latvia were financed by the government to undertake activities related to the phase out ozone-depleting substances, including methyl bromide:

- MoE for drafting and enforcing legislation on ozone layer protection;
- Latvian Environment, Geology and Meteorology Agency (LEGMA) for statistics on quantity of ODS used and purposes;
- State Plant Protection Service (SPPS, methyl bromide use and emissions);
- State Revenue Service – Customs Department (import and export of ODS to non-EU countries); and
- State Environmental Service (SES, Inspectorate that visits companies to determine the use and emissions of ODS).

2215. The government also financed the NOU which has a staff of 1.5 FTE[350]. The government also contracted assistance from local experts, according to the budget and sub-project. In 2009, the NOU allocated 0.25 FTE to ozone-depleting substance issues. As in other Ministries and departments, the MoE has had to reduce staff in response to the economic crisis[351]. However, the NOU has put in place legislation that empowered other services (such as Customs officers and the SES inspectors) to undertake independent work on ODS. The results of their work were reported to the NOU which, in effect, obviated the need for a large NOU.

2216. After 1 May 2004 when Latvia acceded to the EU, as a new Member State Latvia had access to funds to progress Latvia's political and economic transition in areas that included transport, local development, energy, environment and finance. In addition, Latvia had access to the EU's Cohesion Fund which is a structural instrument that helps Member States to reduce economic and social disparities and to stabilise their economies. The Cohesion Fund made available to all Member States €15.9 billion (in 2004 prices) in 2004-2006, but more than half of the funding (EUR 8.49 billion) was reserved for activities in Member States that most recently joined the EU such as Latvia.

2217. For these reasons, the prospects for continuing finance by the government of Latvia on activities relating to the reduction and phase out of ozone-depleting substances were assessed as likely, but they are likely to be carried out at a relatively modest level given the poor economic conditions prevailing in the country due to the global economic crisis.

8.7.9.3.2 Socio-political

2218. The major use of the methyl bromide in Latvia was for the disinfestation of flour mills and silos. The methyl bromide phase out project was coordinated initially by the Latvian Environment, Geology and Meteorology Agency who took responsibility for its implementation, prior to the MoE assuming responsibility. The National Ozone Unit (NOU) within the Ministry of Environment (MoE) was the Executing Agency. MoE sub-contracted the Baltic Environmental Forum (BEF) to provide technical assistance in April/May 2007.

2219. MoE and BEF also cooperated with State Plant Protection Service, the Ministry of Agriculture and the State Health Agency. The State Plant Protection Service has a general mandate for maintaining national plant health and plays major role in the agrochemical registration process, education, training and supervision. The State Plant Protection Service had a Fumigation Division until 2004, which used about 800 kg of methyl bromide per year for commercial QPS fumigations in Latvia.

2220. The government of Latvia has put in place the structure that it believed was able to be

---

[349] Decree 233 of 1 April 2004: Ozone Layer Protection Regulations

[350] Full-Time-Equivalent.

[351] Financial Times 12 May 2009 "Latvian economy slides by 18%". In general, Latvia's financial performance in 2009 is likely to be the worst among the 27 Member States, as GDP reduced by 18% in 2009 (compared to a 10% increase in 2008).

responsive to the work on ozone layer protection. The government has implemented a multi-stakeholder approach that involves different services, administrations and ministries to undertake activities on monitoring and reporting ODS use. The requirements of the stakeholders are supported by legislation. In this way, the NOU itself can remain relative small with a strategic role, knowing that other stakeholders are involved in ozone layer protection.

8.7.9.3.3 Institutional framework and governance

2221. The institutional framework in Latvia consisted of the Ministry of Environment that was responsible for drafting and enforcing legislation on ozone layer protection; the Latvian Environment, Geology and Meteorology Agency that was responsible for statistics on quantity of ozone-depleting substances used and purposes; the State Plant Protection Service that has a general mandate for maintaining national plant health and plays major role in the agrochemical registration process, education, training and supervision; the State Revenue Service – Customs Department that was responsible for monitoring and reporting on the import and export of ozone-depleting substances to non-EU countries; and the State Environmental Service that has an Inspectorate that is responsible for visits to companies to determine the use and emissions of ozone-depleting substances.

2222. Relevant legislation implemented in Latvia at the time of the Project included an ODS licensing system; a tax on imports of ODS in 1997; import quotas for CFCs, HCFCs and CTC; provisions for qualifications and certification of personnel that work with refrigerants; provisions to recovery and recycle ODS; a ban on halon imports effective 1 January 1997; and a voluntary freeze by importers and users on ODS consumption. Subsequently, Latvia banned CFC imports on 1 January 2001.

2223. A 2002 regulation on ODS was implemented in Latvia to harmonise as much as possible Latvian legislation on ODS with Regulation (EC) No 2037/2000 before Latvia joined the EU on 1 May 2004. A new regulation[352] on ODS and fluorinated gases came into force on 1 January 2006 to fully implement the requirements of EU legislation, which replaced all previous versions on ODS legislation.

2224. The range of government organisations involved in Latvia, and the legislation that was in place, was assessed as sufficient to promote the sustainability of the methyl bromide phase out because these government organisations were staffed by personnel that had built up experience in activities related to the reduction and phase out of methyl bromide, including training in best-practice management of alternatives to methyl bromide. The legislation was considered important for sustaining the phase out, which is discussed further in Section 8.7.9.3.4.

8.7.9.3.4 Environmental

2225. The main driver affecting the use of methyl bromide in Hungary was national and EU legislation that existed at the time of the project that restricted the use of methyl bromide and that required activities by users and Member State competent authorities. The EU legislation has since been superseded by revised legislation that has eliminated the use of methyl bromide altogether.

2226. The environmental legislation that was in force in the EU at the time of the project and until 31 December 2009, and relevant for postharvest uses, was Regulation (EC) 2037/2000. This legislation required Member States:

- To phase out the placing on the market of non-QPS uses of methyl bromide by 31 December 2004;
- To put in place all precautionary measures practicable to prevent and minimise leakages of methyl bromide from fumigation installations and operations in which methyl bromide is used;
- To define the minimum qualification requirements for the personnel involved in methyl bromide fumigation;
- To require producers, importers and exporters of methyl bromide to report to the

[352] Decree 688 "Regulations on Ozone Layer Depleting Substances and Fluoride Greenhouse Effect Gases, which are Refrigerating Mediums", adopted 6 September 2005.

European Commission on the quantities of ODS produced, imported and exported annually; and

- To submit annual reports on the use of methyl bromide and its alternatives, critical uses of halons, the use of CFCs in medical products that control asthma, the phase out of halon on ships and in aircraft, and the quantity of ozone-depleting substances recovered, reclaimed, recycled and destroyed.

2227. A 2002 Latvian regulation on ozone-depleting substances that was implemented to harmonise as much as possible Latvian legislation on ozone-depleting substances with Regulation (EC) No 2037/2000 before Latvia joined the EU on 1 May 2004. This regulation that limited the availability of ozone-depleting substances including methyl bromide also had the secondary important effect of encouraging the development of ODS-free alternatives as a way of controlling pests without the restrictions inherent in the ozone-depleting substances. The EU legislation included the provision for the Commission to agree or not to license ozone-depleting substances for particular uses, which was the case with Latvia's request for critical uses which was approved by the Parties to the Montreal Protocol but it was declined to be licensed for use in Latvia by the Commission.

2228. New legislation on ODS came into force on 1 January 2010. Regulation (EC) No 1005/2009 replaced Regulation (EC) 2037/2000. Methyl bromide did not meet the safety criteria and was de-registered in the Biocides Directive[353] (non-plant pesticide) from 1 September 2006, and in the Pesticides Directive[354] (Plant Protection Product, PPPD) from 18 March 2009.

2229. Regulation (EC) No 1005/2009 allows MB-QPS stocks[355] to be used until 18 March 2010, but limits the quantity to 45 ODP-tonnes from 1 January to 18 March 2010, and none from this date onwards. Up until 18 March, methyl bromide can only be used for QPS at government-approved fumigation sites and only if degassing equipment is in place to recover 80% of the methyl bromide used in the fumigation. Methyl bromide may be used for Emergency Uses[356] for controlling unexpected pest outbreaks, but only if it is first authorised by the European Commission and providing methyl bromide is permitted under the Biocides and Pesticides Directives. Currently, methyl bromide is not permitted in these Directives and *ipso facto* it cannot be used for QPS. Therefore, all uses of methyl bromide including those for QPS are banned in the EU including Latvia from 19 March 2010. A total ban of methyl bromide will prevent QPS uses being used off-target for non-QPS uses.

2230. The main environmental risk that could undermine the implementation of the alternatives in Latvia is illegal imports of methyl bromide. However, this seems unlikely since about 40 State Environmental Service Inspectors were trained in May 2006 in Latvia in two workshops on ODS legislation and methods to identify ozone-depleting substances. In December 2006, more than 40 Customs Officers were trained on the different types of ozone-depleting substances and equipment packaging and hazardous chemicals. They were provided with a fact sheet for identifying ozone-depleting substances, a brochure on ozone-depleting substances and its alternatives, and relevant information on ozone-depleting substances legislation. The training for Customs Officers was financed with funds from the Institutional Strengthening sub-project.

2231. In addition to the inspection and monitoring procedures that have been implemented for ozone-depleting substances including methyl bromide, the previous and current regulation on ozone-depleting substances has in place a requirement for Member States to put in place *effective, proportionate and dissuasive* penalties for illegal import of ozone-depleting substances or illegal use of ozone-depleting substances.

2232. The risk of methyl bromide import and use re-establishing in Latvia was assessed as low, because of the national and EU legislation, as well as Custom's ODS surveillance procedures and reporting that were in place to detect and confiscate any imports of methyl bromide which would be illegal.

---

[353] Regulation (EC) 2032/2003
[354] Decision 2008/753/EC
[355] Articles 12 (1) (2) in Regulation (EC) No 1005/2009 on ODS
[356] Articles 12 (3) in Regulation (EC) No 1005/2009 on ODS

8.7.9.4 Catalytic role

2233. The key factors influencing catalytic action are *innovation, demonstration, replication* and *co-operation*. In this methyl bromide sub-project, the two factors that influenced catalytic action were *replication* and *co-operation*.

2234. The Project Coordination Unit was responsible for encouraging a '*bottom to top*' training process. This increased the capacity of stakeholders to sustain the phase out and to take operational decisions that were both effective and economically viable. The planned activities and the use of cooperative methods of delivery laid the foundation for a supportive framework that implemented the alternative technologies.

2235. As a result of the project, UNEP organised the participation of experts from the World Bank and the MLF to promote the *replication* of the training activities developed in this regional project. The training manuals were translated (into Russian), for broader use in the Eastern Europe and Central Asian region, at the cost of the MLF funds of the ECA network.

2236. Bulgaria produced a Manual[357] for soil sector specialists (primarily future trainers and facilitators of Farm Field Schools) on practical ways to implement alternatives to methyl bromide. This was translated from Bulgarian into English by FAO so that it could be used to cooperate with soil specialists in other countries. Hungarian experts produced a chapter in the Manual entitled "*Cultivation in Hungary without Methyl Bromide*", which described the use of methyl bromide in the past and its replacement today with chemical and non-chemical alternatives. UNEP planned to use the training Manual and other materials developed under this project as a useful resource in the OzonAction Clearinghouse programme, so that a wider audience could benefit from the experiences in the CEIT countries in the implementation of alternatives to methyl bromide.

2237. The World Bank officer responsible for the Ukraine methyl bromide project, as well as the Regional Ozone Network for Europe and Central Asia, were kept informed of the results of this project because of its potential to help with the phase out of methyl bromide in other countries.

2238. For these reasons, this methyl bromide regional phase out project was assessed as having a useful catalytic role.

8.7.9.5 Achievement of outputs and activities

8.7.9.5.1 Delivered outputs

2239. Paragraph 2189 above showed the basis for selecting the following achievement or performance indicators:

- Provision of methyl bromide publications and materials (with provisions for translation into local languages) to support *awareness-raising* activities;
- Training workshops or modules on *policy development* for the control of methyl bromide (bringing together policy makers, Customs officers, importers, users, producers)
- *Training courses/workshops* to educate stakeholders on alternatives and to develop training strategies for local extension workers on promoting and implementing alternatives;
- *Investment activity* to implement suitable methyl bromide alternatives for control of pests in soil (pre-harvest) and durable commodities (post-harvest); and
- The phase out of non-QPS methyl bromide consumption.

2240. The delivered outputs are discussed for each of them below.

8.7.9.5.1.1 Awareness raising

2241. The GEF/UNEP Project[358] "*Initiating early phase out of methyl bromide in CEITs through awareness raising, policy development and demonstration/training activities*" assisted Latvia to sustain its phase out of methyl bromide.

---

[357] FAO and UNEP. 2008. Manual: Alternatives to replace methyl bromide for soil-borne pest control in East and Central Europe. Edited by R. Labrada. FAO. 102 pp.

[358] GF/4040-00-10. Prof Reuben Ausher Review reported in October 2003.

2242. The project consisted mainly of awareness raising activities on the uses of methyl bromide and its alternatives, policy development for methyl bromide phase out, identification of alternatives, diffusion of demonstration results, adoption of alternatives, and implementation of national programmes. Workshops were held in Hungary (23-25 April 2001, soil uses) and Bulgaria (28-30 May 2002, postharvest uses). This specific awareness raising work on methyl bromide was part of a broader awareness raising programme in Hungary on the need to phase out ozone-depleting substances generally.

2243. Training courses were held on alternatives to methyl bromide which helped to raise the awareness of alternatives to methyl bromide. These are described in Section 8.7.9.5.1.3 *Training on alternatives to methyl bromide* below.

2244. The awareness raising activities on methyl bromide alternatives were part of a larger programme on awareness raising on ozone-depleting substances in general that was undertaken by the NOU in Latvia. An extensive campaign of Awareness Raising over a 12 month period, beginning in December 2005, was undertaken by the NOU to educate Latvian school children on the value of protecting the ozone layer called "*Protect and be Protected*".

2245. The NOU worked with 5 experts/teachers across different disciplines. These initiatives included: 37 press releases; Information on ODS regulations provided to NGOs, state authorities and private companies; Publishing and regularly updating a webpage; Development of portable experiments; Video on ozone layer protection; Launch of campaign "Ozone Layer Friendly School" with competitions; Production of 1,500 "3mm"[359] posters and 600 maps; Development of teaching aids for multi-level education; Two publications; Five regional training workshops for teachers of primary school as well as teachers of chemistry, biology, geography and physics; Manufacture of special souvenirs, prizes and certificates (sponsored as much as possible); Production of a Latvian version of the Ozzy Ozone video; and a Closing Ceremony with 142 Ozone Layer Friendly Schools.

2246. Awareness raising in this project on alternatives to methyl bromide in Latvia was assessed as having been delivered.

8.7.9.5.1.2 Policy development

2247. Latvia harmonised its national legislation in 2002 with the legislation of the EU on ozone-depleting substances, which was about two years in advance of its accession to the EU on 1 May 2004. In addition, dissuasive penalties were implemented for violators of the legislation on ozone-depleting substances.

2248. The Latvian government has implemented legislation that mandates various government services, administrations and ministries to undertake activities on monitoring and reporting ODS use. The requirements of the stakeholders are supported by legislation. In this way, the NOU itself can remain relative small with a strategic role, on the basis that other stakeholders also contribute to activities on ozone layer protection.

2249. The development of the policies and the implementation of the legislation in Latvia, were assessed as having been delivered.

8.7.9.5.1.3 Training courses and workshops

2250. Based on the workshops and courses that were provided to Customs officers and State Environment Service Inspectors, the evaluation team assessed that training in the detection of illegal trade in ozone-depleting substances had been delivered.

2251. Based on the workshops and courses that were provided to mill owners in Latvia, the evaluation team assessed that training on methyl bromide alternatives had been delivered.

8.7.9.5.1.3.1 Customs training

2252. In May 2006, about 40 State Environment Service Inspectors were informed in two workshops by the NOU of legislation on ozone-depleting substances and methods to identify ozone-depleting substances. In December 2006, more than 40 Customs Officers were trained on the different types of ozone-depleting substances, equipment packaging and hazardous chemicals. They were

[359] The thickness of the ozone layer

provided with a fact sheet for identifying ozone-depleting substances, a brochure on ozone-depleting substances and their alternatives, and relevant information on ozone-depleting substance legislation. The training for Customs Officers was financed with funds from the Institutional Strengthening sub-project.

8.7.9.5.1.3.2 Training on alternatives to methyl bromide

2253. Fumigator training courses were delivered annually during the winter by State Plant Protection Service over the course of a week, consisting of theory and practical exercises. State Plant Protection Service certified technicians that passed the course. A 1-week training and technology transfer course was delivered by a service contracted to UNEP on 7-11 May 2007. The information provided in Latvian in the course included a Training Manual, and PowerPoint presentations: Heat treatment; PH_3 fumigation, re-circulation system, and pest resistance management; Rodent control; IPM, chemical and non-chemical methods of insect control; Alternatives used elsewhere; and Safety procedures and equipment.

8.7.9.5.1.4 Investment activity

2254. SJC Dobeles, as the largest grain processing company in Latvia, produces flour, grits, pearl barley, bran and pet food for the wholesale and retail trade. In June 2008, Dobeles was purchased by Tartu Veski which belongs to the Estonian enterprise Tiigi Keskus, which is also the owner of German company Saalemuhle Alsleben that operates some of the most modern mills in Europe. Dobeles successfully replaced methyl bromide with phosphine (PH_3) to kill pests in grain silos and in the mill.

2255. Labibas Sargs employs more than 50 staff employees including licensed fumigators, and is the only company[360] in Latvia that used methyl bromide to a large extent for the treatment of grain in silos/elevators. Labibas Sargs customers are 4 large and 2 small mills, a chocolate factory and some food and feed factories. The company undertakes grain handling procedures such as cleaning and drying of grain, quality checks, grain storage, and supervises the loading and unloading of large vessels.

2256. Labibas Sargs first started fumigation of stored grain in silos with phosphine in 1986. The first mill was fumigated in Latvia in 1989. However, the MoE advised that the use of PH_3 was banned by the Russian authorities at that time, which initiated more widespread use of methyl bromide for silo and elevator fumigation.

2257. State Plant Protection Service said that the last fumigation with methyl bromide of flour mills and elevators in Latvia was carried out in 2004, and from that time onwards PH_3 has been used. Normally all silos and elevators are fumigated once per year for 4-5 days as a preventive action, depending on the ambient temperature.

2258. State Plant Protection Service said the cost of the PH_3 treatment was $0.56-0.93 per tonne of grain, compared to about $1.00 per tonne with methyl bromide. There was no impact on the mill and elevator operations as each silo was treated separately. The treatment efficacy was often validated using live insects in small cages, strategically placed in different parts of the silo or elevator. The J-system was not used because it was too expensive, even though it was supplied as part of the Project equipment.

2259. In the investment projects, the evaluation concluded that the replacement of methyl bromide with phosphine has been successful in the postharvest sector in Latvia. The costs of the two fumigants were quite similar, there were no special application requirements or safety issues, and the level of pest control in the silos and mills appeared to be similar. Indeed, phosphine seemed to be used as a drop in replacement for methyl bromide.

2260. The combination of affordability and ease of application makes it likely that the replacement of methyl bromide has been sustainable. A range of equipment and materials was procured by UNDP and delivered to Dobele Dzirnavnieks Flour Mill in Dobeles. The materials and equipment were needed for sealing silos, circulating the fumigant, blowers for aeration after the fumigation, safety equipment for personnel, phosphine gas detectors and equipment for recording the

[360] There are about 10 other fumigation companies including Sia TTR, Dzidra, Desina, and Pest Baltic that did not use methyl bromide, and only used PH_3

concentration. There was also cleaning equipment such as industrial vacuum cleaners, and insect and rodent monitoring kits (floor traps, pheromone traps).

2261. Heat treatment equipment such as ThermoNox mobile heating units, an electrical distribution system, an infrared heat measurement gun, and ventilators-blowers to distribute the heat. The equipment was delivered in 2006 and 2007 to Dobele Dzirnavni. Lithuania reported that Grūdų pirkliai UAB in Lithuania and Dobele Dzirnavni have agreed to share the heat equipment, as the number of heat-generating machines supplied to each country alone was not capable of generating sufficient heat in the mill to disinfest the pests.

2262. It was not possible to obtain information from the NOU on the number of heat treatments in mills in Latvia using the equipment provided by the Project. The leader of the workshop (BM Seminar) was also not able to provide information. It was not possible to obtain information from the NOU on the IPM equipment and procedures, such as the vacuum cleaners and pheromone traps provided by the Project. Therefore it was not possible assess the impact of the heat and IPM treatments and to determine whether or not the investment activity had been delivered.

8.7.9.5.1.5 The phase-out of methyl bromide consumption

2263. Latvia imported on average 4.2 ODP-tonnes of methyl bromide per year from 1996 to 2003. Latvia did not import in four of those years, which resulted in zero consumption reported for some years to the Ozone Secretariat[361], although methyl bromide was probably still used. Based on a request from the European Community on behalf of Latvia in 2005, the Parties approved a critical[362] use exemption of 2.5t[363] of methyl bromide for use in grain in Latvia that was applicable from 1 January 2006.

2264. However, the European Commission did not licence the import of any methyl bromide for critical uses by Latvia in 2006, despite the approval of the Parties, as the Commission believed that an alternative to methyl bromide was available. Decision IX/6 of the Montreal Protocol, which guided the Commission in its decision, required Parties to ensure that methyl bromide was only licensed when an alternative was not available or could not be used.

2265. The Commission's decision to not allocate a methyl bromide quota to Latvia for critical uses fully supported the UNDP/UNEP Regional Project which aimed to replace methyl bromide with an alternative. The Project provided Latvia with phosphine fumigation equipment, it supplemented Latvia's knowledge on the use of phosphine, and it provided information and equipment to Latvia on IPM and non-chemical methods of pest control. Collectively, this equipment and knowledge provided Latvia with the potential to replace methyl bromide in a way that was sustainable.

2266. Latvia continues to use phosphine for pest control in flour mills and grain elevators, more than 3-years after methyl bromide ceased to be used for these purposes. Therefore, the objective of the Regional Project to phase out methyl bromide in Latvia was achieved. The sustained phase out of methyl bromide maintained Latvia's compliance with the Montreal Protocol as 2006 was the only year that Latvia resorted to a critical use exemption for methyl bromide.

8.7.9.5.2 Awareness about ODS, ODS substitute technology, and strengthening of institutional capacities to achieve the ODS phase-out

2267. The extensive work in Latvia to increase the awareness of ozone layer depletion was described in Section 8.7.9.5.1.1 *Awareness raising* above. The work on methyl bromide substitute technology, which focused on one enterprise that implemented phosphine as a replacement for methyl bromide for pest control, was described in Section 8.7.9.5.1.4 *Investment activity* above.

2268. The NOU was non-existent at a time when many developing countries had NOUs that had been fully operational for many years. After the NOU was established in September 2004, the NOU's capacity was further strengthened by several GEF-funded projects. The first was a GEF/World Bank Project that targeted all ODS for phase out except methyl bromide and HCFCs. The second

---

[361] Consumption of MB was 15 ODP-tonnes/1996; 0/1997; 9/1998; 0/1999; 0.5/2000; 8.8/2001; and zero from 2002.

[362] Exemptions must comply fully with Decision IX/6 of the Montreal Protocol and are intended to be limited, temporary derogations from the requirement to phase out methyl bromide by 1 January 2005 for all uses except QPS.

[363] Report of the 17th Meeting of the Parties. 2005. Page 43.

was a small Project that aimed to reduce the use of methyl bromide, which was a followed by this third and altogether larger Project on methyl bromide which aimed to phase it out.

2269. The NOU successfully coordinated the work of several government organisations and a private training contractor to deliver information on a range of suitable alternatives to the stakeholders. Phosphine was used as the alternative to methyl bromide for pest control. The combination of lectures and hands-on activities in Latvia using both government and commercial sources of information expedited uptake of this alternative by mill owners and the subsequent elimination of the use of methyl bromide.

8.7.9.5.3 Authority / credibility, necessary to influence policy and decision-makers

2270. The NOU in Latvia had the authority / credibility, necessary to influence policy and decision-makers, which was shown mainly through the NOUs actions and ability:

- To provide methyl bromide publications and materials to support *awareness-raising* activities;
- To implement *policies and measures* to control of methyl bromide, bringing together policy makers, Customs officers, importers, users, producers;
- To coordinate *training courses/workshops* to educate stakeholders on alternatives and to develop training strategies for local extension workers on promoting and implementing alternatives;
- To encourage *investment activity* to implement suitable methyl bromide alternatives for control of pests in soil (pre-harvest) and durable commodities (post-harvest); and
- The phase out of non-QPS methyl bromide consumption.

2271. This credibility has been established by an NOU within the MoE that cooperated with a diverse range of government bodies in Latvia that were involved in ozone-depleting substances (Section 8.7.9.3.2 *Socio-political* above described these bodies). The NOU was assessed as capable of carrying out tasks on methyl bromide reduction and phase out due to a combination of political, technical and administrative expertise.

8.7.9.6 Assessment of monitoring and evaluation systems

8.7.9.6.1 Monitoring and evaluation design

8.7.9.6.1.1 UNDP

2272. UNDP took responsibility for the monitoring and evaluation of the investment component. At the end of each project year, the UNDP Montreal Protocol Unit aimed to evaluate the degree to which the objectives of the investment project had been achieved. Supervision missions were planned to be undertaken by relevant experts appointed by UNDP as necessary. The UNDP monitoring and evaluation activities were to be in addition to the normal monitoring and evaluation activity in the project undertaken as standard UNDP procedures.

In the participating countries, independent bodies were identified to also be responsible for M&E activities, as it was considered important to reduce the implementation period to meet the phase out deadlines. The M&E body was designed to act as a continuous management tool, visiting MB users, identifying success and failure factors, and providing information to the Project Coordination Unit and particularly feedback to the Steering Committee and Technical Committee, consultants and Implementing Agencies. The implementation, coordination and monitoring arrangements for the UNEP/UNDP/GEF Project[364] were shown in Figure 20 on page 224.

8.7.9.6.1.2 UNEP

2273. UNEP designed an annual monitoring and evaluation format to assess the non-investment activities, and also provided a Final Assessment design which aimed to report on the results of the project.

[364] From: UNDP. 2003. Total Sector Methyl Bromide Phase Out in Countries with Economies in Transition. GEF – UNDP Project Document. 29 pp. Page 25.

8.7.9.6.1.3 *Annual evaluation by UNEP*

2274. UNEP completed a '*Project Performance and Risk*' Table annually that measured and rated progress toward achieving the project objectives and assessed implementation progress. The progress was reported for each of the countries individually.

2275. The attainment of the project objective, which was '*preservation of the ozone layer'*, was measured against the outcome of a '*Sectoral phase out of methyl bromide in countries as required by the schedule of the Montreal Protocol*'. This outcome was defined as uses that were non-QPS and non-CUE, as both QPS and CUEs were permitted under certain conditions.

2276. UNEP's M&E design[365], which aimed to annually measure implementation progress, referenced the requirement to monitor '*outputs*' (Table 47, column 2). UNEP also reported on progress with the implementation of the investment activity that was under the responsibility of UNDP.

Table 47: UNEP-designed "outputs" and "indicators" that were used to monitor progress and evaluate success in the methyl bromide phase out project implemented in Bulgaria

NO	OUTPUT	INDICATOR
Column 1	**Column 2**	**Column 3**
Document	*5) Project Performance and Risk* 2) *Final Evaluation*	*6) Final Evaluation*
1	Development and implementation of cost-effective, sustainable, national phase out coordination structures and mechanisms to carry out the project work, cope with future methyl bromide phase out problem areas, and sustain phase out post-project	Permanent National Steering Committee, Technical Group, and trained extension service and user groups in countries at project end; registration of additional pest control products where needed; implementation of additional policy measures where needed.
2	Rapid transfer of replacement technologies to MB users, including installation of equipment and participatory training at local level, focusing on a quick replacement for the 2005 growing season to permit country compliance with the Montreal Protocol, [focus on non-chemical and IPM MB alternatives from 2006 onwards][366] [using fumigants/chemicals as necessary][367]	Replacement of MB use in sectors by chemical and non-chemical alternatives at the end of the project
3	Enhanced awareness and confidence of MB users and other stakeholders in the phase out process, through the monitoring of the efficacy and economic performance of alternatives, and increased ability of users to manage pest control problems and find solutions	Detailed regular reports by the Project Coordination Unit and the National M&E Unit on the progress of the MB replacement amongst MB users across sector and sub-sectors. Survey reports of the national M&E Unites, will include investigations into the mindset of the MB users towards the project and phase out exercise
4	Capacity building for the development of more environmentally friendly MB alternatives (primarily based on non-chemical methods), reducing dependency on fumigants/chemical alternatives to ensure sustainability in the long term	Reports by the Project Coordination Unit and the National M&E Unit on the progress of non-chemical and IPM MB alternatives amongst MB users across sector and sub sectors

[365] UNEP. 2008. GEF PIE FY 2008 (for the period 1 July 2007 to 30 June 2008).
[366] Text in UNEP "Annual Evaluation" but not "Final Evaluation"
[367] Text in UNEP "Final Evaluation" but not "Annual Evaluation"

2277. UNEP also completed annually a '*Risk Factor*' Form, which was a combination of text and check boxes. The Project Manager and the Task Manager assigned ratings to the perceived risk as either '*low, medium, substantial, high, not applicable or to be determined*' for a range of project criteria: Project Management (Management structure, governance structure, internal communications, work flow, co-finance, budget, financial management, reporting, stakeholder involvement, external communications, short/long term balance, science and technological issues, political influences, other); and Project Context (political stability, environmental conditions, social/cultural/economic factors, capacity issues, other).

2278. UNEP also completed a '*Rating Monitoring and Evaluation*' Form, including the M&E activities that were carried out during the reporting period. The mainly text answers in this section covered a broad range of issues, such as the quality of the initial baseline methyl bromide consumption, the usefulness of the indicators that were used to assess performance, any challenges faced by UNEP to obtain data that were required to assess the indicators, and lessons learnt in regard to M&E.

8.7.9.6.1.4 Final Evaluation

2279. UNEP's M&E design[368], which aimed to measure the overall success of the project, referenced the requirement to monitor '*outputs*' (Table 47, column 2) and '*indicators'* (Table 47, column 3). The '*indicators'* were used by UNEP only for the Final Evaluation and they were not used in the Annual Evaluation. UNEP also reported on the overall success of the investment activity that was under the responsibility of UNDP.

8.7.9.6.1.5 Evaluation comments on M&E design

2280. The following comments address the ability of the M&E design to track and monitor progress toward achieving the project's objectives:

- The annual implementation progress was not measured against the performance indicator, and it was difficult to see how progress was therefore determined;
- The output often contained more than one element (e.g., cost-effectiveness, coordination, structures/mechanisms, future problem areas), but the response by UNEP addressed some of them;
- Some elements were used in the as an output, but a performance indicator was not developed to measure the output e.g. cost-effectiveness[369];
- '*Problems in delivering outputs'* was a column on the Form that was rarely if ever completed by UNEP, which suggested that the projects had no difficulties achieving the outputs required;
- '*Expected completion date'* was a column on the Form that was rarely if ever completed by UNEP, which showed that SMART indicators were not used;
- The column format resulted in very long reports because for most of the form only about one-quarter of the page could be used, which made reading the form difficult;
- One Risk Factor table was completed for all five countries involved in the project, whereas in reality the risks were not uniform for all countries;
- The methyl bromide baseline for the project did not take account of the latest consumption data reported to the Ozone Secretariat at the time of the initiation of the project, which resulted in greater expenditure than needed to eliminate less methyl bromide than originally determined by the baseline;
- The evaluation of the M&E undertaken during the project was helpful as it assessed the status and quality of the M&E procedures; and
- The indicators used in the Final Evaluation should have been used to measure performance in the Annual Evaluation.

[368] UNEP. 2008. Project Final Report – Bulgaria. 8 pp.

[369] The cost-effectiveness of alternatives to methyl bromide is very difficult to measure as it depends on the timing of the market, the methods used by the farmer, the level of pest infection at the time, and many other factors. At no stage was the financial value addressed, suggesting that cost-effectiveness was addressed superficially.

2281. These limitations in the M&E design were assessed as reducing the ability of UNEP to assess the progress in the implementation of the project that aimed to introduce alternatives to methyl bromide in Latvia.

2282. UNDP's Monitoring and Evaluation Plans were contained in Annex 5A: *Monitoring, Progress Reporting and Evaluation* and Annex 5B: *Terms of Reference for the Regional/International Project Steering Committee.* These Annexes were omitted from the UNDP Project Document and could not be evaluated.

8.7.9.6.2 Monitoring and evaluation plan implementation

2283. The M&E plans (Annual M&E and Final M&E) were implemented by UNEP, as evidenced by the reports provided to the evaluators. There were no reports that were made available to the evaluators from UNDP.

2284. Although the design of the M&E plan had limitations, its value lay in the 'follow-up' by UNEP that clearly signalled to participants that their progress in this project was being monitored and evaluated. In addition, UNEP required reporting from participants on progress, which was then used to in these annual reports, and workshops were held to share information and keep the project on track.

8.7.9.6.3 Budgeting and Funding for monitoring and evaluation activities

2285. UNEP budgeted $10,000 for the "*…risk evaluation and development of the monitoring and evaluation strategy…*", and $5,000 for the "*… Evaluation Report (including survey results, needs (technical, financial, policy, training), awareness strategy, identification of co-funding partners, preliminary risk evaluation results…*". These direct costs associated with M&E activities may have also been supplemented by UNEP's activities in general, in their role as Project Coordinator/Consultant. UNDP also was assigned a budget of $45,000 for travel and national consultants, but funds for M&E were not separately identified.

2286. The funding for M&E represents 6.7% ($15,000 of $225,000) of the total budget which, for an important activity, appeared to be relatively small. There was no information on budget versus expenditure and therefore it was not possible to assess the timing of the funding and compliance of expenditure with the budget assigned.

2287. The budget assigned by UNDP for M&E activities was provided in the Annex to the Project Document, but this was omitted from the document that was made available for assessment.

8.7.9.6.4 Long-term monitoring

2288. There was no requirement for long term monitoring in this project. However, Latvia as a Member State of the EU has national reporting obligations under EU legislation on methyl bromide that it is imported or produced for feedstock and process agent uses[370]. Other uses of methyl bromide are no longer permitted under EU legislation after 18 March 2010, and therefore there are no other reporting requirements related to methyl bromide.

2289. Article 7 "*Reporting of data*" in the Montreal Protocol requires Parties to report by 30 September each year on their consumption and production of ODS in the previous year. Hungary reported 2003 consumption data to the Montreal Protocol, but consumption data for 2004 onwards was reported by the European Commission on behalf of the EC, including Latvia as a new Member State.

2290. In addition, Decision XV/15 that was agreed in 2003 encouraged Parties to forward data on consumption and production to the Secretariat as soon as the figures became available, and preferably by 30 June each year, rather than 30 September in order to facilitate the work of the Protocol's Implementation Committee. The Implementation Committee has not remarked on any aspects of data reporting by Latvia, which suggested that reporting had been timely and accurate. The Ozone Secretariat reported in 2009 that most Parties complied with the voluntary June deadline.

2291. Data reporting by the EU to the Montreal Protocol on methyl bromide consumption is the most important action on long-term monitoring. Zero consumption reported by Latvia to the EU

[370] Article 27 of Regulation (EC) No 1005/2009 on Substances that Deplete the Ozone Layer that came into force on 1 January 2010

would result in zero consumption being reported by the EU to the Montreal Protocol. An EU report of zero consumption would indicate that methyl bromide has been phased out in the EU including Latvia, and continual reporting of zero consumption annually by the EU would indicated that the phase out has been sustained.

2292. Data reporting, and the infrastructure necessary for this, is expected to continue for ozone-depleting substances in general and for specific methyl bromide uses as described above. The costs for these data reports are expected to be included in the annual budget by the government of Latvia for work assigned to the NOU.

8.7.9.7 Assessment of processes that affected attainment of project results

8.7.9.7.1 Preparation and readiness

2293. The main activity that indicates preparation and readiness for a project is the legislation that was in place in Latvia prior to the start of the project to control methyl bromide, and the government and commercial infrastructure necessary to implement alternatives to methyl bromide that was in place in Latvia prior to the start of the project.

2294. In 2002 and well before Latvia's start of the project in September 2006, Latvia had in place *inter alia* legislation that banned non-QPS methyl bromide from being placed on the market after 31 December 2004; required precautionary measures to prevent and minimise leakages of methyl bromide from fumigation installations and operations in which methyl bromide is used; and that defined the minimum qualification requirements for the personnel involved in methyl bromide fumigation.

2295. The earlier project entitled "*Initiating early phase out of methyl bromide in CEITs through awareness raising, policy development and demonstration/training activities*" had helped to set up the infrastructure that was needed to implement the current project. That project had been instrumental in establishing a team in Latvia that consisted of specialists on alternatives to methyl bromide, trainers to deliver workshops on alternatives, government ministries that were monitoring and reporting on the use of methyl bromide, awareness raising activities, and policy development. Commercial companies were involved in the workshops. Latvia's use of methyl bromide was small - an average of 4.2 ODP-tonnes of methyl bromide per year from 1996 to 2003) – but nevertheless needed to be replaced by an alternative.

2296. A new regulation[371] on ozone-depleting substances and fluorinated gases came into force on 1 January 2006 in Latvia to fully implement the requirements of EU legislation, which replaced all previous versions on ODS legislation. Ozone-depleting substances and fluorinated gases (F-gases) were integrated into the one legislative instrument because F-gases are replacements for ozone-depleting substances in many cases, and the training in the best practice management of equipment containing ozone-depleting substances and F-gases is similar.

2297. Latvia was assessed as prepared and ready for this project, mainly because of two previous projects on ozone-depleting substances, and due to legislation that had been put in place to control methyl bromide. The government and commercial infrastructure necessary to implement alternatives to methyl bromide were also in place well before the start of the project.

8.7.9.7.2 Country commitment and motivation

2298. The country commitment and motivation can be determined by the government commitment to funding of activities on ozone layer protection. During the Project the NOU in Latvia had a staff of 1.5 FTE[372]. They were assisted by contracted and voluntary assistance from local experts, according to the budget and sub-project. Today, the NOU consisted of 0.25 FTE as the one person remaining allocated most time to non-ODS issues. As in other Ministries and departments, the MoE has had to reduce staff in response to the economic crisis[373].

2299. The NOU had not examined the data reported on ozone-depleting substances that had been supplied by other agencies, departments and ministries. Such an examination would have

[371] Decree 688 "Regulations on Ozone Layer Depleting Substances and Fluoride Greenhouse Effect Gases, which are Refrigerating Mediums", adopted 6 September 2005.

[372] Full-Time-Equivalent.

[373] Financial Times 12 May 2009 "Latvian economy slides by 18%". In general, Latvia's financial performance in 2009 is likely to be the worst among the 27 Member States, as GDP reduced by 18% in 2009 (compared to a 10% increase in 2008).

allowed the NOU to provide support for any amendments that the NOU might wish to put in place to improve the implementation of the legislation on the control of ozone-depleting substances in Latvia, and to put in place procedures that improve the management and phase out of ozone-depleting substances. There is a risk that a disruption to one of the ODS control measures would not be detected in a timely manner, which could result in more ozone depletion than would otherwise be the case.

2300. There is a risk that ozone layer protection will be accorded lower priority for funding in times of economic crisis, and that other environmental initiatives currently underway will be seen has higher priority for funding.

2301. Without EU legislation, the government of Latvia appeared weakly motivated to take action on ozone-depleting substances. After 1 May 2004 when Latvia joined the EU, Latvia's motivation appeared to be strengthened by the potential action taken by the EU in the event of non-compliance with EU legislation on ozone-depleting substances. The EU legislation that increased Latvia's motivation was described in Section 8.7.9.3.4 on page 428.

8.7.9.7.3 Stakeholder involvement

2302. The main stakeholders involved were SJC Dobeles, as the largest grain processing company in Latvia, produces flour, grits, pearl barley, bran and pet food for the wholesale and retail trade; Labibas Sargs as one of 10 fumigation companies in Latvia and the only one that was using methyl bromide for mill fumigation (the others used phosphine); the NOU within the Ministry of Environment (MoE) who was the Executing Agency; the Latvian Environment, Geology and Meteorology Agency who was responsible for compiling statistics on the quantity of ozone-depleting substances used and for what purposes; the Baltic Environmental Forum (BEF) who provided technical assistance; the State Plant Protection Service who has a general mandate for maintaining national plant health and plays major role in the agrochemical registration process, education, training and supervision; the Ministry of Agriculture; and the State Health Agency.

2303. The government of Latvia had put in place the structure that it believed was able to be responsive to the work on the elimination of methyl bromide. The government has implemented a multi-stakeholder approach that assigned responsibility to different services, administrations and ministries to undertake activities on monitoring and reporting of the use of methyl bromide. The responsibilities of the stakeholders were mandated by national legislation. In this way, the NOU itself could remain relative small with a strategic role, knowing that other stakeholders had assigned responsibilities in ozone layer protection.

8.7.9.7.4 Financial planning

2304. UNEP reported that the funds were correctly managed and transparently accounted for in the project. There was also no concern whatsoever on the financial management and planning as all budgets were managed as expected in the sub-projects and MOUs of the project. UNEP reported that financial and progress reports by Latvia were sometimes later than expected. Expenditure in some countries did not reach the budget, which enabled UNEP to re-allocate funds in response to end-of-project requests for activities that were slightly over the budget.

2305. In October 2006 at the International Project Steering Committee Meeting in Sofia, the participants recommended that future projects should put in place procedures to source financial support for the use and refinement of alternatives and technology after the project is completed. In 2007, discussions were initiated on potential EC funds that could be used to support long-term research and validation of alternatives.

8.7.9.7.5 UNEP supervision and support

2306. UNEP reported that reports submitted by the countries in this project were *"… substantive reports presented in a timely manner … they were complete and accurate with a good analysis of project progress and implementation issues".* At the final meeting of the project participants in October 2006 in Plovdiv, there was general appreciation for UNEP's assistance and guidance that had been given to countries during the course of in this project.

8.7.9.7.6 Co-financing and project outcomes & sustainability

2307. There was no requirement for co-finance of the activities of UNDP and UNEP in this programme.

However, France committed to provide $50,000 toward the project development costs of UNDP and UNEP, but these funds did not eventuate[374]. The UNEP budget included $1,921,929 of in-kind co-finance[375] for non-investment activities, and the UNDP budget included expected in-kind contributions of $373,400[376] for investment activities. The amount of co-finance declared by Latvia for non-investment and investment activities in this project was not available.

2308. In 2008, UNEP reported that co-financing from four out of the five countries exceeded the co-finance envisaged at the start of the project start[117]. The co-finance was for office space and facilities for national project personnel and international experts working on the project; for participation of Government personnel that implemented project activities; for providing transportation, facilities for installation of equipment, and logistic support to the project; for communications; for personnel for technical assistance, site visits; and for personnel and other resources for the monitoring and evaluation exercises. In the case of Latvia, UNEP reported that it had yet to quantify its level of co-finance[377].

2309. A significant level of in-kind co-finance demonstrated the commitment of a country to the project and probably increased its "ownership" of the programme. Increased ownership has been shown in other projects to promote sustainability, since the government and commercial commitment is greater than when there is a financial stake in a successful outcome to the project.

2310. Although co-finance is important, there were other factors that were assessed as having a greater impact on the sustainability of the programme than co-finance, such as the EU legislative requirement to eliminate the use of methyl bromide by 31 December 2004 (see Section 8.7.9.3.4 on page 428). However, a sustainable source of funds to support the continued implementation of alternatives, and the refinement of the alternatives, after the project finished was considered very important by the members of the National Steering Committee at their meeting in October 2006. Further monitoring of pest problems may be warranted as a result of global warming which may result in warm-adapted pests extending their southern range northwards toward Hungary in the future.

8.7.9.7.7 Project implementation delays and impact on project outcomes & sustainability

2311. Procurement of equipment by UNDP Bratislava office was delayed because of UNDP difficulties coordinating between the national Customs authorities and the involvement of UNDP personnel in some of the countries in the project. The variety of rules and practices in the different countries was not anticipated by UNDP, and each country had to be addressed individually in each case, which contributed to the overall delay in procurement and imports.

2312. Although procurement and project closure were delayed, these delays did not affect the national phase out since appropriate registration and legislative instruments were required by EC legislation to be in place, which prevented any prospect of a return to the use of methyl bromide. Restrictions on methyl bromide use, sale and import in Hungary had been implemented according to Regulation (EC) No 2037/2000 in Latvia in advance of Latvia's accession to the EU on 1 May 2004.

2313. The mills in Latvia have eliminated their use of methyl bromide. However, the food industry is still dependent on chemical fumigation, which may not be sustainable due the toxicological review required under Regulation (EC) No 91/414 that has led to restrictions on the use of many fumigants and the elimination of many of them. The inability to register new formulations of traditional fumigants, and to maintain registration for existing fumigants, threatens the ability of users to have access in the longer term to effective pest control procedures. Inappropriate use of phosphine has resulted in insect resistance and reduced its ability to control pests in mills. Despite these problems with continuing use of chemical fumigants, the possibility of going back to methyl bromide is not an option as there are now several legislative instruments in the EU that ban the use of methyl bromide due to its toxic properties, and non-chemical pest control methods for mills have existed for many years.

---

[374] UNEP. 2008. GEF PIR FY2008. 50 pages
[375] UNEP. 2008. UNEP GEF PIR FY 2008 Review 1. For the period 1 July 2007 to 30 June 2008. 50 pp
[376] UNDP. 2003. Total Sector Methyl Bromide Phase Out in Countries with Economies in Transition. GEF – UNDP Project Doc. 29 pp.
[377] UNEP. 2008. UNEP GEF PIR FY 2008 Review 1. For the period 1 July 2007 to 30 June 2008. 50 pp

8.7.9.8 Sub-Project Rating

GF/4040-05-05 Total Sector Methyl Bromide Phase Out in Countries with Economies in Transition - Latvia		
Criterion	**Evaluator's Summary Comments**	**Evaluator's Rating**
Attainment of project objectives and results Sub criteria (in yellow below)	See comments below	
Effectiveness	The project aimed to eliminate non-QPS uses of MB by 31 December 2004, but Latvia did not commence in the project until September 2006. This meant that effectiveness was focused on sustainability as no methyl bromide could be used in 2006	S
Relevance	Conversion to non-ODS technology, awareness raising programmes and other activities were consistent with minimising the detrimental effect of ODS on the ozone layer	HS
Efficiency	Cost-effectiveness of sustaining the methyl bromide phase out in Latvia was relatively expensive, compared with methyl bromide phase out projects undertaken in developing countries.	S
Sustainability of Project outcomes (overall rating) Sub criteria (in yellow below)	See comments below	
Financial	The prospects for continuing finance by the government of Latvia on activities relating to the reduction and phase out of ozone-depleting substances were assessed as likely, but at a modest level given the difficult financial conditions	S
Socio-Political	Adequate socio-political support for ongoing activities that will reduce ozone depletion	S
Institutional framework and governance	Range of government organisations involved, legislation in place, experienced personnel, training in best-practice management of alternatives to methyl bromide	HS
Environmental	EU legislation compels further action on ozone-depleting substances, especially the latest legislation that came into force in 2010	HS
Achievement of outputs and activities		

GF/4040-05-05 Total Sector Methyl Bromide Phase Out in Countries with Economies in Transition - Latvia		
Criterion	**Evaluator's Summary Comments**	**Evaluator's Rating**
Monitoring and Evaluation (overall rating) Sub criteria (in yellow below)	See below	
M&E Design	UNEP designed an annual monitoring and evaluation format to assess the non-investment activities, and also provided a Final Assessment design which aimed to report on the results of the project.	S
M&E Plan Implementation (use for adaptive management)	Annual and final evaluations were useful, but limitations in the design reduced the ability of the M&E task to provide assistance to countries	S
Budgeting and Funding for M&E activities	Funding for M&E was 6.7% of total budget which appeared relatively small	S
Catalytic Role	No categorisation required	
Preparation and readiness	Latvia was prepared and ready, mainly due to two previous projects that helped to strengthen the NOU and to have legislation in place	S
Country commitment and motivation*	Not motivated as a country, but EU legislation has provided motivation now the Latvia is a Member State	S
Stakeholder involvement	Multi-stakeholder approach based on assigned responsibility to different services, administrations and ministries	S
Financial planning	Funds were reported to be correctly managed and transparently accounted for in the project	S
UNEP supervision and support**	UNEP had a good working relationship with Latvia that covered work plan implementation, progress reports and financial reporting	S
Overall Rating		S

Highly Satisfactory (HS); Satisfactory (S); Moderately Satisfactory (MS); Moderately Unsatisfactory (MU); Unsatisfactory (U); Highly Unsatisfactory (HU);
*Motivation replaced TOR '*driveness*'; **Support replaced TOR 'backshopping'

8 Lithuania

8.8.1 Background

2314. Lithuania proclaimed its renewed independence from the Soviet Union on 11 March 1990, the first Soviet republic to do so, and began its transition to a market economy the following year. Owing to the availability of inexpensive natural resources, the industrial sector had become excessively energy intensive, inefficient in its utilization of resources, and incapable of manufacturing internationally competitive products[378]. At that time, more than 90% of Lithuania's trade was with the former Soviet Union, which supplied Lithuanian industry with raw materials for production and a market for its outputs.

2315. In 1997, exports to former Soviet states were 45% of total Lithuanian exports. The economy had survived the early years of uncertainty and several setbacks, including a banking crisis, and seemed poised for solid growth. However, the collapse of the Russian rouble in August 1998 caused a recession in Lithuania and forced the reorientation of trade toward the EU which increased over time to 63% in 2006. The process of privatization and the development of new companies slowly moved Lithuania from a command economy toward a free market. Lithuania has privatized nearly all formerly state-owned enterprises. Today, more than 79% of the economy's output is generated by the private sector.

2316. Like many of the countries that became independent of the former Soviet Union in the early 1990s, Lithuania at the time had made a significant effort to reduce imports of ODS, in anticipation of the imminent closure of CFC and halon production in the Russian Federation. They wanted to eliminate the dependency on predominantly Russian imports by putting in place procedures that would avoid disruption to the users of equipment when the supply in Russia ended. In 1995, approximately 55% of the ODS (mostly CFC-12) was used for refrigeration and air-conditioning, 13% for aerosol production, 20% for degreasing and cleaning and 12% for other purposes.

2317. In 1996, Lithuania had acceded only to the Vienna Convention and the Montreal Protocol. It was not until February 1998 that Lithuania ratified the London and Copenhagen Amendments. Lithuania has most recently accepted the Montreal and Beijing Amendments on 17 March 2004. As a developed country and a signatory to the London and Copenhagen Amendments by the beginning of the Project in May 1998, Lithuania was required to comply with the control schedule in the Montreal Protocol which, *inter alia*, required the phase out of the consumption of halon on 1 January 1994; and the phase out CFCs, methyl chloroform and carbon tetrachloride on 1 January 1996.

2318. Largely as a result of the severe economic turmoil but also because of its participation in the Montreal Protocol, Lithuania reduced its consumption of CFCs from more than 4,000 ODP-tonnes in 1990 to 289 ODP-tonnes in 1996. Despite this significant effort, in 1996 Lithuania was in non-compliance with its control obligations under the Montreal Protocol because of the consumption of ODS that should have been phased out in that year.

2319. In 1998, after a meeting with the Protocol's Implementation Committee, the Parties to the Protocol encapsulated Lithuania's commitment to a phase-out plan with interim benchmarks in a Decision[379] that aimed:

- To ban the import of CFC-113, carbon tetrachloride and methyl chloroform by 1

[378] US State Department. Background note: Lithuania.
[379] Decision X/25: *Compliance with the Montreal Protocol by Lithuania*. See also Decisions VIII/23 and IX/30.

January 2000; and

- To reduce the consumption of Annex A and B substances by 86 per cent from 1996 levels by 1 January 2000;

2320. Lithuania was encouraged in the same Decision by the Parties to strictly apply the existing import licensing system and to work with the Customs authority to ensure that imports of ODS ceased. Lithuania did not produce or export ODS. An application to the Parties by Lithuania to allow the import of CFCs for servicing was rejected by the Parties. Instead Lithuania was encouraged by the Parties to increase the recovery of existing ODS or to import recycled material to satisfy its servicing requirements[380]. A previous Decision by the Parties in 1997 had advised the GEF to consider favourably Lithuania's request for financial assistance for projects to implement the country programme to phase out ODS.

8.8.2 Generalised objectives, output and performance indicators

2321. The design of the UNEP and UNDP projects for Lithuania did not require clearly defined logframe analysis and prior agreed performance indicators (PIs) at the time of their formulation and approval. The 2004 Mid-Term Review undertaken for the UNEP-managed projects identified the issue of the absence of results-based management and accountability framework, including the lack of PIs in the UNEP sub-projects.

2322. In the absence of these PIs, project outputs and outcomes and PIs based were developed for this Terminal Evaluation Assessment, based on the results of the mid-term evaluation, the UNEP PIRs and achievements that became evident during the assessment of each of the sub-projects. Table 45 summarises these generalised objectives, outputs and outcomes that were used as a guide in the assessment of each of the sub-projects in the Lithuania country report[381].

Table 48: Generalised objectives, outputs and outcomes that were used as a guide in the assessment of each sub-project

Objectives/Intended Results	Outputs/Deliverables	Outcomes/Performance indicators
1. Strengthening of the national capacity to effectively coordinate and administer the actions outlined in the Country Programme and the Refrigerant Management Plan	1. Establishing the National Ozone Unit and initiating actions that created a suitable climate in the country for the expeditious phase-out of ozone-depleting substances (ODS) 2. Political priority assigned by the Government to environmental issues and to the objectives of the Montreal Protocol in particular	1. Strengthened institutional capacity and improved coordination among stakeholders: • Time required for UNEP to disburse the first funding tranche • Timely recruitment of sufficient and qualified National Ozone Unit staff • Timely establishment of adequate infrastructure • Provision of the counterpart funding • Continuity of National Ozone Unit staff and operation • Ratification of Montreal Protocol Amendments • Establishment of the Interagency Committee • Approval of the Action Plan • Access of National Ozone Unit staff to decision makers
2. Legislative measures that promote the phase-out of ODS	3. Development, promotion and adoption of legislative acts and regulations on control of ODS	2. Introduction of legal acts regulating ODS import related issues and their enforcement: • Adoption of legislation on ODS import/export licensing system

[380] Imports of recycled material do not contribute to a Party's officially reportable ODS consumption under MP Art. 7

[381] As each Country Report is a self-contained chapter with its own Annex, for completeness (but at the expense of repetition) the same Table showing these generalised objectives, outputs and outcomes was provided in each Country Report.

Objectives/Intended Results	Outputs/Deliverables	Outcomes/Performance indicators
		• Establishment of ODS import quota system • Register of authorized importers • Introduction of ban on trade of ODS and equipment containing ODS • Adoption of qualification requirements for servicing activities • Adoption of legislation that mandates ODS recovery, reclamation and recycling • Measures on enforcement of legislation through training of customs officers • Change of market price between CFCs and substitutes
3. Increased coordination and monitoring of the Country Programme and the Refrigerant Management Plan	4. Effective interaction with governmental institutions and agencies 5. Increased cooperation with business sector and professional associations 6. Assistance in the coordination and monitoring of the implementation of investment and training sub-projects executed by Implementing Agencies as part of the Refrigerant Management Plan	3. Improved coordination and monitoring in implementation of the Country Programme and the Refrigerant Management Plan: • Evidence of access of National Ozone Unit to, and interaction with, decision makers • Involvement of private sector stakeholders • Establishment and support of the Refrigeration Association • Successful completion of training of custom officers together with UNEP • Successful completion of training of good servicing practices • Successful completion of training of ODS recovery, reclamation and recycling operators • Successful completion of conversion of to non-ODS technology
4. The design and implementation of ODS awareness programme	7. Conducting awareness workshops for central and regional governmental officials, environmental inspectors and customs officers on Montreal Protocol objectives 8. TV and radio interviews on ozone layer protection issues 9. Dissemination of booklets about ozone layer protection, and implementation of National ODS Phase out Programme	4. Improved communication with, and effective engagement of governmental and non-governmental institutions, professional organizations, private sector and general public, in ODS phase out activities 5. Reduction of ODS consumption due to public awareness programme • Number of workshops and degree of participation of institutions listed in (4) above • Number of publications prepared and disseminated • Degree of market penetration of ODS-free products and methodologies
5. Support and encourage local industry and technical institutes to adopt ODS-free substitute technologies	10. Support in conversion of manufactured equipment to non-ODS technology 11. Coordination in the provision of modern tools and equipment to servicing	6. Adoption ODS-free substitute technologies 7. Adoption of good servicing practices and availability of modern tools in the refrigeration sector, including recovery and

Objectives/Intended Results	Outputs/Deliverables	Outcomes/Performance indicators
	workshops in the domestic, commercial refrigeration and air-conditioning sectors	recycling • ODP-tonnes phased out • Number of servicing sets provided to servicing enterprises
6. The collection of required data on ODS use and consumption, establish the lines of communication in the country and reporting to the Ozone Secretariat and Implementing Agencies	12. Collection, analysis and exchange of Montreal Protocol-related information in the country and the region 13. Preparation of annual reports on ODS consumption and National Ozone Unit activities to the Ozone Secretariat 14. Preparation and submission of necessary information and reports to the Implementing Agencies 15. Exchange of experience between the National Ozone Unit and other Network members to combat illegal trade in ODS, including sub-regional cooperation	8. Establishment the line of communication with the Customs authority and licensed importers as a means of collecting ODS import data 9. Establishment the line of communication with National Ozone Units in border countries: • Creation of ODS database • Availability of Montreal Protocol-related information on the Ozone-Secretariat website • Reports of the Implementation Committee • Participation in Central Asia and Eastern Europe Networking • Assessments of the quality of the National Ozone Unit reports by Implementing Agencies
7. Country reduction and phase out of the consumption of controlled ODS by the agreed date	16. Coordination of the implementation of the National ODS Phase out Programme	10. Compliance with ODS phase out schedule established by the Parties in a specific Decision, as a result of the considerations of the Protocol's Implementation Committee

8.8.3 Sub-Project finance

2323. The aim of the overall Project was to assist Lithuania to eliminate mainly CFCs by providing financial support to:

- Assist Lithuania to prepare the country programme, and to identify technical assistance & investment actions that would enable ODS phase out;
- Strengthen the government institutional capacity to coordinate and manage the phase out of ODS;
- Establish a network of refrigerant recovery, reclamation & recycling operations, as well as training in the best practices of refrigerant management; and
- Assist a refrigerator manufacturer, an aerosol enterprise and a compressor manufacturer to eliminate their uses of ODS.

2324. The sub-projects that were formulated to assist Lithuania to eliminate 390 ODP-tonnes per year of ODS were:

- GF/2110-99-02 Institutional Strengthening for the Implementation of the Montreal Protocol in Lithuania (UNEP);
- LIT/97/G32 National programme for recovery and recycling of ODS refrigerants (UNDP/UNOPS);
- LIT/97/G33 Phase out of the use of CFCs in the production of aerosols at Vilnius Buitine Chemija (UNDP/UNOPS);
- LIT/97/G34 Elimination of the use of CFCs in the manufacture of domestic refrigerators and freezers at Snaige (UNDP/UNOPS); and
- LIT/97/G35 Conversion of the manufacturing facility at ARUVA to enable mass production of HFC-134a compressors (UNDP/UNOPS).

2325. The budget for the GEF Project was approved on 5 May 1998 and is shown in detail in Table 49. Lithuania declared $3,595,075 as in-kind co-finance from the beginning of the project for government staff costs, as well as for the provision of office space, transport and communications.

Table 49: Summary of GEF Programme duration, ODP tonne target and budget in Lithuania

Title	Executing Agency	Project Document Signature	Duration	ODP Phase-out (Tonnes)	GEF budget* (US$)
Country Programme & Project Preparation in Latvia and Lithuania*	UNEP and UNDP	16/7/96	1.5 years	N/A	182,520
Institutional Technical Assistance	UNEP	3/5/99	3 years	N/A	165,000
Recovery & Recycling	UNDP	5/5/1998	2years	9.72	165,457
Vilnius Buitine Chemija	UNDP	5/5/1998	2 years	245.6	457,395
Snaige	UNDP	5/5/1998	2 years	111.7	2,044,793
Oruva	UNDP	5/5/1998	2 years	20.0	1,743,938
Total				**387.02**	**4,759,103**

*50% of combined UNDP & UNEP budgets

2326. The Institutional Strengthening sub-project was completed by 31 March 2005. The investment sub-projects were completed earlier in June 2001.

8.8.4 GF/2110-99-02 Institutional Strengthening for the Implementation of the Montreal Protocol in Lithuania (UNEP)

8.8.4.1 Introduction

2327. The general objectives of the sub-project were to raise awareness of ozone depletion and to promote industry to install ODS-free technology; to strengthen the institutional infrastructure to deliver the ODS phase-out; and to enable Lithuania to be compliant with the Montreal Protocol phase-out schedule for developed countries by 2000. The successful implementation of this sub-project also became important for Lithuania's compliance with the ODS phase out requirements of the EU, which were more stringent than the Montreal Protocol, in preparation for Lithuania's accession to the EU in 2004.

2328. The Institutional Strengthening Project Document was signed by UNEP on 3 May 1999. The intended completion date was May 2002, but this was extended to 31 March 2005 because of difficulties integrating the NOU into the MoE. The budget was $165,000 over the 3 year duration of the project.

8.8.4.2 Attainment of objectives and planned results

8.8.4.2.1 Effectiveness

2329. Buxton and Circonkov (2004) in their mid-term evaluation of this sub-project reported that there were no specific achievement or performance indicators in the original Project Document[382]. They suggested that effectiveness could be evaluated against the following outputs which were implied in the Project Document:

- Establishment and effective functioning of an NOU;
- Awareness raising activities completed;
- Alternative ODS technologies adopted by industry;
- Annual reports submitted to the Montreal Protocol on the consumption of ODS; and
- The phase-out of ODS consumption, in compliance with Montreal Protocol decisions.

2330. With strengthened institutional capacity, Lithuania would effectively carry out awareness raising activities with national stakeholders on the environmental damage caused by ODS, and how this

[382] Buxton, G.V. and R. Ciconkov. 2004. A Mid-Term Evaluation of UNEP's GEF-Sponsored Capacity Development and Institutional Strengthening Projects in Countries with Economies in Transition. Report prepared for UNEP-EO. 174pp. Page 77-78.

could be avoided with the use of substitutes to replace ODS. In regard to training, policy instruments would be established to facilitate the implementation of codes of good practice and a certification scheme for refrigeration and air-conditioning technicians. Custom officials would be advised on how to control imports and exports of ODSs and ODS-dependent equipment. A training infrastructure would be established for the ongoing training after the sub-project had been completed. ODS phase out targets would be achieved, bringing Lithuania into compliance with the Montreal Protocol.

8.8.4.2.2 Relevance

2331. The reduction and phase out of ODS in Lithuania is consistent with the objectives of the Vienna Convention and the Montreal Protocol, which *requires Parties to take appropriate measures in accordance with the provisions of this Convention and of those Protocols in force to which they are party to protect human health and the environment against adverse effects resulting or likely to result from human activities which modify or are likely to modify the ozone layer*[383].

2332. The GEF established in 1995 an Ozone Layer Depletion Focal Area in response to the Montreal Protocol. The Focal Area has the strategic objective of protecting human health and the environment by assisting countries to phase out their consumption and production of ODS, to prevent emissions of ODS, and to encourage the uptake of alternative technologies and practices according to a country's commitments under the Montreal Protocol. The financial interventions in the GEF Focal Area contribute to the return of the ozone layer to pre-1980 ozone levels, which is expected by 2065.

2333. Most recently, the dual capability of ODS to both reduce ozone and to have a detrimental impact on the climate have been described[384]. Global ODS consumption in 1989 was equivalent to about 9,200 million tonnes (9 Gt) CO_2-eq/year, which was reduced to about 1,870 million tonnes (1.8 Gt) CO_2-eq/year in 2007 as a result of ODS phase-out activities under the Montreal Protocol. This reduction of about 7 Gt CO_2-eq/year was at least three times greater than the Kyoto Protocol's reduction target (about 1-2 Gt CO_2-eq/year in 2008-2012), demonstrating that the global ODS reductions achieved so far have already yielded a larger climate benefit than the current Kyoto Protocol target.

2334. The reduction and phase out of ODS prior to Lithuania's accession to the EU was relevant for avoiding non-compliance with EU legislation on ODS that applied shortly after accession in May 2004.

2335. The actions taken by Lithuania to phase out ODS is therefore relevant to further protection of the ozone layer (Montreal Protocol), accession to the EU, and relevant to reducing the impact of radiative forcing of the climate (Kyoto Protocol).

8.8.4.2.3 Efficiency

2336. The cost-effectiveness as a means of determining '*efficiency*' was not relevant as this was an Institutional Strengthening project which is not normally subject to cost-effectiveness criteria. However, the project (including this sub-project) was reported to leverage $3,595,075 of in kind co-finance from the government of Lithuania for all of the sub-projects, which indicated that the government's environmental objectives were well-aligned with the objectives in this sub-project. The amount of co-finance that was specifically allocated to the Institutional Strengthening sub-project was not ascertainable.

2337. Efficiency can also be measured in terms of the size of the team in relation to its tasks and achievements. During the Project the NOU was had a staff of 1.5 FTE[385]. They were assisted by contracted and voluntary assistance from local experts, according to the budget and sub-project. The NOU used Institutional Strengthening funding to obtain short-term expertise not found in government for ozone protection activities that were being carried out by the MoE.

---

[383] Handbook for the Vienna Convention for the Protection of the Ozone Layer - 7th Edition (2006). Article 2: General Obligations.

[384] Velders, J.M., Andersen, S.O., Daniel, J.S., Fahey, D.W. and M. McFarland. 2007. The Importance of the Montreal Protocol in protecting climate. http://www.pnas.org/content/104/12/4814.abstract

[385] Full-Time-Equivalent.

2338. From 2002 until today, the NOU has been led by one person[386]. From April 2005, when the Institutional Strengthening programme concluded, the NOU has assigned 1.5 FTE to address issues on ODS. To leverage the effectiveness of the NOU with few staff, the MoE has put in place legislation that empowers other services (such as Customs officers and inspectors) to undertake work on ODS according to the legislative requirements, and to report the results of their activities. The NOU shares concerns and coordinates policy development with other units that work on climate and F-gases in order to harmonize requirements at the national level and to facilitate implementation by industry.

8.8.4.3 Assessment of sustainability of project outcomes

8.8.4.3.1 Financial resources

2339. The Institutional Strengthening Project Document was signed by UNEP on 3 May 1999. The intended completion date was May 2002, but this was extended to 31 March 2005 because of difficulties integrating the NOU into the MoE. The budget was $165,000 over the 3 year duration of the project. In May 2004, the midterm evaluators reported that about $70,000 of the budget remained which indicated that Lithuania maintained expenditure within the allocated budget.

2340. The Project was originally prepared by the Chief Engineer of the Atmospheric Protection Board within the Ministry of Environment (MoE), who became the International Project Coordinator (IPC) for the Project. Lithuania established a National Ozone Unit (NOU) in 2002, which was staffed by 3 Full-Time-Equivalents (FTE) until May 2005. The MoE was supported by a National Ozone Committee whose members were drawn from the Ministry of Industry and Trade (MIT), the Ministry of Agriculture (MoA), the Engineering Ecology Association, and the Technical University. Since 2002, the MoE has been the competent authority responsible for coordinating all activities on ozone layer protection in Lithuania, and the NOU has been financed from the central budget of the MoE.

2341. On 1 May 2004, Lithuania acceded to the European Union which resulted in continued access to funds to progress Lithuania's political and economic transition in areas that included transport, local development, energy, environment and finance.

2342. Lithuania also has had access to the EU's Cohesion Fund which is a structural instrument that helps Member States to reduce economic and social disparities and to stabilise their economies since 1994. The Cohesion Fund finances up to 85% of eligible expenditure of major projects involving the environment and transport infrastructure. This strengthens cohesion and solidarity within the EU. The least prosperous Member States whose gross national product (GNP) per capita is below 90% of the EU-average are eligible, which includes Lithuania. For the Cohesion Funds €15.9 billion (in 2004 prices) were available for the years 2004-2006, with more than half of the funding (EUR 8.49 billion) reserved for activities in Member States that most recently joined the EU.

2343. The risk of withdrawal of financial support from the MoE, for the 1.50 FTE in the NOU that are needed to support the ongoing activities related to ozone layer protection, was assessed as low. The activities related to ozone layer protection are financed by several ministries according to legislative requirements, and they have been integrated into the business of some organisations that can make a profit (from training personnel, for example). The risk of withdrawal of financial support amongst these ministries and organisations was also assessed as low. Overall, the finance for ozone layer protection was assessed as sufficient to support ongoing activities in this field.

8.8.4.3.2 Socio-political

2344. Several organisations assisted the MoE to implement legislation on ozone layer protection including the Customs Department (import and export of ODS to non-EU countries); the Labour Education and Training Service (LETS); the Ministry of Social Labour (MSL); and the Ministry of Education and Science (MES). LETS, MSL and MES collectively provided vocational education programmes, including the syllabus on refrigerant management. The MoE cooperated with the

[386] Head of Chemical Substances, Division of Environmental Quality, MoE. Also responsible for Strategic Approach to International Chemicals Management.

State Fire-Fighting and Rescue Service (halon and alternatives); the Civil Aviation Administration (halon); and the Maritime Authority (halon and alternatives).

2345. NGOs also provided assistance. For example, the National Refrigeration Association (NRA) is an NGO that was responsible for delivering training programmes during the Project on best practices in refrigerant management, and for certifying trainees.

2346. As described above, the initial GEF Project was prepared by the Chief Engineer of the Atmospheric Protection Board within the Ministry of Environment (MoE), who became the International Project Coordinator (IPC) for the Project. Lithuania established a National Ozone Unit (NOU) in 2002. During the Project, the IPC was assisted by the MoE and other local experts, contracted according to the budget and sub-project.

2347. Lithuania has put in place the structure that is responsive to the work on ozone layer protection. The range of organisations involved was assessed as sufficient to promote ongoing activities in this area because these organisations were staffed by personnel that had built up experience in activities related to the reduction and phase out of ODS, including training in best-practice management, alternatives that are not ozone depleting, and monitoring & reporting on consumption.

2348. The time to put this structure in place took longer than expected, and the project was delayed by about three years as a result because of difficulties establishing the NOU in 2002 within the MoE. Since that time, the government has continued to implement a multi-stakeholder approach that involves different services, administrations and ministries to undertake activities on monitoring and reporting ODS use, and training of technicians on best-practice ODS management. The requirements of the stakeholders are supported by legislation. In this way, the NOU itself can remain relative small with a strategic role, knowing that other stakeholders are involved in ozone layer protection.

8.8.4.3.3 Institutional framework and governance

2349. As described in paragraphs 2344 to 2346 above, the institutional framework and governance for ozone layer protection in Lithuania has been divided up between many organisations with responsibilities assigned to each organisation. Obtaining information on progress on ozone layer protection, as a result of the monitoring, coordination and reporting activities undertaken by the various organisations involved, depends mainly on the NOU that has staff of 1.50 FTE allocated to ozone layer protection activities. The staff of the unit were also required to allocate time to activities on climate (F-gases) and other issues.

2350. Information on activities carried out on ozone layer protection, including for example data on the quantity of ODS recovered, recycled and destroyed, was made available to the evaluation team for the purpose of this assessment. The performance of the institutional framework and governance in Lithuania was assessed as satisfactory.

8.8.4.3.4 Environmental

2351. There were few environmental risks that were assessed as potentially undermining this work in the future since all ODS has been phased out except those that are still permitted in the EU such as HCFCs and ODS for laboratory uses, and environmental legislation is in place to promote ongoing reduction and phase out activities.

2352. In a broader context, Lithuania harmonised as much as possible Lithuanian legislation on ODS with Regulation (EC) No 2037/2000 at the time Lithuania joined the EU on 1 May 2004[387]. A separate regulation on fluorinated gases came into force in 2006 in Lithuania[388]. The NOU is not responsible for work on F-gases, but cooperates with the personnel that are involved in F-gases.

2353. During the Project and since that time, Lithuania has continued to increase the institutional strength to address ozone layer protection issues across a range of ministries and departments. ODS legislation in Lithuania, which was established under the initiative taken by the NOU, now involves different authorities, services, departments and Ministries who monitor and report on

[387] LAND 50-2004: Ozone-Depleting Substances Management Requirements. In force from 1 May 2004. It implemented Regulation (EC) No 2037/2000 from the date that Lithuania joined the EC.

[388] This regulation transposed into national legislation Regulation (EC) No 842/2006 on F-gases.

the compliance of companies with ODS legislation. ODS is not addressed in isolation because of overlapping legislative requirements e.g. ODS found in electrical equipment must be addressed also through the WEEE legislation; and training on the best-practice management of ODS is often carried out on F-gases at the same time due to overlapping legislative requirements.

8.8.4.4 Catalytic role

2354. The key factors influencing catalytic action are *innovation, demonstration, replication* and *cooperation*. In this Institutional Strengthening sub-project, the single factor that influenced catalytic action was *cooperation*. The NOU initiated a diverse range of activities on ozone layer protection with other departments, ministries and organisations as described in the previous section. Later the requirement for these activities to continue was ensured by legislation. Therefore, this Institutional Strengthening sub-project was assessed as having a catalytic role to some extent.

8.8.4.5 Achievement of outputs and activities

8.8.4.5.1 Delivered outputs

2355. Paragraph 2329 above showed the basis for selecting the following achievement or performance indicators:

- Establishment and effective functioning of an NOU;
- Awareness raising activities completed;
- Alternative ODS technologies adopted by industry;
- Annual reports submitted to the Montreal Protocol on the consumption of ODS; and
- The phase-out of ODS consumption, in compliance with Montreal Protocol decisions.

2356. The delivered outputs are discussed for each of them.

8.8.4.5.1.1 Establishment and effective functioning of an NOU

2357. Lithuania established an NOU in 2002 within the MoE, which was staffed by 3 Full-Time-Equivalents (FTE) until May 2005. Since 2002, the MoE has been the competent authority responsible for coordinating all activities on ozone layer protection in Lithuania. The NOU has functioned effectively by cooperating with several organisations to implement legislation on ozone layer protection including the Customs Department (import and export of ODS to non-EU countries); the Labour Education and Training Service (LETS); the Ministry of Social Labour (MSL); and the Ministry of Education and Science (MES). LETS, MSL and MES collectively provided vocational education programmes, including the syllabus on refrigerant management. The MoE cooperated with the State Fire-Fighting and Rescue Service (halon and alternatives); the Civil Aviation Administration (halon); and the Maritime Authority (halon and alternatives). The National Refrigeration Association (NRA) is an NGO that was responsible for delivering training programmes during the Project on best practices in refrigerant management, and for certifying trainees. The NOU also held workshops and seminars with these and other organisations to raise awareness of ozone depletion and alternatives that could be implemented to avoid ozone depletion.

2358. An important task of the NOU was designing, drafting and submitting legislation on ODS for adoption by the Parliament. Prior to the establishment of the NOU in 2002, Lithuania introduced a permitting system for the import of ODS in 1994. In 1996, Lithuania's Action Plan[389] included an environmental protection goal to reduce ODS by introducing legislation from 1996 to 1998 that would control ODS import, export and use. Legislation in 1999 introduced the requirement for a license to store ODS; import quotas for ODS; a ban on the use of CFCs for use in new refrigeration and air-conditioning equipment, in aerosols and in the production of foam; and restrictions on the use of methyl bromide.

2359. Prior to the establishment of the NOU in 2002, Lithuania introduced a ban on new uses of ODS in 2003. Regional environmental protection departments were responsible for implementing and enforcing the legislation, by permits for use and inspections of companies. Environmental taxes

[389] Decree No I-1550. 25 September 1996. Lithuanian Republic Parliament

or subsidies were not introduced as import quotas became the most efficient legislative instrument for controlling ODS imported by only 3 importers. Legislation adopted in 2004 harmonised as much as possible Lithuanian legislation on ODS with Regulation (EC) No 2037/2000 at the time Lithuania joined the EU on 1 May 2004[390].

2360. The establishment of the NOU and the effective functioning of the NOU were assessed as having been delivered.

8.8.4.5.1.2 Awareness raising

2361. The Awareness campaign evolved out of the Project formulation process during which the major uses of ODS were defined, and the alternatives that could replace them. Gaps in knowledge were identified, and priorities were set for putting in place solutions over a 5 year period.

2362. The NOU undertook extensive Awareness Raising activities in Lithuania from 2002 to 2005 that targeted a diverse audience including the general public, school children, government departments, the fire service and companies involved in ODS. Awareness Raising activities included: Flood-lit posters for more than a year in the major cities; seminars to halon alternatives companies, ODS importers, distributors and users; booklets on the ozone layer for school children; information on alternatives posted on the website of the MoE; and, in cooperation with the NRA, a series of seminars delivered to companies on ODS.

2363. The NOU reported that the awareness campaign was essential for making companies aware of their legal obligations, and government departments and inspectors aware of their enforcement implications. The NOU reported that the GEF funding was essential for carrying out training on the detection of ODS and, importantly, the alternatives that would reduce the use of ODS. Once people were made aware of the problem, they were able to focus on the challenges of eliminating the use of ODS. The awareness programme was essential for creating a change in attitude at all levels of society in Lithuania.

2364. The awareness campaign was assessed as was assessed as one of the deliverables in the Institutional Strengthening sub-project that was delivered. However, there was neither a baseline established, nor performance indicators developed, that could be used to monitor the impact of the awareness raising campaign on the ozone layer recovery. Therefore, it was not possible to assess the impact of this awareness raising campaign.

8.8.4.5.1.3 Alternative ODS technologies adopted by industry

2365. Lithuania phased out 112 ODP-tonnes in the domestic refrigerator production facility, 245.6 ODP-tonnes in the aerosol company and 20 ODP-tonnes in the compressor facility. More than 16 ODP-tonnes of CFCs were recovered in 2000, which would have been available for servicing of equipment that still depended on CFCs. The provision of information on alternatives that assisted companies to phase out ODS technology was assessed as one of the deliverables in the Institutional Strengthening sub-project that was delivered.

8.8.4.5.1.4 Annual reports submitted to the Montreal Protocol on the consumption of ODS

2366. Lithuania submitted reports annually to the Ozone Secretariat in the Montreal Protocol from 1994 to 2003[391]. The submission of ODS consumption reports by Lithuania to the Secretariat (before 1 May 2004), and then directly to the European Commission for subsequent EC reports to the Secretariat on behalf of all Member States (after 1 May 2004), was assessed as one of the deliverables in the Institutional Strengthening sub-project that was delivered.

8.8.4.5.1.5 The phase-out of ODS consumption in compliance with Montreal Protocol decisions

2367. Lithuania's objective to phase out of 390 ODP-tonnes as a result of the Project was fully met. The success of the GEF Project had the benefit of assisting Lithuania to comply with the ODS legislative requirements of the EU, prior to accession to the EU on 1 May 2004. Lithuania eliminated 91% of the targeted ODS through the successful implementation of two investment sub-projects at Snaige and at (now called) Aerosol Baltija. The objectives were met without an

[390] LAND 50-2004: Ozone-Depleting Substances Management Requirements. In force from 1 May 2004. It implemented Regulation (EC) No 2037/2000 from the date that Lithuania joined the EC.

[391] Ozone Secretariat Data Centre. Last update 23 December 2009. Lithuania.

extensive Awareness Campaign.

2368. The Institutional Strengthening sub-project enabled Lithuania to also comply with Decision X/25 of the Parties to the Montreal Protocol. The consumption of Annex A and B substances was reduced by 87% from 1996 levels by 1 January 2000 (86% was required in Decision X/25). Lithuania reported zero ODS consumption for CFCs, carbon tetrachloride and methyl chloroform in 2001.

2369. In response to the Parties request for greater emphasis on recovery and recycling to meet the servicing needs, Lithuania with the financial assistance of the GEF deployed recovery and recycling equipment to 16 companies. The amount recovered would have helped to address the CFC servicing requirements at the time.

2370. The phase out ODS consumption, in compliance with a Montreal Protocol decision affecting Lithuania, was assessed as one of the deliverables in the Institutional Strengthening sub-project that was delivered by Lithuania.

8.8.4.5.2 Awareness about ODS, ODS substitute technology, and strengthening of institutional capacities to achieve the ODS phase-out

2371. The extensive work in Lithuania to increase the awareness of ozone layer depletion was described in Section 8.8.4.5.1.2 above. The work on ODS substitute technology was focused on three enterprises and described in Section 8.8.6 (aerosol manufacture) and Section 8.8.7 (domestic refrigerator manufacture) and Section 8.8.8 (compressor manufacture).

2372. The strengthening of institutional capacities to achieve the ODS phase-out occurred was mainly due to cooperation between the NOU and the Customs Department (import and export of ODS to non-EU countries); the Labour Education and Training Service (LETS); the Ministry of Social Labour (MSL); and the Ministry of Education and Science (MES). The MoE/NOU also cooperated with the State Fire-Fighting and Rescue Service (halon and alternatives); the Civil Aviation Administration (halon); and the Maritime Authority (halon and alternatives). The NOU cooperated with the National Refrigeration Association (NRA), an NGO that was responsible for delivering training programmes during the Project on best practices in refrigerant management, and for certifying trainees. The NOU also held workshops and seminars with these and other organisations to raise awareness of ozone depletion and alternatives that could be implemented to avoid ozone depletion.

2373. The roles of the Ministry of Finance (in relation to equipment import by Customs), and the National Refrigeration Association, are discussed further below in Section 8.8.5 *LIT/97/G32 National programme for recovery and recycling of ODS refrigerants (UNDP/UNOPS)*.

8.8.4.5.3 Authority / credibility, necessary to influence policy and decision-makers

2374. The NOU in Lithuania has the authority / credibility, necessary to influence policy and decision-makers, which was shown mainly through the NOUs ability to:

- Assist in drafting important legislation that reduces and eliminates ODS;
- Establish an effective recovery and recycling programme for ODS;
- Coordinate the training of technicians and customs officers;
- Assist industry with information on alternatives to ODS; and
- Undertake awareness raising programmes on ozone layer depletion and alternatives.

2375. This credibility has been established by an NOU within the MoE that cooperated with a diverse range of government bodies in Lithuania that were involved in ODS (see paragraph 2357 above for further description of these bodies). The NOU was assessed as well-qualified to carry out tasks on ODS reduction and phase out due to a combination of political, technical and administrative expertise.

8.8.4.6 Assessment of monitoring and evaluation systems

8.8.4.6.1 Monitoring and evaluation design

2376. The GEF specified that *project monitoring would be performed by UNEP/UNDP and the cost for this activity would be included in the budget. A standard evaluation would be performed, except*

in the case that an in-depth evaluation was required by the GEF. In that case, independent consultants would be hired and sent to Latvia. Consultancy fees and travel costs would need to be obtained in addition to the amounts requested in the project.

2377. Apart from this statement, there was no specific design for monitoring and evaluation.

8.8.4.6.2 Monitoring and evaluation plan implementation

2378. UNEP's 'Risk Factor Table'[392] was evaluated as evidence of the implementation of the evaluation plan.

2379. UNEP scored Lithuania as low risk for the Management Structure (*stable with role and responsibilities clearly understood, clear stable management structure with open communication and collaboration across public and private sector*); Work flow and implementation (*the project is maintaining its planned work flow, and the NOU has followed the Work Plan and is completing activities ahead of schedule*); Budget and fund management (*Progressing according to budget, funds are wisely spent and correctly and transparently accounted for and accounting kept up to date*); Reporting (*progress reported comprehensively and very much on time. Reports contain critical analysis*); Communication and leadership (*the NOU has access to government officials from across a range of ministries and the coordinator as Head of Division of the Technology Unit, Department of Environment Protection Ministry of Environment, as good access to other high-level persons in the government*); Sustainability (*EC conformity ensures sustainability*); Sources of information (*follows TEAP recommendations*); and Political support (*full political support*). The external risks were also assessed by UNEP as low risk – *political stability, the economy is improving, and the environmental conditions were safe and predictable.*

2380. UNEP scored Lithuania as medium risk for Stakeholder Involvement because ENGO involvement was lacking. UNEP acknowledged there was also no known culture of ENGO activity in Lithuania.

8.8.4.6.3 Budgeting and Funding for monitoring and evaluation activities

2381. There was no information available on the budgeting and funding of the monitoring and evaluation activities.

8.8.4.6.4 Long-term monitoring

2382. Article 7 "*Reporting of data*" mandates Parties to the Montreal Protocol to report by 30 September each year on their consumption and production of ODS in the previous year. Decision XV/15 in 2003 encouraged Parties to forward data on consumption and production to the Secretariat as soon as the figures became available, and preferably by 30 June each year, rather than 30 September in order to facilitate the work of the Protocol's Implementation Committee. The Secretariat reported in 2009 that most Parties are able to comply with the June requirement.

2383. Data reporting on consumption is the most important action on long-term monitoring and a '*litmus test*' of progress in the phase out of ODS and the sustainability of the phase out. The Implementation Committee has not remarked on any aspects of data reporting by Lithuania, which suggested that reporting had been timely and accurate. Data reporting, and the infrastructure necessary for this, is expected to continue to be included in the annual budget by the government of Lithuania for work assigned to the NOU.

8.8.4.7 Assessment of processes that affected attainment of project results

8.8.4.7.1 Preparation and readiness

2384. The Institutional Strengthening Project Document was signed by UNEP on 3 May 1999. The intended completion date was May 2002, but this was extended to 31 March 2005 because of difficulties integrating the NOU into the MoE. The NOU was established in 2002. Without the NOU, the project objectives and timeline for achieving them were not practical as the project management arrangements (financial, logistical) were not in place.

2385. The evaluation team assessed Lithuania as unprepared and unready for this sub-project on Institutional Strengthening.

[392] Dated 15 September 2005

8.8.4.7.2 Country commitment and motivation

2386. Once the NOU was established in 2002, Latvia showed that it was committed and motivated by establishing, as examples, an effective ODS recovery and recycling programme; by coordinating the training of technicians and Customs officers; and by undertaking awareness raising programmes which attracted the interest of the local media; and by organising meetings with key stakeholders.

2387. However, the single largest factor that committed and motivated Lithuania to ozone layer protection was the requirement to harmonise legislation on ODS with the EU, and to become compliant with EU phase out requirements for ODS which were more strict than the Montreal Protocol, prior to acceding to the EU on 1 May 2004.

2388. Once Lithuania became an EU Member State, the European Commission required Member States including Lithuania to submit annual reports on emissions control of ODS (minimum qualification requirements), the use of MB and alternatives, critical uses of halons, the use of CFCs in medical products that control asthma, the phase out of halon on ships and in aircraft, and the quantity of ODS recovered, reclaimed, recycled and destroyed.

2389. The Lithuanian government is committed to undertake activities that continue to reduce ODS, and to provide information to the European Commission, in compliance with EU regulations and directives. Member States continue to undertake these activities because of a desire to comply with national environmental objectives, which also has the benefit of avoiding infringement action which has been instigated in the past when a Member State has not complied with the requirements of the EU legislation.

2390. Lithuania therefore put in place the structure that it believed was able to be responsive to the EU requirements on ozone layer protection. The time to put this structure in place took longer than expected, and the project was delayed by about three years as a result.

8.8.4.7.3 Stakeholder involvement

2391. The MoE / NOU was responsible for the development and implementation of ODS policies, legislation, regulation and any other policies and control measures; the NOU involved a range of stakeholders, including the Customs Department (import and export of ODS to non-EU countries); the Labour Education and Training Service (LETS); the Ministry of Social Labour (MSL); and the Ministry of Education and Science (MES). The MoE/NOU also involved the State Fire-Fighting and Rescue Service (halon and alternatives); the Civil Aviation Administration (halon); and the Maritime Authority (halon and alternatives). The NOU involved the National Refrigeration Association (NRA), an NGO that was responsible for delivering training programmes during the Project on best practices in refrigerant management, and for certifying trainees. The NOU also involved these and other organisations in workshops and seminars that aimed to raise awareness of ozone depletion and alternatives that could be implemented to avoid ozone depletion. In addition, the NOU involved administrative staff, national and international consultants, and NGOs involved in environmental protection.

2392. The partnerships formed as a result of the involvement of these stakeholders was assessed as creating effective stakeholder participation to progress the work of the NOU and the MoE in ozone layer protection.

8.8.4.7.4 Financial planning

2393. In April 2004, UNEP arranged a special 3-day meeting in Paris to bring together DTIE staff, the project FMO from UNEP DGEF and the country NOU representatives to discuss reports financial and progress reports that had yet to be submitted, budget revisions and disbursements. This workshop also provided NOUs with information to improve the quality and timeliness of data reporting, which had delayed funding disbursements and completion of activities.

2394. In 2005 (as an example), UNEP reported that it was satisfied with the Financial Reports that were prepared and submitted to UNEP by the NOU from Lithuania in a timely and efficient manner. The funds for the project were reported by UNEP to have been handled extremely effectively by Lithuania, with drawdown on project funds matching progress made in the project. UNEP also reported good communication with the UNEP DGEF Task Manager on financial issues as they arose.

8.8.4.7.5 UNEP supervision and support

2395. UNEP was the lead agency that prepared the "*Lithuania Country Programme*" and in the implementation of Institutional Strengthening and Capacity Building, awareness raising and training activities. UNEP DTIE (Paris) was the responsible supervising organisation from the inception of the NOU in Estonia in 2000 until 2003. This period was the period of initiation and learning for the newly formed NOU. UNEP GEF (Nairobi) took over the supervisory role from 2004 onwards.

2396. UNEP had to wait several years for the NOU to be established in 2002 after the project was approved, in order to supervise and support the NOU on the Institutional Strengthening activities. Once established, UNEP established a good working relationship with Lithuania that covered work plan implementation, progress reports and financial reporting.

8.8.4.7.6 Co-financing and project outcomes & sustainability

2397. The GEF budget for all of the ODS phase out activities in Lithuania was $4,759,103. In addition, Lithuania declared $3,595,075 as in-kind co-finance from the beginning of the project for government staff costs, as well as for the provision of office space, transport and communications. The total budget for all of the ODS phase out activities in Lithuania that included GEF funding and in-kind co-finance was therefore $8,354,178.

2398. The budget for the Institutional Strengthening sub-project was a total of $165,000 over the 3 year duration of the project. In May 2004, the midterm evaluators reported that about $70,000 of the budget remained which indicated that Lithuania maintained expenditure within the allocated budget. The amount of in-kind co-finance that contributed to the Institutional Strengthening sub-project was not declared. However, it is reasonable to assume that the co-finance for the Institutional Strengthening sub-project was a significant part of the $3,595,075 declared by Lithuania for the whole programme, as this sub-project was the main activity of the NOU and other government bodies.

2399. A significant level of in-kind co-finance demonstrated the commitment of Lithuania to the sub-project and probably increased the Lithuania's "ownership" of the programme. Increased ownership has been shown in other projects to promote sustainability, since the government commitment is greater than when there is no financial commitment.

2400. The significant level of co-finance by Lithuania was also an acknowledgement to provide long term stability to the programme, since the results of the ODS monitoring were required to be submitted annually to the European Commission in accordance with Latvia's responsibilities as a Member State of the EU after May 2004.

2401. For these reasons, the evaluation team assessed Lithuania's significant level of co-finance of the sub-project on Institutional Strengthening as a significant factor that helped to promote the sustainability of the programme.

8.8.4.7.7 Project implementation delays and impact on project outcomes & sustainability

2402. The project implementation delay of about three years was assessed as not having a significant impact on the sustainability of the ODS phase out programme in Lithuania. This was because Lithuania had already implemented important legislation on ODS prior to the NOU being established, and because harmonisation of Lithuania's legislation on ODS was of paramount importance when acceding to the EU. Lithuania was not in a position to let the 'hard deadline' of EU accession slip passed the due date of May 2004.

8.8.4.8 Sub-Project Rating

GF/2110-99-02 Institutional Strengthening for the Implementation of the Montreal Protocol in Lithuania (UNEP)		
Criterion	**Evaluator's Summary Comments**	**Evaluator's Rating**
Attainment of project objectives and	See comments below	S

GF/2110-99-02 Institutional Strengthening for the Implementation of the Montreal Protocol in Lithuania (UNEP)		
Criterion	**Evaluator's Summary Comments**	**Evaluator's Rating**
results Sub criteria (in yellow below)		
Effectiveness	Started about 3y later than expected; satisfactory completion of: NOU establishment; legislation implementation; training in best-practice ODS management; Customs officials training; awareness raising programme; ODS phase out targets achieved	S
Relevance	Conversion to non-ODS technology, awareness raising programmes and other activities shown above are consistent with minimising the detrimental effect of ODS on the ozone layer	HS
Efficiency	A relatively small team in the NOU leveraged national resources to coordinate the activities on ozone layer protection in a cost-effective and timely manner	MS
Sustainability of Project outcomes (overall rating) Sub criteria (in yellow below)	See comments below	S
Financial	Most likely delivered within budget; EU monitoring and reporting requirements necessitate ongoing financial support for ODS activities	S
Socio-Political	Good socio-political support from government and NGOs that promotes sustainability of ozone layer protection	S
Institutional framework and governance	Many diverse government organisations involved in monitoring and reporting ODS; good institutional framework and governance; data made available	HS
Environmental	No environmental risks that could potentially undermining the work achieved so far on ODS; ODS no longer available for many uses from the past	HS
Achievement of outputs and activities		S
Monitoring and Evaluation (overall rating) Sub criteria (in yellow below)	See below	
M&E Design	No specific design for monitoring and evaluation	MS

GF/2110-99-02 Institutional Strengthening for the Implementation of the Montreal Protocol in Lithuania (UNEP)		
Criterion	**Evaluator's Summary Comments**	**Evaluator's Rating**
M&E Plan Implementation (use for adaptive management)	UNEP implemented the risk factor approach which identified most activities as low risk, and just two as medium risk	S
Budgeting and Funding for M&E activities	Not determinable from the documentation provided	MS
Catalytic Role	No categorisation required	
Preparation and readiness	Lithuania as unprepared and unready for this sub-project on Institutional Strengthening	U
Country commitment and motivation*	Not present in the beginning, but after the NOU was established and operational the country commitment and motivation was much higher	S
Stakeholder involvement	Effective stakeholder participation that helped to progress the work of the NOU and the MoE in ozone layer protection	S
Financial planning	Adequate with good communication between UNEP and Lithuania	S
UNEP supervision and support**	UNEP had a good working relationship with Lithuania that covered work plan implementation, progress reports and financial reporting	S
Overall Rating		S

Highly Satisfactory (HS); Satisfactory (S); Moderately Satisfactory (MS); Moderately Unsatisfactory (MU); Unsatisfactory (U); Highly Unsatisfactory (HU);
*Motivation replaced TOR '*driveness*'; **Support replaced TOR 'backshopping'

8.8.5 LIT/97/G32 National programme for recovery and recycling of ODS refrigerants (UNDP/UNOPS)

8.8.5.1 Introduction

2403. The project established a national programme for the recovery and recycling of CFC refrigerant used in air-conditioning and refrigeration equipment in Lithuania. This was achieved through the supply of recovery and recycling equipment to Lithuania, providing funds for workshops that delivered training to technicians in the best-practice use of the recovery and recycling equipment supplied, and providing funds to establish three recovery, recycling and reclamation centres.

2404. The Project Document was signed by UNDP on 5 May 1998 and the project was completed in May 2001. The quantities of CFCs recovered, recycled and destroyed were reported by Lithuania and compared to the amount targeted of 9.72 ODP-tonnes. The GEF budget was $165,457 over a 2 year period. There was no co-finance declared by Lithuania toward the cost of this sub-project.

8.8.5.2 *Attainment of objectives and planned results*

8.8.5.2.1 Effectiveness

2405. There were no specific achievement or performance indicators that were developed for this project. Effectiveness could be evaluated by assessing:

- The quantity of equipment supplied for recovery and recycling of ODS;
- The number of servicing enterprises and servicing centres that received the equipment;
- Training of technicians in best-practice ODS recovery and recycling;
- The amount of ODS recovered, recycled and destroyed as a result of the sub-project.

2406. As a result of the implementation of this sub-project, there was more recovery and recycling activity in the service centres that service air-conditioning and refrigeration equipment, the technical skills of technicians in Lithuania were improved, and data were made available on the amount of ODS recovered, recycled and destroyed.

2407. The achievement of outputs and activities by Lithuania in this sub-project on recovery and recycling of ODS, as measured against these performance indicators, are provided in Section 8.8.5.5.1 "*Delivered outputs*" below.

2408. On this basis, and also in consideration of the deliverables described in Section 8.8.5.5.1, the effectiveness of the ODS recovery and recycling sub-project was assessed as satisfactory.

8.8.5.2.2 Relevance

2409. Reduced emissions of ODS in Lithuania as a result of the implementation of this ODS recovery and recycling programme is consistent with the objectives of the Vienna Convention and the Montreal Protocol, which *requires Parties to take appropriate measures in accordance with the provisions of this Convention and of those Protocols in force to which they are party to protect human health and the environment against adverse effects resulting or likely to result from human activities which modify or are likely to modify the ozone layer*[393].

2410. The GEF established in 1995 an Ozone Layer Depletion Focal Area in response to the Montreal Protocol. The Focal Area has the strategic objective of protecting human health and the environment by assisting countries to phase out their consumption and production of ODS, to prevent emissions of ODS, and to encourage the uptake of alternative technologies and practices according to a country's commitments under the Montreal Protocol. The financial interventions in the GEF Focal Area contribute to the return of the ozone layer to pre-1980 ozone levels, which is expected by 2065.

2411. Most recently, the dual capability of ODS to both reduce ozone and to have a detrimental impact on the climate have been described[394]. Global ODS consumption in 1989 was equivalent to about 9,200 million tonnes (9 Gt) CO_2-eq/year, which was reduced to about 1,870 million tonnes (1.8 Gt) CO_2-eq/year in 2007 as a result of ODS phase-out activities under the Montreal Protocol. This reduction of about 7 Gt CO_2-eq/year was at least three times greater than the Kyoto Protocol's reduction target (about 1-2 Gt CO_2-eq/year in 2008-2012), demonstrating that the global ODS reductions achieved so far have already yielded a larger climate benefit than the current Kyoto Protocol target.

2412. The implementation of the recovery and recycling programme prior to Lithuania's accession to the EU was relevant for avoiding non-compliance with EU legislation on ODS that applied shortly after Lithuania's accession to the EU in May 2004. The EU required Member States, *inter alia*, to take steps to promote the recovery, recycling, reclamation and destruction of controlled substances and to assign to users, refrigeration technicians or other appropriate bodies responsibility for ensuring compliance[395]. Member States were required to report to the Commission annually on the systems established to promote the recovery of used controlled substances, including the facilities available and the quantities of used controlled substances

---

[393] Handbook for the Vienna Convention for the Protection of the Ozone Layer - 7th Edition (2006). Article 2: General Obligations.

[394] Velders, J.M., Andersen, S.O., Daniel, J.S., Fahey, D.W. and M. McFarland. 2007. The Importance of the Montreal Protocol in protecting climate. http://www.pnas.org/content/104/12/4814.abstract

[395] Regulation (EC) No 2037/2000 Art 16 (5): Recovery of used controlled substances

recovered, recycled, reclaimed or destroyed. The EU required Member States to take all precautionary measures practicable to prevent and minimise any leakages of controlled substances[396].

2413. The actions taken by Lithuania to phase out ODS is therefore relevant to further protection of the ozone layer (Montreal Protocol), accession to the EU, and relevant to reducing the impact of radiative forcing of the climate (Kyoto Protocol).

8.8.5.2.3 Efficiency

2414. The cost-effectiveness of this sub-project was $17.02 ODP-kg per year, based on a *targeted* phase out of 9.72 ODP-tonnes and a sub-project cost of $165,457.

2415. This cost-effectiveness of $17.02 ODP-kg per year was almost twice as expensive as the average cost-effectiveness of $9.60 ODP-kg per year reported for MLF-funded projects on refrigeration recovery and recycling that were implemented in 25 developing countries[397].

2416. Lithuania reported 16,195 kg of CFCs recovered in 2000 and 2001 (there was no report for 1999), which coincided with the term of the recovery and recycling sub-project (see Table 50 on page 464). The cost-effectiveness was $20.43 ODP-kg per year, based on an *actual* phase out of 8.10 ODP-tonnes per year (over 2 years) and a sub-project cost of $165,457. The cost-effectiveness of $20.43 ODP-kg based on the reported phase out of CFCs was more than twice as expensive as the average cost-effectiveness of $9.60 ODP-kg per year of MLF-financed recovery and recycling projects that were implemented in 25 developing countries.

8.8.5.3 Assessment of sustainability of project outcomes

8.8.5.3.1 Financial resources

2417. The *Certificate of Completion* and the *Hand Over Protocol* were issued after UNDP's mission to Lithuania in May 2001. The sub-project was assessed as completed on that date. The budget was $165,457 over the 3 year duration of the project. There was no report available that showed expenditure *versus* budget.

2418. Since 2002 when the NOU was established, the NOU has been financed from the central budget of the MoE because this Ministry is the competent authority responsible for coordinating all activities on ozone layer protection. The funding by the MoE pays for the compilation of data on the quantities of ODS recovered, recycled and destroyed each year, as this report was mandatory under Regulation (EC) 2037/2000.

2419. After May 2004 when Lithuania acceded to the EU, as a new Member State Lithuania had access to funds to progress Lithuania's political and economic transition in areas that included transport, local development, energy, environment and finance. In addition, Lithuania had access to the EU's Cohesion Fund which is a structural instrument that helps Member States to reduce economic and social disparities and to stabilise their economies. The Cohesion Fund made available to all Member States €15.9 billion (in 2004 prices) in 2004-2006, but more than half of the funding (EUR 8.49 billion) was reserved for activities in Member States that most recently joined the EU such as Lithuania.

2420. An important aspect of the recovery and recycling programme is the training of technicians. Training programmes were prepared by the vocational education and training establishments and registered in the Register of Programmes for Studies and Training. The Lithuanian Labour Market Training Authorities issued certificates to technicians and managers that passed the course. Trainees paid about $268 to attend each 40h course, which consisted of 15 hours theory and 25 hours of practical tuition. Self-funding, rather than government funding, can be more sustainable especially when the companies value the training that is provided. This is discussed further in Section 8.8.5.5.1 "*Delivered outputs*" below.

2421. The combination of funding from government, private (companies / technicians) and EU was assessed in this evaluation as likely to be sufficient to sustain activities in Lithuania on ODS recovery and recycling, and the training of technicians in best-practice ODS management.

---

[396] Regulation (EC) No 2037/2000 Art 17 (1): Leakages of controlled substances

[397] MLF. 2000. Desk Study on Recovery and Recycling Projects. UNEP/OzL.Pro/ExCom/31/18. Data in Annex II analysed by Touchdown Consulting Brussels.

8.8.5.3.2 Socio-political

2422. Several organisations assisted the MoE/NOU to implement this sub-project on recovery and recycling including the Customs Department (for the import of recovery and recycling equipment); the Labour Education and Training Service (LETS); the Ministry of Social Labour (MSL); and the Ministry of Education and Science (MES). LETS, MSL and MES collectively provided vocational education programmes, including the syllabus on refrigerant management. NGOs also provided assistance. For example, the National Refrigeration Association (NRA) is an NGO that was responsible for delivering training programmes during the Project on best practices in refrigerant management, and for certifying trainees. During the course of the sub-project, the NOU was assisted by local experts.

2423. Payment for the cost of the training courses will be a challenge for many companies and trainees that are struggling to survive the global economic crisis. This was assessed as the most likely cause of trainees and companies deferring training in best-practice ODS recovery and recycling. On the other hand, legislation on ODS and F-gases requires trained technicians that have up-to-date qualifications, and therefore this is most likely to be seen by companies a cost that has to be met when for work that involves air conditioning and refrigeration equipment.

2424. Lithuania has put in place the structure that can progress the work on the recovery and recycling of ODS. The range of organisations involved was assessed as sufficient to promote ongoing activities in this area because these organisations were staffed by personnel that had built up experience in activities related to the reduction and phase out of ODS, including training in best-practice management, and monitoring & reporting on the amounts of ODS recovered, recycled and destroyed annually.

8.8.5.3.3 Institutional framework and governance

2425. As described in paragraphs 2422 and 2423 above, the institutional framework and governance for ozone layer protection in Lithuania has been divided up between many organisations with responsibilities assigned to each organisation. Continued use of the recovery and recycling equipment and training on best-practice ODS recovery and recycling depended mainly on actions and follow up by the NOU. The NOU has staff of 1.50 FTE allocated to ozone layer protection activities that are not 100% dedicated to ozone layer protection as they assist other colleagues on climate (F-gases) and other issues.

2426. For this evaluation, information was provided by Lithuania on the quantity of ODS recovered, recycled and destroyed. The performance of the institutional framework and governance in Lithuania on recovery and recycling was assessed as satisfactory and it was assessed as likely to promote the sustainability of the recovery and recycling operations.

8.8.5.3.4 Environmental

2427. There were few environmental risks that were assessed as potentially undermining this work in the future since all ODS has been phased out except those that are still permitted in the EU such as HCFCs and ODS for laboratory uses, and environmental legislation is in place to promote ongoing reduction and phase out activities. Indeed, the largest remaining use is the use of HCFCs in refrigeration and air-conditioning. Under Regulation (EC) 1005/2009 which came into force recently on 1 January 2010, only recovered and recycled HCFCs can be used to refill equipment that operates on these gases, and only until 31 December 2014 after which such refilling becomes illegal. Moreover, recovered HCFCs can only be recycled into equipment by the company that recovered them, and they cannot be placed on the market. The amount of HCFCs that are potentially available for such recovery and recycling has not been quantified in the EU.

2428. In a broader context, Lithuania harmonised as much as possible Lithuanian legislation on ODS with Regulation (EC) No 2037/2000 at the time Lithuania joined the EU on 1 May 2004[398]. A separate regulation on fluorinated gases came into force in 2006 in Lithuania[399]. The NOU is not responsible for work on F-gases, but cooperates with the personnel that are involved in F-gases.

---

[398] LAND 50-2004: Ozone-Depleting Substances Management Requirements. In force from 1 May 2004. It implemented Regulation (EC) No 2037/2000 from the date that Lithuania joined the EC.

[399] This regulation transposed into national legislation Regulation (EC) No 842/2006 on F-gases.

ODS is not addressed in isolation because of overlapping legislative requirements e.g. ODS found in electrical equipment must be addressed also through the WEEE legislation; and training on the best-practice management of ODS is often carried out on F-gases at the same time due to overlapping legislative requirements.

2429. In Lithuania, ODS waste is classified as 'hazardous' and subject to EU law applicable to its recovery, transport and disposal[400]. All companies that manage ODS waste must also be licensed, and technicians must be trained and certified. Legislation adopted in 2006 specified that from 1 January 2008 only qualified personnel such as technicians and managers were permitted to service ODS contained in refrigeration & air-conditioning equipment, and heat pumps[401]. Lithuania transposed EC legislation on waste into national legislation[402].

2430. The legislative environment that promoted the recovery and recycling of HCFCs and other ODS was assessed as likely to promote the continuation of the recovery and recycling programme, as well as the training of technicians in best-practice ODS recovery and recycling.

8.8.5.4 Catalytic role

2431. The key factors influencing catalytic action are *innovation, demonstration, replication* and *cooperation*. In this recovery and recycling sub-project, the single factor that influenced catalytic action was *replication*.

2432. The MoE, with the assistance of the National Refrigeration Association, distributed the recovery and recycling equipment to 16 companies, including the reclamation units to three Reclamation Centres for processing CFC-12. In 2009, the NOU reported 107 companies that used refrigerants for servicing refrigeration and air conditioning equipment.

2433. The National Refrigeration Association reported that enterprises that did not receive the equipment as part of the sub-project purchased their own because the recovery and recycling equipment extended the period for the use of CFCs, and because the equipment was necessary for them to obtain certification. The National Refrigeration Association did not know the number of companies that purchased their own equipment.

2434. The sub-project on recovery and recycling was assessed as having some catalytic influence, but the number of companies that the sub-project encouraged to purchase recovery and recycling equipment could not be quantified.

8.8.5.5 Achievement of outputs and activities

8.8.5.5.1 Delivered outputs

2435. Paragraph 2405 above showed the basis for selecting the following achievement or performance indicators:

- The quantity of equipment supplied for recovery and recycling of ODS;
- The number of servicing enterprises and servicing centres that received the equipment;
- Training of technicians in best-practice ODS recovery and recycling;
- The amount of ODS recovered, recycled and destroyed as a result of the sub-project.

2436. The delivered outputs are discussed for each of these performance indicators.

8.8.5.5.1.1 Equipment supplied for the recovery and recycling of ODS in Lithuania

2437. The Project financed 50 recovery machines, 3 recovery and recycling machines and 3 reclamation units. UNDP was responsible for tendering and procuring the equipment.

2438. According to the MoE records, recovery and recycling of ODS was successful as the machines were used when repairing and dismantling refrigeration equipment. In contrast, the reclamation machines were little used because the price of new ODS was low, technicians did not trust the quality of the reclaimed ODS, there was an administrative burden for enterprises that handled contaminated ODS as it was categorised as 'waste', and the reclamation machines could not

[400] Regulation (EC) No 1013/2006 on the shipment of waste.
[401] Resolution 695 of 10 July 2006. State certificate required by personnel that handle refrigerants (F-gas, ODS).
[402] Order No. D1-190 of the Minister of Environment dated 30 March 2007.

reclaim blends of refrigerants which were common at the time.

8.8.5.5.1.2 Servicing enterprises and servicing centres that received the equipment

2439. The MoE with the assistance of the National Refrigeration Association distributed them to 16 companies, including the reclamation units to three Reclamation Centres for processing CFC-12. The companies that received the equipment were selected on the basis of a survey that determined the extent of their servicing activities.

2440. Thirteen of these companies are still using the machines in 2009. The machines were retrieved from two companies that were not actively using the machines, and they were redistributed to the other companies. The MoE, in collaboration with the National Refrigeration Association, is currently considering assigning 3 more machines to other companies in order to maximise their use. Spare parts for the machines were purchased with the residual Project funds. When the parts were depleted, the companies purchased their own.

2441. The Reclamation Centre was not supplied with equipment to recover halon. Instead, halon decommissioned in Lithuania was intended to be shipped to the halon Regional Halon Bank in Estonia. Lithuania identified 23 companies and institutions that use halon. The NOU supplied relevant information on the decommissioning requirements for halon to these companies and institutions. So far, one shipment of halon has been shipped from Lithuania to the Regional Halon Bank in Estonia.

8.8.5.5.1.3 Training of technicians in best-practice ODS recovery and recycling

2442. In order to receive the equipment, personnel from the 16 companies that were due to receive the equipment were required by the government to participate in seminars on refrigerant management.

2443. There were 132 technicians trained from 1993 to 1996 in service enterprises, and 90 technicians in from industrial enterprises. By the end of 1996, there were 29 personnel in service and industrial enterprises that had not been trained. The evaluation team noted that these personnel were trained in best-practice ODS recovery and recycling *before* the sub-project commenced. During the term of the sub-project, there were two seminars that provided practical demonstrations on the use of the equipment for recovery and recycling. After the project was completed and in 2008, National Refrigeration Association trained 50 trainees on refrigerant management.

2444. Training programmes were prepared by the vocational education and training establishments and registered in the Register of Programmes for Studies and Training. The Lithuanian Labour Market Training Authorities issued certificates to technicians and managers that passed the course. Trainees paid about $268 to attend each 40h course, which consisted of 15 hours theory and 25 hours of practical tuition.

2445. Not all trainees passed and about 5% of them failed either the theory or the practice and had the option of re-taking the course. Certification was valid for 5 years. The National Refrigeration Association reported that there were no unqualified technicians working in Lithuania. Unqualified workers and their managers were penalised under national legislation when found working without qualifications. The National Refrigeration Association reported that the penalty deterred companies from employing unqualified staff.

2446. The training was assessed as effective and sustainable, due mainly to the legislative requirements for training and the involvement of the National Refrigeration Association in the training courses.

8.8.5.5.1.4 The amount of ODS recovered, recycled and destroyed

2447. Recovery and recycling is mandatory under Lithuanian legislation. There are penalties established for deliberate emissions of ODS and for failing to report on ODS recovered and recycled. The MoE also sent letters to the refrigeration servicing companies and regional inspectors that explained the requirement to recover ODS, and the penalties for not doing so.

2448. There are currently 107 companies that use refrigerants for servicing refrigeration and air

conditioning equipment. These companies are required by legislation[403] to complete a Form annually (for use in the previous year) on the name of the substance, the source (import or EC), the quantity at the beginning of the year, the quantity added, the intended use, the amount recycled/regenerated/destroyed, and the amount remaining at the end of the year. Legislation in place mandates all companies to also report annually to the MoE on the amounts recovered, recycled, reclaimed and destroyed[404].

2449. The quantities of recovered and recycled ODS are shown in Table 50. There were no reports of reclaimed ODS. Table 50 shows that during the period of the project (1999 to 2001) there were about more than 16 tonnes of CFCs recovered and almost 7 tonnes of HCFCs. The quantity of CFCs recovered of 8.10 ODP-tonnes per year was about 17% less than the target in the recovery and recycling sub-project of 9.72 ODP-tonnes per year.

2450. In 2005 and 2006, the quantity of CFCs recovered was very small, and zero in 2007. This suggested that the bulk of the CFCs were recoverable at the time of the sub-project on recovery and recycling. The quantity of HCFCs recovered and recycled has continued to increase over the years and accounting for the majority of the ODS recovered and recycled in 2007.

Table 50: Quantities of ODS recovered and recycled in Lithuania in 2000, 2005, 2006 and 2007 (kg)

	2000-2001		2005		2006		2007	
	Recov.	Recy.	Recov.	Recy.	Recov.	Recy.	Recov.	Recy.
CFC-12	16,195		414	0	527	0	0	0
CFC-12 & CFC-11			0	0	0	0	5,837	0
HCFC-22	6,978		7,178	6,760	5,346	1,992	8,588	3,978
HCFC-124			12	12	12	0	171	171
HCFC-142b			8	8	8	0	101	101
Halon 1301			0	0	0	0	334[1]	0
Halon 2402			0	0	1,033[2]	0	1,727[1]	12
Total			7,612	6,780	6,926	1,992	16,513	4,017

* April 2000 to January 2001; blank = no report; Halon 2402 sometimes included cylinder weight; Excludes halon recovered from ships; [1]includes halon from ships; [2]includes halon from 45 ships; Recov = Recovered; Recy = Recycled

2451. Lithuania reported that halon for fire protection had been replaced by ODS-free alternatives where possible, thereby eliminating all non-critical uses. Most of the halons are very ozone-depleting and therefore there were significant benefits to the ozone layer as a result of this recovery and replacement programme.

2452. Determining the amount of halon on ships was problematic because no data were available at the time of the Project. During 2006-2008 Lithuania decommissioned the halon systems on 28 ships and recovered 2,526 kg of halon[405] including BF2[406]. According to the information available to MoE, today we do not have Lithuanian-flagged ships with halons. The BF2 and halon were replaced with ODS-free fire-protection equipment. The recovered halon has not been transferred yet to the Regional Halon Centre in Estonia. One additional ship with 214 kg of halon 2402 changed flag and is no longer under Lithuanian jurisdiction. Another ship is a special-purpose search and rescue ship with 420 kg of halon 2402 that was transferred to the military.

2453. Lithuania recently decommissioned and recovered 1,624 kg of halon from the TV Tower. Any remaining halon in 2009 was reported to be installed in certain military and aviation equipment, where it does not have to be decommissioned, as its use for military and aviation purposes was in accordance with the critical uses listed in Regulation (EC) No 2037/2000. Lithuania had a list of the quantities of halon used for these purposes, which had reduced as a result of the

[403] Order of the ENV. Minister Nr D1-206 of 2004 as amended Nr D1-463 of 2006 and amended Nr D1—365 of 2007

[404] LAND 50-2004: Art VII: Reporting to MoE by 1 March each year.

[405] Pers Comm 27 May 2009, Mrs Varvara Daubarienė, Chief Desk Officer of Chemicals Division, MoE

[406] 75% Ethyl bromide (= halon 2001) + 25% $C_2Br_2I_4$ (= halon 24024) is known as BF2 or 'Blend B' (Drs David Catchpole and Dan Verdonik HTOC pers. comm. 28 May 2009)

awareness campaign.

2454. The NOU reported that, although there were more than 250 companies involved in ODS recovery and reporting up to 2005, the number reporting reduced to about 180 in 2008 because ODS use has been replaced by alternatives.

2455. There are no ODS destruction facilities in Lithuania. In 2008, 5.8t of a mixture of CFC-12 and CFC-11 were shipped to Germany for destruction at RCN Chemie GmbH. The cost for destruction including transport cost was paid for by the owner of the ODS waste. This single shipment was the only ODS waste sent for destruction in the past 3 years.

8.8.5.5.2 Awareness about ODS, ODS substitute technology, and strengthening of institutional capacities for dealing with ODS phase-out

2456. Details on the extensive work carried out in Lithuania to increase the awareness of ozone layer depletion were provided in Section 8.8.4.5.1.2 above. The work on ODS substitute technology was focused on three enterprises and described in Section 8.8.6 (aerosol manufacture) and Section 8.8.7 (domestic refrigerator manufacture) and Section 8.8.8 (compressor manufacture).

2457. The institutional capacity to implement the recovery and recycling sub-project occurred as a result of cooperation between the NOU and the Customs Department (import of ODS recovery and recycling equipment); the Labour Education and Training Service (LETS); the Ministry of Social Labour (MSL); and the Ministry of Education and Science (MES). The NOU cooperated with the National Refrigeration Association who was responsible for the training programmes delivered during the sub-project on best practices in refrigerant management, and for certifying trainees. The NOU also held workshops and seminars with these and other organisations to raise awareness of ozone depletion and alternatives that could be implemented to avoid ozone depletion.

8.8.5.5.3 Authority / credibility, necessary to influence policy and decision-makers

2458. The NOU cooperated with a diverse range of government bodies in Lithuania that were involved in the recovery and recycling sub-project ODS (see paragraph 2457 above).

2459. The NOU had been instrumental in the drafting of legislation that mandated all companies to report annually to the MoE on the amounts recovered, recycled, reclaimed and destroyed[407]. In particular, these companies were required by legislation[408] to complete a Form annually (for use in the previous year) on the name of the substance, the source (import or EC), the quantity at the beginning of the year, the quantity added, the intended use, the amount recycled/regenerated/destroyed, and the amount remaining at the end of the year.

2460. Legislation adopted in 2006 specified that from 1 January 2008 only qualified personnel such as technicians and managers were permitted to service ODS contained in refrigeration & air-conditioning equipment, and heat pumps[409].

2461. The NOU was assessed as well-qualified to carry out tasks on ODS reduction and phase out due to a combination of political, technical and administrative expertise.

8.8.5.6 Assessment of monitoring and evaluation systems

8.8.5.6.1 Monitoring and evaluation design

2462. The GEF specified in the Project Document that *project monitoring would be performed by UNEP/UNDP and the cost for this activity would be included in the budget. A standard evaluation would be performed, except in the case that an in-depth evaluation was required by the GEF. In that case, independent consultants would be hired and sent to Latvia. Consultancy fees and travel costs would need to be obtained in addition to the amounts requested in the project.*

2463. The project budget was reported to cover *… project support services / monitoring-evaluation.* Apart from this statement, there was no specific design for monitoring and evaluation. There was no other statement by UNDP of the M&E design.

---

[407] LAND 50-2004: Art VII: Reporting to MoE by 1 March each year.
[408] Order of the ENV. Minister Nr D1-206 of 2004 as amended Nr D1-463 of 2006 and amended Nr D1—365 of 2007
[409] Resolution 695 of 10 July 2006. State certificate required by personnel that handle refrigerants (F-gas, ODS).

8.8.5.6.2 Monitoring and evaluation plan implementation

2464. There was no evidence of the implementation of an M&E plan by UNDP. There was reference to the issuance of the *Certificate of Completion* and the *Hand Over Protocols* during UNDP's visit to Lithuania in May 2001. There was no report available as a result of the visit.

8.8.5.6.3 Budgeting and Funding for monitoring and evaluation activities

2465. There was no information available on the budgeting and funding of the monitoring and evaluation activities.

8.8.5.6.4 Long-term monitoring

2466. Long-term monitoring was not envisaged in this project. Article 7 (Data Reporting) in the Montreal Protocol requires Parties to report on the quantities of ODS recovered / reclaimed and destroyed, but only if such ODS is imported or exported. Since most of the recovered / reclaimed ODS is not imported / exported but used nationally, there are few reports of such cases.

2467. In the case of Lithuania, there were two legislative instruments that mandated the monitoring of ODS recovered, recycled and destroyed.

2468. Regulation (EC) 2037/2000 that was in force from 1 October 1999 until 31 December 2009 required Member States to report annually on systems established to promote the recovery of used controlled substances, including the facilities available and the quantities of used ODS recovered, recycled, reclaimed or destroyed.

2469. Regulation (EC) 1005/2009 which replaced Regulation (EC) 2037/2000 requires enterprises operating refrigeration or air conditioning systems to keep records on the quantity and type of controlled substances added and the quantity of ODS recovered during maintenance, servicing and final disposal of the equipment or system. They are also required to keep records of other relevant information, including the identification of the company or technician which performed the maintenance or servicing, and the dates and results of the leakage checks carried out. These records are required to be made available on request to the competent authority of a Member State and to the Commission[410].

2470. However, despite the requirement that Member States do not have to report to the Commission annually according to the latest Regulation (EC) 1005/2009, the fact that the reports need to be available on request would mean that in practice the companies will need to collect data and continue to report to the Member State competent authority on the quantities of ODS recovered, recycled, reclaimed or destroyed.

2471. The prospect of long term monitoring of ODS recovered, recycled and destroyed in Lithuania was therefore assessed as likely because of their mandatory monitoring and reporting requirements.

8.8.5.7 Assessment of processes that affected attainment of project results

8.8.5.7.1 Preparation and readiness

2472. The Project Document was signed by UNDP on 5 May 1998 and the project was completed in May 2001. As the project was closed in 2001, the equipment was most likely to have been distributed to companies in 1999 or 2000. The National Refrigeration Association was formed in 1998. The NOU was established in 2002.

2473. Most of the technicians were trained from 1993 to 1996 in service enterprises, as by the end of 1996 there were only 29 personnel in service and industrial enterprises that had not been trained. During the term of the sub-project, there were two seminars that provided practical demonstrations on the use of the equipment for recovery and recycling. After the project was completed and in 2008, National Refrigeration Association trained a further 50 trainees on refrigerant management.

2474. The evaluation team concluded that the funds from this recovery and recycling sub-project did not contribute significantly toward the training of personnel, and that the National Refrigeration Association had performed a key role in the distribution of equipment to companies for the ODS

[410] Article 23(3) of Regulation (EC) No 1005/2009 on ODS

recovery and recycling operations. The NOU, since it had not been established, did not participate in the training or equipment distribution. The industry therefore was assessed as prepared and ready for the sub-project, but the government was not.

8.8.5.7.2 Country commitment and motivation

2475. There was a delay of about 4 years between UNEP's signature of the document and the establishment of the NOU in 2002, which was taken to be the year when Lithuania showed commitment and motivation in relation to the ODS recovery and recycling sub-project. As the project was closed in 2001, Lithuania's commitment and motivation for this project was assessed as low.

2476. Since the completion of the sub-project, however, the NOU was established and the responsibilities for monitoring and reporting of ODS consumption were allocated to several government bodies. There was a legislative requirement to report ODS recovered, recycled and destroyed. The NOU and the government became as active as the industry / National Refrigeration Association. The activities of Lithuania from the time that the NOU was established indicated a heightened level of commitment and motivation, compared to the period prior to and during the sub-project.

8.8.5.7.3 Stakeholder involvement

2477. Several organisations assisted the MoE/NOU to implement this sub-project on recovery and recycling including the Customs Department (for the import of recovery and recycling equipment); the Labour Education and Training Service (LETS); the Ministry of Social Labour (MSL); and the Ministry of Education and Science (MES). LETS, MSL and MES collectively provided vocational education programmes, including the syllabus on refrigerant management. The National Refrigeration Association was responsible for delivering training programmes during the sub-project on best-practice ODS recovery and recycling, and for certifying trainees. During the course of the sub-project, the NOU was assisted by local experts. Key stakeholders were the 16 companies that received the ODS recovery and recycling equipment, but also more than 100 other companies that were encouraged to participate in the discussions and to purchase recovery and recycling equipment.

2478. The stakeholder partnerships formed as a result of these relations, although established after the closure of the sub-project, were assessed as creating effective stakeholder participation to progress work on the recovery and recycling of ODS, and the training of technicians in best-practice ODS recovery and recycling.

8.8.5.7.4 Financial planning

2479. UNEP reported that the budget and fund management were *progressing according to budget, funds are wisely spent and correctly and transparently accounted for and accounting kept up to date*. The evaluators presumed that budget and expenditure control were similar in this UNDP sub-project, as there were no reports available by UNDP on financial planning.

8.8.5.7.5 UNEP / UNDP supervision and support

2480. UNDP was the lead agency for the recovery and recycling sub-project. In all the projects that involved provision of equipment, UNDP took responsibility for tendering and procurement of the equipment, and delegated responsibility for its distribution to the local government. The assessment team assumed UNDP applied the same conditions to Lithuania, as no documents were available that indicated otherwise. On this basis, the evaluation team assessed UNDP supervision and support as satisfactory.

8.8.5.7.6 Co-financing and project outcomes & sustainability

2481. There was no co-finance in the sub-project on ODS recovery and recycling. The lack of co-finance was assessed as unlikely to have affected the sustainability of ODS recovery and recycling activities in Lithuania after the sub-project was concluded, because companies that did not receive equipment and that were not included in the sub-project purchased their own equipment. In addition, the EU legislative requirements for the recovery and recycling of ODS were assessed as more likely to have a greater impact on sustainability than co-finance. These

legislative factors were discussed in Section 8.8.5.3.4 "*Environmental*" above.

8.8.5.7.7 Project implementation delays and impact on project outcomes & sustainability

2482. The delays in establishing the NOU did not delay the project, as the project was completed in May 2001 and the NOU established in 2002. At the time when the NOU did not exist, the National Refrigeration Association became active in distributing the equipment, and after the project in training of personnel.

2483. Apart from the EC legislation discussed above, Lithuania also adopted national legislation in 2004 that banned the disposal of unwanted refrigerators in a landfill, and that required municipalities and companies to put in place procedures to manage the environmentally-safe recovery of ODS under the Waste Management Act[411]. Lithuania's national legislation did not require the recovery of ODS from the foam of unwanted refrigerators, only the compressors which contained only about 30% of the refrigerator's ODS. In February 2005, the RAL Quality Assurance Association reported that companies were not recovering ODS from the foam of used refrigerators, and that this activity was contrary to EU legislation that required recovery from both the compressor and the foam.

8.8.5.8 Sub-Project Rating

LIT/97/G32 National programme for the recovery and recycling of ODS refrigerants (UNDP/UNOPS)		
Criterion	**Evaluator's Summary Comments**	**Evaluator's Rating**
Attainment of project objectives and results Sub criteria (in yellow below)	See comments below	S
Effectiveness	The National Refrigerants Association distributed the equipment, and the amount of ODS recovered was about 17% less than targeted	S
Relevance	Recovery of ODS and training of technicians in best practices are consistent with minimising the detrimental effect of ODS on the ozone layer, complying with EU legislation and avoiding climate forcing	HS
Efficiency	The cost-effectiveness of Lithuanian project was about twice as expensive as the average cost-effectiveness of MLF-funded projects implemented in 25 developing countries	S
Sustainability of Project outcomes (overall rating) Sub criteria (in yellow below)	See comments below	S
Financial	Delivered within budget; Lithuania also has access to EU financial resources for environmental initiatives; NOU is funded by the Ministry of Environment. The combination of activities is likely to promote ongoing activities on recovery and recycling of ODS	S

[411] LAND 50-2004. Article VI: Environmental control of controlled substances

LIT/97/G32 National programme for the recovery and recycling of ODS refrigerants (UNDP/UNOPS)		
Criterion	**Evaluator's Summary Comments**	**Evaluator's Rating**
Socio-Political	The range of organisations involved was assessed as sufficient to promote ongoing activities in ODS recovery and recycling	S
Institutional framework and governance	Government infrastructure is likely to promote the sustainability of the recovery and recycling operations	S
Environmental	EU ODS legislation in the past 10 years promotes the sustainability of the recovery and recycling operations	HS
Achievement of outputs and activities		S
Monitoring and Evaluation (overall rating) Sub criteria (in yellow below)	See below	
M&E Design	UNDP did not describe the M&E design	U
M&E Plan Implementation (use for adaptive management)	UNDP did not describe the M&E implementation plan	U
Budgeting and Funding for M&E activities	UNDP did not describe the M&E budget and expenditure	U
Catalytic Role	No categorisation required	
Preparation and readiness	Industry prepared (as the National Refrigeration Association), but the government was not	S
Country commitment and motivation*	Project was completed before the NOU was established, which indicated a lack of commitment and motivation; after the NOU was established, there was more evidence of country commitment and motivation	S
Stakeholders' involvement	Partnerships formed with stakeholders by NOU that made of their skills, experience and knowledge	S
Financial planning	No information provided on which to examine budget versus expenditure	U
UNDP supervision and support**	UNDP took responsibility for tendering and procurement of the equipment	S
Overall Rating		S

Highly Satisfactory (HS); Satisfactory (S); Moderately Satisfactory (MS); Moderately Unsatisfactory (MU); Unsatisfactory (U); Highly Unsatisfactory (HU);
*Motivation replaced TOR '*driveness*'; **Support replaced TOR 'backshopping'

8.8.6 *LIT/97/G33 Phase out of the use of CFCs in the production of aerosols at Vilnius Buitine Chemija (UNDP/UNOPS)*

8.8.6.1 Introduction

2484. Vilnius Buitine Chemija (VBC) was an aerosol company that filled aerosols under contract. Aerosol Baltija purchased Baltic Chemicals International (previously VBC) in 2004. The GEF provided $467,615 to VBC to replace CFCs with hydrocarbon as the propellant in the aerosols. The project was initiated in 1998 and completed in May 2001. Obtaining information on the results of this sub-project was difficult as ownership of the company had changed twice in the past nine years since the project had been completed.

8.8.6.2 Attainment of objectives and planned results

8.8.6.2.1 Effectiveness

2485. There were no specific achievement or performance indicators that were developed for this project. Effectiveness could be evaluated by assessing:

- Whether or not the aerosol production was converted from CFC to hydrocarbon propellant;
- The quantity of CFCs that were phased out as a result; and
- The impact that the conversion had on the VBC's profitability.

2486. The achievement of outputs and activities by Lithuania in this sub-project on the conversion from CFC to hydrocarbon propellant in aerosol production, as measured against these performance indicators, are provided in Section 8.8.6.5.1 "*Delivered outputs*" below.

2487. On this basis, and also in consideration of the deliverables described in Section 8.8.6.5.1, the effectiveness of the conversion from CFC to hydrocarbon propellant in aerosol production at VBC was assessed as highly satisfactory.

8.8.6.2.2 Relevance

2488. Reduced emissions of ODS in Lithuania as a result of the conversion from CFC to hydrocarbon propellant in aerosol production at VBC is consistent with the objectives of the Vienna Convention and the Montreal Protocol, which *requires Parties to take appropriate measures in accordance with the provisions of this Convention and of those Protocols in force to which they are party to protect human health and the environment against adverse effects resulting or likely to result from human activities which modify or are likely to modify the ozone layer*[412].

2489. VBC used 245.6 ODP-tonnes of aerosols per year, which was significant as this was 63% of the CFCs used in Lithuania in 1995. Phasing out this quantity of CFCs avoided this quantity of annual emissions and potential damage to the ozone layer.

2490. The GEF established in 1995 an Ozone Layer Depletion Focal Area in response to the Montreal Protocol. The Focal Area has the strategic objective of protecting human health and the environment by assisting countries to phase out their consumption and production of ODS, to prevent emissions of ODS, and to encourage the uptake of alternative technologies and practices according to a country's commitments under the Montreal Protocol. The financial interventions in the GEF Focal Area contribute to the return of the ozone layer to pre-1980 ozone levels, which is expected by 2065.

2491. Most recently, the dual capability of ODS to both reduce ozone and to have a detrimental impact on the climate have been described[413]. Global ODS consumption in 1989 was equivalent to about 9,200 million tonnes (9 Gt) CO_2-eq/year, which was reduced to about 1,870 million tonnes (1.8 Gt) CO_2-eq/year in 2007 as a result of ODS phase-out activities under the Montreal Protocol. This reduction of about 7 Gt CO_2-eq/year was at least three times greater than the Kyoto Protocol's reduction target (about 1-2 Gt CO_2-eq/year in 2008-2012), demonstrating that the global ODS reductions achieved so far have already yielded a larger climate benefit than the

[412] Handbook for the Vienna Convention for the Protection of the Ozone Layer - 7th Edition (2006). Article 2: General Obligations.

[413] Velders, J.M., Andersen, S.O., Daniel, J.S., Fahey, D.W. and M. McFarland. 2007. The Importance of the Montreal Protocol in protecting climate. http://www.pnas.org/content/104/12/4814.abstract

current Kyoto Protocol target.

2492. The implementation of CFC-free production of aerosols prior to Lithuania's accession to the EU was relevant for avoiding non-compliance with EU legislation on ODS that applied shortly after Lithuania's accession to the EU in May 2004. The EU had banned the use of CFCs in 1994 for such production[414], and therefore Lithuania's replacement of the CFCs in 2000 was consistent with action that had been taken by the EU six years previously.

2493. The actions taken by Lithuania to phase out ODS is therefore relevant to further protection of the ozone layer (Montreal Protocol), accession to the EU, and relevant to reducing the impact of radiative forcing of the climate (Kyoto Protocol).

8.8.6.2.3 Efficiency

2494. The cost-effectiveness of this sub-project was $1.90 ODP-kg per year, based on a *targeted* phase out by VBC of 245.6 ODP-tonnes within the GEF budget of $467,615.

2495. The MLF reported no clear correlation between the size of an aerosol project and its cost-effectiveness (see Figure 31 on page 410), neither in relation to the volume of funding nor the CFC consumption phased out[415]. The MLF also reported a rather wide range of values for the actual cost-effectiveness, from less than $1.00 to almost $9.00 ODP-kg per year. Only four projects were approved above the $4.40 ODP-kg per year, and the remainder were below this value[416]. The average was approximately $3.00 ODP-kg per year, for quantities phased out up to about 100 ODP-tonnes per year. The 35 projects evaluated by the MLF were 45% of all 77 aerosol projects completed by the end of 2001 and 32% of 108 aerosol projects approved by the MLF's Executive Committee by July of 2002.

2496. The cost-effectiveness of the phase out of CFCs at VBC in Lithuania at $1.90 ODP-kg per year was assessed as highly satisfactory as this was about 50% of the average cost-effectiveness of MLF-funded aerosol projects in developing countries.

8.8.6.3 Assessment of sustainability of project outcomes

8.8.6.3.1 Financial resources

2497. GEF funding of $467,615 over two years was provided for technical advisory services, capital equipment, training in operational safety, contingencies and project support services including monitoring-evaluation. The full capital costs were $ 570,016, but due to foreign ownership only $467,615 were eligible for GEF funding (VBC was 80.9% Lithuanian owned). Operational costs of $158,350 over a 4-year period were calculated, but were not claimed as the GEF rules did not support such a claim. The enterprise co-finance was declared as $260,751.

2498. There was no information available indicating expenditure of the GEF budget of $467,615, and moreover no report of expenditure exceeding budget.

2499. VBC reported increased aerosol sales in 2007 and 2008, compared to the number of aerosols produced before the sub-project was implemented. VBC operates 8h/day for 5 days per week, which it reported was typical of the working week for its operations over the past 5 years. This level of operation continued during the financial crisis, which suggested that the operations of the company were financially robust at a time when other companies were going bankrupt.

2500. Considering the project was completed in 2001 and that aerosols have been produced since that time[417], the sub-project was evaluated as financially sustainable and the financial aspects of the sub-project were assessed as satisfactory.

8.8.6.3.2 Socio-political

2501. The main organisations that assisted the MoE/NOU and UNDP to implement this sub-project that converted VBC from CFC to hydrocarbon propellant aerosol production were the Customs Department (for the import of aerosol filling equipment), and Aerofil that installed the

---

[414] Regulation (EC) No 3093/94.

[415] MLF. 2002. Final report on the evaluation of aerosol products. UNEP/OzL.Pro/ExCom/38/5/Corr.1. See Annex III for cost-effectiveness.

[416] The three aerosol projects that had been completed in China at the time of the evaluation were excluded from the because they reported ODP phase-out of 4,000 to 6,000 tonnes each would have altered the scale.

[417] VBC provided sales for 1993 to 1995, 1996, and 2005 to 2008. The evaluators assumed production continued from 2001 to 2004.

equipment and trained VBC personnel in the safe use of hydrocarbons. Aerosol Baltija in 2009 reported that spares were readily available from Aerofil for their equipment at the facility, and therefore they were satisfied with the sustainability of spare parts for the equipment.

2502. The financial sector was beyond the control of many companies during the global economic crisis in 2008 and 2009. Despite the adverse conditions at that time, Aerosol Baltija reported continued operations that suggested the company was not heavily indebted to the financial institutions.

2503. Aerosols were exported in 2008 by Aerosol Baltija (the current successor company to VBC) to Russia (36%), Lithuania (29%), Sweden (28%), Finland (6%) and other countries. In contrast, aerosols in 1996 were mostly exported to Russia and the former states of the USSR including Uzbekistan, Kazakhstan, Tajikistan, Ukraine and Estonia.

2504. For these reasons, the socio-political environment was assessed as satisfactory because the operations of VBC and its successor companies had continued since the conversion of the facility from CFCs to hydrocarbon propellant.

8.8.6.3.3 Institutional framework and governance

2505. The ability of VBC to continue to use CFCs for the production of aerosols after the phase out of CFCs on 1 January 1996 in the Montreal Protocol dependent totally on whether or not the government of Lithuania had banned the import of CFCs and their use for the production of aerosols.

2506. In 1996, Lithuania's Action Plan[418] included an environmental protection goal to reduce ODS by introducing legislation from 1996 to 1998 that would control ODS import, export and use. Legislation in 1999 introduced the requirement for a license to store ODS; import quotas for ODS; a ban on the use of CFCs for use in new refrigeration and air-conditioning equipment, in aerosols and in the production of foam; and restrictions on the use of methyl bromide.

2507. Although the ban on the import of CFCs was three years later than required under the Montreal Protocol for developed countries, the ban that was eventually implemented by Lithuania was supportive of the sub-project because it eliminated the option for sustainable production of aerosols using CFCs. Importantly, it laid the foundation for the hydrocarbons as the only viable alternative for ongoing production of aerosols.

2508. For these reasons, the performance of the institutional framework and governance in Lithuania in the implementation of this sub-project that converted this aerosol enterprise from CFC to hydrocarbon propellant was assessed as satisfactory.

8.8.6.3.4 Environmental

2509. There were few environmental risks that were assessed as potentially undermining this work as hydrocarbons are not ozone-depleting substances and they have an extremely low to negligible global warming impact. Therefore the use of hydrocarbons for aerosol production is not affected by legislation directed at ozone-depleting substances and global warming gases.

2510. The most significant factor in the use of hydrocarbons is the requirement for safety equipment and procedures to ensure personnel safety. Facilities throughout the world have installed adequate safety equipment and procedures which, when adhered to by staff and management, have produced the bulk of the world's aerosols. Safety features that have helped to avoid accidents in the course of the production of aerosols with hydrocarbons include the use of a separate manufacturing building from the storage tanks containing hydrocarbons, installing a blast wall in between the flammable propellant charging rooms and other areas, providing a well-ventilated gas house under positive ventilation, installing discharge vents from vacuum and propellant pumps, and providing automatic sensing systems to measure flammable gas concentrations in areas where the hydrocarbon is stored and in the filling areas which are connected to alarms.

2511. Because of the flammability of hydrocarbons, the Fire Rescue Department in Lithuania assisted the government to develop and enforce standards for the manufacture and storage of aerosol products, and for storing and handling hydrocarbons at facilities such as VBC. In addition to

[418] Decree No I-1550. 25 September 1996. Lithuanian Republic Parliament

these codes and standards, there are other safety measures described above that are important and relevant.

8.8.6.4 Catalytic role

2512. The key factors influencing catalytic action are *innovation, demonstration, replication* and *cooperation*. There assessors were not aware of other CFC aerosol production facilities in Lithuania at the time, and therefore there was no opportunity for catalytic action as a result of the implementation of this sub-project that converted aerosol production at VBC from CFC to hydrocarbon propellant.

8.8.6.5 Achievement of outputs and activities

8.8.6.5.1 Delivered outputs

2513. There were no specific achievement or performance indicators that were developed for this project. Effectiveness could be evaluated by assessing:

- Whether or not the aerosol production was converted to CFC-free technology;
- The quantity of CFCs that were phased out as a result; and
- The impact that the conversion had on the aerosol producer's profitability.

The delivered outputs are discussed for each of them.

8.8.6.5.1.1 Conversion to CFC-free production

2514. VBC successfully replaced CFCs with hydrocarbon as the propellant in aerosol production. The project was initiated in 1998 and completed in May 2001. The sub-project was considered as completed by UNDP when the *Certificate of Completion* and the *Hand-Over Protocol* were issued during the UNDP mission in May 2001.

2515. The hydrocarbon production installed at VBC as a result of the sub-project was continued by Baltic Chemicals International and then Aerosol Baltija who is the current owner. This demonstrated that the conversion to hydrocarbon technology was sustainable, considering that the life of the equipment was expected to be 10 years from the date of installation.

2516. The conversion to CFC-free technology was assessed as highly successful as the consumption of CFC-11 and CFC-12 for aerosol production were completely eliminated.

8.8.6.5.1.2 Quantity of CFCs phased out

2517. The installation of CFC-free technology for aerosol production at VBC eliminated the use of 245.6 ODP-tonnes of CFC-11 and CFC-12 used for this purpose per year. The elimination of this quantity of CFCs was significant as it constituted 63% of the CFCs used in Lithuania in 1995.

2518. The conversion to CFC-free technology was assessed as highly successful as the sub-project succeeded in eliminating the Project target of 245.6 ODP-tonnes of CFC-11 and CFC-12 for aerosol production.

8.8.6.5.1.3 Impact of the conversion on enterprise profitability

2519. Aerosol Baltija, who purchased Baltic Chemicals International (previously VBC) in 2004, reported sales of aerosol products for the years shown in Figure 34. Figure 34 shows that the sales have increased in the past two years, compared with the number of aerosols sold annually before the Project was implemented. Several owners of the company in the past 10 years precluded sales figures from all owners being available for all years.

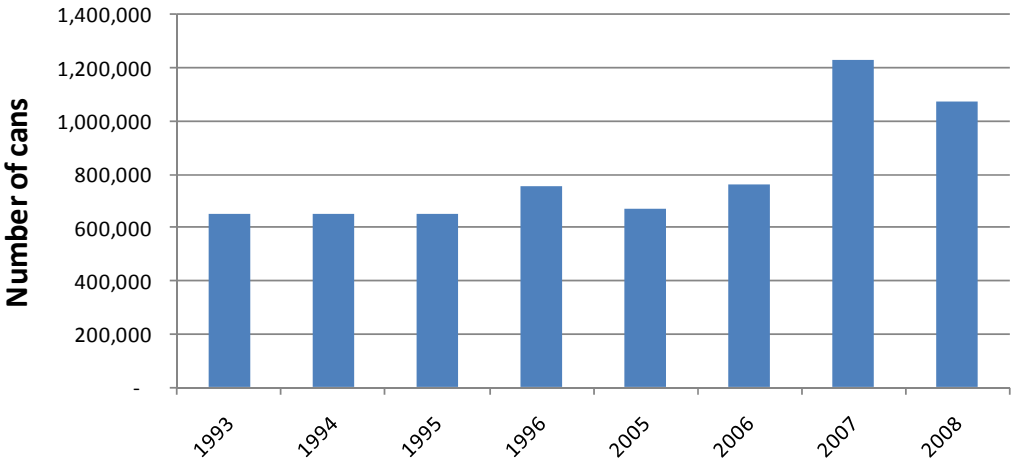


Figure 34: Number of aerosol cans manufactured with CFCs (1993 to 1996, by Vilnius Buitine Chemija) and with hydrocarbon propellant (2005 to 2006, by Aerosol Baltija)

2520. The company may also be exporting to countries where sales are more profitable. For example, in 1996 and prior to the sub-project implementation, aerosols were mostly exported to Uzbekistan, Russia, Kazakhstan, Tajikistan, Ukraine and Estonia. More recently, aerosols were exported in 2008 to Russia (36%), Lithuania (29%), Sweden (28%), Finland (6%) and other countries. While it was not possible to examine the profitability of the company over time, the installation of the CFC-free technology could have opened up more lucrative marketing opportunities for the company.

2521. Aerosol Baltija reported that the Aerofil equipment needed upgrading to improve productivity. This comment by the company correlates well with the lifetime of the equipment in the project which was estimated to be 10 years.

2522. The installation of the CFC-free technology was assessed as highly successful as the installation was a major factor that contributed to an increase in the number of aerosols sold and it increased market opportunities.

8.8.6.5.2 Awareness about ODS, ODS substitute technology, and strengthening of institutional capacities for dealing with ODS phase-out

2523. Details on the extensive work carried out in Lithuania to increase the awareness of ozone layer depletion were provided in Section 8.8.4.5.1.2 above. The work on ODS substitute technology was focused on three enterprises, including the aerosol company VBC which was one of the major consumers of CFCs in Lithuania at that time. Hydrocarbons as mainly mixtures of propane and butane became the dominant aerosol propellant in many developed and developing countries, following the ban on the use of CFCs for aerosols. Hydrocarbons as replacements for CFCs would have been well-know to aerosol-producing companies such as VBC.

2524. The NOU was established in 2002 and after the completion of this sub-project. The institutional capacity available at that time that assisted in the implementation of this project was the MoE (links to international funding bodies), the Customs Department (import of hydrocarbon technology for aerosol production), and the Fire Rescue Department in Lithuania that provided advice and enforced standards related to the manufacture and storage of aerosol products, and for storing and handling hydrocarbons. Aerofil was one of the most important contributors to the success of the sub-project, as that company provided and installed the equipment, and provided training and advice on hydrocarbon safety.

8.8.6.5.3 Authority / credibility, necessary to influence policy and decision-makers

2525. The MoE cooperated with a diverse range of government bodies in Lithuania that were involved in sub-projects that replaced ODS (see paragraph 2457 above), such as this sub-project on the replacement of CFCs for aerosol production.

2526. In 1996, Lithuania's Action Plan[419] included an environmental protection goal to reduce ODS by introducing legislation from 1996 to 1998 that would, *inter alia*, ban the use of CFCs for use in the production of aerosols. Further information on the key policy and decision-makers was provided in Section 8.8.6.3.3 "*Institutional framework and governance*" above.

2527. The MoE cooperated with international funding bodies relevant to this CFC phase out project (GEF, UNDP) to develop the Project Document, the Customs Department to facilitate the import of hydrocarbon technology for aerosol production, and the Fire Rescue Department for advice on standards related to the manufacture and storage of aerosol products, and for storing and handling hydrocarbons.

2528. The MoE staff were assessed as well-qualified to carry out tasks related to the installation of CFC-free technology for aerosol production at VBC due to a combination of political, technical and administrative expertise.

8.8.6.6 Assessment of monitoring and evaluation systems

8.8.6.6.1 Monitoring and evaluation design

2529. The GEF specified in the Project Document that the budget was to cover, *inter alia … project support services / monitoring-evaluation.* Apart from this statement, there was no specific design for monitoring and evaluation. There was no other statement by UNDP of the M&E design.

8.8.6.6.2 Monitoring and evaluation plan implementation

2530. There was no evidence of the implementation of an M&E plan by UNDP. There was reference only to the issuance of the *Certificate of Completion* and the *Hand Over Protocols* during the visit by UNOPS to Lithuania in May 2001.

8.8.6.6.3 Budgeting and Funding for monitoring and evaluation activities

2531. There was no information available on the budgeting and funding of the monitoring and evaluation activities.

8.8.6.6.4 Long-term monitoring

2532. Long-term monitoring was not envisaged in this sub-project, because the enterprise was 'locked' into hydrocarbon technology once VBC had been converted to manufacture only CFC-free aerosols. CFCs were also no longer obtainable because they had been banned several years earlier. The enterprise may have also had better marketing opportunities with hydrocarbon aerosols than those that used CFCs as a propellant.

8.8.6.7 Assessment of processes that affected attainment of project results

8.8.6.7.1 Preparation and readiness

2533. The Project Document was signed by UNDP on 5 May 1998 and the project was completed in May 2001 three years later. As the project was closed in 2001, the hydrocarbon filling technology was most likely to have been installed at VBC in 1999 or 2000. The MoE assumed the lead for activities on ozone protection until the NOU was established within the MoE in 2002.

2534. The MoE and VBC were assessed as prepared and ready for this sub-project as the import of CFCs had been banned in legislation that came into force from 1996 to 1998. The industry therefore had access only to stocks of CFCs that were present in Lithuania at the time. The ban on the import of CFCs resulted in the industry being fully committed to CFC-free technology for the production of aerosols.

8.8.6.7.2 Country commitment and motivation

2535. There was very little delay between the signing of the Project Document, tendering and procurement of the equipment to use hydrocarbons for aerosol filling, installation of the equipment and the closing of the project. Hydrocarbon technology had been used in many plants worldwide for the production of aerosols at that time, so industry resistance to the

[419] Decree No I-1550. 25 September 1996. Lithuanian Republic Parliament

technology was minimal. In addition, Lithuania had banned the import of CFCs in legislation that came into force from 1996 to 1998, prior to the start of the sub-project. These activities were assessed as indicating that Lithuania was committed and motivated to eliminate the use of CFCs in aerosol production.

8.8.6.7.3 Stakeholder involvement

2536. The main stakeholders were the MoE that cooperated with international funding bodies relevant to this CFC phase out project (GEF, UNDP) to develop the Project Document; the Customs Department to facilitate the import of hydrocarbon technology for aerosol production; the Fire Rescue Department for advice on standards related to the manufacture and storage of aerosol products, and for storing and handling hydrocarbons; VBC as the company that operated the aerosol production facility; Aerofil that installed, tested and trained staff in the safe use of the hydrocarbon technology; and UNDP that tendered and procured the equipment for the sub-project.

2537. The stakeholder involvement that were formed as a result of the sub-project were assessed as creating satisfactory stakeholder partnerships that progressed work on the conversion from CFC to hydrocarbon propellant in aerosol production at VBC.

8.8.6.7.4 Financial planning

2538. UNEP reported that the budget and fund management in the Institutional Strengthening sub-project were … *progressing according to budget, funds are wisely spent and correctly and transparently accounted for and accounting kept up to date*. The evaluators presumed that budget and expenditure control were similar in this UNDP sub-project, as there were no reports available by UNDP on financial planning.

8.8.6.7.5 UNDP supervision and support

2539. UNDP was the lead agency for the recovery and recycling sub-project. In all the projects that involved provision of equipment, UNDP took responsibility for tendering and procurement of the equipment, and delegated responsibility for its distribution to the local government. The assessment team assumed UNDP applied the same conditions to Lithuania, as no documents were available that indicated otherwise. On this basis, the evaluation team assessed UNDP supervision and support as satisfactory.

8.8.6.7.6 Co-financing and project outcomes & sustainability

2540. GEF funding of $467,615 over two years was provided for technical advisory services, capital equipment, training in operational safety, contingencies and project support services including monitoring-evaluation. The full capital costs were $570,016, but due to foreign ownership only $467,615 were eligible for GEF funding (VBC was 80.9% Lithuanian owned). Operational costs of $158,350 over a 4-year period were calculated, but were not claimed as the GEF rules did not support such a claim. The enterprise co-finance was declared as $260,751, but a description of what this covered was not provided.

2541. Provision of co-finance by VBC was assessed as a significant contributor toward ensuring the sustainability of the conversion of VBC from CFC to hydrocarbon propellant in aerosol production after the sub-project was concluded. A successful company will usually invest funds only in areas that have the prospects for recovery of investment costs over time, which can only be regained if the operations continue after company funds have been spent on the investment. However, a major contributor to sustainability was that the company was locked into CFC-free technology, as the import and use of CFCs had been banned in Lithuania several years earlier.

8.8.6.7.7 Project implementation delays and impact on project outcomes & sustainability

2542. There was some delay in the implementation of this project (less than 12 months), which was assessed as not being a major contributor to the outcome and sustainability of the sub-project. The sustainability of the project was due to the company being locked into CFC-free technology by the CFC import and use ban that came into force in Lithuania several years earlier, and that the technology that was being implemented had been proven successful in many other conversions of aerosol technology worldwide.

8.8.6.8 Sub-Project Rating

LIT/97/G33 Phase out of the use of CFCs in the production of aerosols at Vilnius Buitine Chemija (UNDP/UNOPS)		
Criterion	**Evaluator's Summary Comments**	**Evaluator's Rating**
Attainment of project objectives and results Sub criteria (in yellow below)	See comments below	HS
Effectiveness	The conversion from CFC to hydrocarbon propellant in aerosol production at VBC was assessed as highly satisfactory	HS
Relevance	Conversion to non-ODS technology is consistent with minimising the detrimental effect of ODS emissions on the ozone layer, reducing climate warming and compliance with EU and Montreal Protocol requirements	HS
Efficiency	The cost-effectiveness of the phase out of CFCs at VBC in Lithuania at $1.90 ODP-kg per year was assessed as highly satisfactory as this was about 50% of the average cost-effectiveness of MLF-funded aerosol projects in developing countries	HS
Sustainability of Project outcomes (overall rating) Sub criteria (in yellow below)	See comments below	S
Financial	Probably delivered within budget; significant level of co-finance (36%); increased sales after the project; sales continuing 9 years later demonstrated sustainability	S
Socio-Political	Socio-political environment was assessed as satisfactory because the operations of VBC and its successor companies had continued since the conversion of the facility from CFCs to hydrocarbon propellant.	S
Institutional framework and governance	Lithuania banned import and use of CFCs for aerosols at least 2 years before the start of the project	HS
Environmental	Conversion to CFC-free technology was irreversible due to legislation in force; good global safety record for the use of hydrocarbons, which promoted sustainability of CFC-free production	S
Achievement of outputs and activities		S
Monitoring and Evaluation	See below	

LIT/97/G33 Phase out of the use of CFCs in the production of aerosols at Vilnius Buitine Chemija (UNDP/UNOPS)		
Criterion	**Evaluator's Summary Comments**	**Evaluator's Rating**
(overall rating) Sub criteria (in yellow below)		
M&E Design	No specific design for monitoring and evaluation	U
M&E Plan Implementation (use for adaptive management)	no evidence of the implementation of an M&E plan by UNDP	U
Budgeting and Funding for M&E activities	No information available on the budgeting and funding of the monitoring and evaluation activities	U
Catalytic Role	No categorisation required	
Preparation and readiness	The government and the industry were assessed as prepared and ready for this sub-project, as CFCs import and use had been banned before the start of the project, and the industry was aware of the success of hydrocarbon installations worldwide	S
Country commitment and motivation*	Little implementation delay and bans on CFC import and use both indicated a satisfactory level of country commitment and motivation	S
Stakeholders' involvement	Satisfactory stakeholder partnerships that progressed work on the conversion from CFC to hydrocarbon propellant in aerosol production at VBC	S
Financial planning	No reports by the company or the NOU of inadequate financial planning	S
UNEP supervision and support**	UNDP was responsible for tendering and procurement for equipment for use in aerosol production. No evidence of a visit during installation of the equipment.	S
Overall Rating		S

Highly Satisfactory (HS); Satisfactory (S); Moderately Satisfactory (MS); Moderately Unsatisfactory (MU); Unsatisfactory (U); Highly Unsatisfactory (HU);
*Motivation replaced TOR '*driveness*'; **Support replaced TOR 'backshopping'

8.8.7 LIT/97/G34 Elimination of the use of CFCs in the manufacture of domestic refrigerators and freezers at Snaige (UNDP/UNOPS)

8.8.7.1 Introduction

2543. The GEF provided $2,009,162 from 1996 to 2000 toward the cost of installing technology to manufacture CFC-free domestic refrigerators and freezers at Snaigė, the only such manufacturer in the Baltic. As a result, a total of 112 ODP-tonnes of CFCs were eliminated which was equivalent to 29% of the ODS consumption in Lithuania in 1995.

8.8.7.2 Attainment of objectives and planned results

8.8.7.2.1 Effectiveness

2544. There were no specific achievement or performance indicators that were developed for this sub-project. Effectiveness could be evaluated by assessing:

- Whether or not the refrigerator production was converted to CFC-free technology;
- The quantity of CFCs that were phased out as a result; and
- The impact that the conversion had on the Snaige's profitability.

2545. The achievement of outputs and activities by Lithuania in this sub-project on the conversion of refrigerator production to CFC-free technology, as measured against these performance indicators, are provided in Section 8.8.7.5.1 "*Delivered outputs*" below.

2546. On this basis, and also in consideration of the deliverables described in Section 8.8.7.5.1, the effectiveness of the conversion of refrigerator production to CFC-free technology at Snaige was assessed as highly satisfactory.

8.8.7.2.2 Relevance

2547. Reduced emissions of ODS in Lithuania as a result of the conversion of refrigerator production to CFC-free technology at Snaige is consistent with the objectives of the Vienna Convention and the Montreal Protocol, which *requires Parties to take appropriate measures in accordance with the provisions of this Convention and of those Protocols in force to which they are party to protect human health and the environment against adverse effects resulting or likely to result from human activities which modify or are likely to modify the ozone layer*[420].

2548. As a result of the successful implementation of this sub-project by Snaige, approximately 112 ODP-tonnes of CFCs were eliminated per year. This consumption was equivalent to about 29% of the ODS consumed in Lithuania in 1995. Phasing out this quantity of CFCs avoided this quantity of annual emissions and potential damage to the ozone layer.

2549. The GEF established in 1995 an Ozone Layer Depletion Focal Area in response to the Montreal Protocol. The Focal Area has the strategic objective of protecting human health and the environment by assisting countries to phase out their consumption and production of ODS, to prevent emissions of ODS, and to encourage the uptake of alternative technologies and practices according to a country's commitments under the Montreal Protocol. The financial interventions in the GEF Focal Area contribute to the return of the ozone layer to pre-1980 ozone levels, which is expected by 2065.

2550. Most recently, the dual capability of ODS to both reduce ozone and to have a detrimental impact on the climate have been described[421]. Global ODS consumption in 1989 was equivalent to about 9,200 million tonnes (9 Gt) CO_2-eq/year, which was reduced to about 1,870 million tonnes (1.8 Gt) CO_2-eq/year in 2007 as a result of ODS phase-out activities under the Montreal Protocol. This reduction of about 7 Gt CO_2-eq/year was at least three times greater than the Kyoto Protocol's reduction target (about 1-2 Gt CO_2-eq/year in 2008-2012), demonstrating that the global ODS reductions achieved so far have already yielded a larger climate benefit than the current Kyoto Protocol target.

2551. The implementation of CFC-free production of refrigerators was important for Lithuania's compliance with the Montreal Protocol, which required no consumption of CFCs from 1 January 1996 in developed countries such as Lithuania. In addition, elimination of the consumption of CFCs was important to Lithuania's accession to the EU in May 2004. The EU had banned the use of CFCs in 1994 for all uses[422], and therefore Lithuania's replacement of the CFCs in 2000 was consistent with action that had been taken by the EU six years previously.

2552. The actions taken by Lithuania to phase out ODS is therefore relevant to further protection of the ozone layer, compliance with the Montreal Protocol, accession to the EU, and important to reducing the impact of radiative forcing of the climate (Kyoto Protocol).

---

[420] Handbook for the Vienna Convention for the Protection of the Ozone Layer - 7th Edition (2006). Article 2: General Obligations.

[421] Velders, J.M., Andersen, S.O., Daniel, J.S., Fahey, D.W. and M. McFarland. 2007. The Importance of the Montreal Protocol in protecting climate. http://www.pnas.org/content/104/12/4814.abstract

[422] Regulation (EC) No 3093/94.

8.8.7.2.3 Efficiency

2553. The cost-effectiveness of this sub-project was $17.94 ODP-kg per year, based on a *targeted* phase out of 112 ODP-tonnes of CFCs at Snaigė within the GEF budget of $2,009,162.

2554. The cost-effectiveness of the installation of CFC-free technology for domestic refrigerator production was compared with the cost-effectiveness of similar projects carried out in developing countries. The MLF financed the evaluation of 28 companies in 11 countries in Africa, Latin America and Asia, which was 20% of the total number of 144 refrigeration projects completed by February 2000. The average planned cost-effectiveness of these MLF-funded projects was $19.61 ODP-kg per year, which was adjusted to $21.69 ODP-kg per year as a result of the evaluation[423].

2555. The cost-effectiveness in this sub-project of the phase out of CFCs at Snaige in Lithuania at $17.94 ODP-kg per year was assessed as highly satisfactory, as this was 8.5% less than the MLF-funded planned average cost-effectiveness and about 17% less than the adjusted average cost-effectiveness of MLF-funded domestic refrigerator projects in 11 developing countries. The cost-effectiveness of Snaige is calculated without operating costs (about $0.94 million) which were not eligible under GEF operational guidelines and were paid by Snaige. The cost-effectiveness of MLF projects was calculated with operating costs, which therefore reduces the difference to less than 17%.

8.8.7.3 Assessment of sustainability of project outcomes

8.8.7.3.1 Financial resources

2556. Snaige had to undertake two conversion processes: 1) CFC-11 → R141b → cyclopentane-blown rigid polyurethane insulation foam in the doors and cabinets; and 2) CFC-12 → HFC-134a → R600a in the compressor. The GEF grant of $2,009,162 from 1996 to 2000 paid for all the conversions, except the first conversion in the foam insulation of CFC-11 → R141b. In that step, Snaigė was not able to fulfil the GEF criteria for retroactive financing for work completed before the start of the Project[424].

2557. The GEF funded the installation of the production lines, technology transfer, technical assistance, re-design, testing, pre-production trials and training, technical advisory services, capital equipment, training in plant safety, contingencies and project support services including monitoring-evaluation. The full capital cost for all of the conversion steps was $2,982,077. However, 16% was deducted due to exports to Western Europe, which reduced the GEF grant to $2,009,162. Operational costs of $246,113 over a 4-year period were calculated, but were not claimed as the GEF rules did not support such a claim. Snaigė declared $1,219,028 of co-finance.

2558. The elimination of ODS and replacement with non-ODS resulted in an increase in the production of refrigerators. The GEF grant enabled the company to put in place modern production and refrigeration technologies that improved competitiveness, increased production capacity, improved environmental compliance, improved manufacturing quality and working conditions, reduced production costs & labour, and reduced the energy demand of refrigerators. The 30% savings in energy consumption promoted sales of refrigerators on EU markets as purchasers could claim government-funded rebates e.g. Netherlands. The number of models increased from 7 (before 1997) to 25 after the Project.

2559. Considering the project was completed in February 2000 and that refrigerators have been produced since that time, the range of markets has expanded and number of models increased, the sub-project was evaluated as financially sustainable and the financial aspects of the sub-project were assessed as satisfactory.

8.8.7.3.2 Socio-political

2560. The main organisations that assisted the MoE/NOU and UNDP to implement this sub-project

---

[423] MLF. 2000. Final report on the 1999 evaluation of refrigeration projects and draft follow-up action plan. UNEP/OzL.Pro/ExCom/30/5. Annex 1, page 2: Overall Rating of Refrigeration Projects Evaluated.

[424] The GEF funding criteria did not permit the allocation of funds for conversion from one ODS (typically CFCs) to another ODS (typically HCFCs) as this was not regarded as sustainable. In addition, the GEF Strategy published in February 1997 permitted funding to be considered for costs incurred less than 12 months prior to the approval of the relevant sub-project, but only 15% of these costs could be financed retroactively.

converted Snaigė to CFC-free refrigerator production was the Customs Department (for the import of the production lines), and the suppliers of the production line equipment such as Elastogran and others that provided technical assistance, re-design, testing, pre-production trials and training, technical advisory services, capital equipment, and training in plant safety.

2561. The financial sector was beyond the control of many companies during the global economic crisis in 2008 and 2009. Despite the adverse conditions at that time, Snaige reported only a small reduction in refrigerator production in 2008 compared to 2007, which reflected the downturn in the economy. Snaigė exports up to 97% of its products to almost 40 countries around the world, many of them in Europe, which may have avoided much of the downturn. However, later in 2009 as the recession deepened, Snaigė halved its Lithuanian workforce to 700 and went to a 4 day working week[425]. In 2000 to 2007 Snaigė operated 24h/day for 5 days per week.

2562. For these reasons, the socio-political environment was assessed as satisfactory because the operations of Snaige had continued since the conversion of the facility to CFC-free domestic refrigerator production. However, of all the socio-political factors the largest impact on the company had come as a result of the economic crisis.

8.8.7.3.3 Institutional framework and governance

2563. The ability of Snaigė to continue to use CFCs for the production of refrigerators after the phase out of CFCs on 1 January 1996 in the Montreal Protocol dependent totally on whether or not the government of Lithuania continued to allow imports and use of CFCs. This was not to be the case.

2564. In 1996, Lithuania's Action Plan[426] included an environmental protection goal to reduce ODS by introducing legislation from 1996 to 1998 that would control ODS import, export and use. Legislation in 1999 introduced the requirement for a license to store ODS; import quotas for ODS; a ban on the use of CFCs for use in new refrigeration and air-conditioning equipment, in aerosols and in the production of foam; and restrictions on the use of methyl bromide.

2565. Although the ban on the import of CFCs was three years later than required under the Montreal Protocol for developed countries, the ban that was eventually implemented by Lithuania was supportive of the sub-project because it eliminated the option for sustainable production of domestic refrigerators using CFCs. Importantly, it laid the foundation for the CFC-free technology as the only viable alternative for ongoing production of domestic refrigerators.

2566. For these reasons, the performance of the institutional framework and governance in Lithuania in the implementation of this sub-project that converted Snaigė to the CFC-free domestic refrigerator production was assessed as satisfactory.

8.8.7.3.4 Environmental

2567. There were few environmental risks that were assessed as potentially undermining this work as cyclopentane (in the foam) and isobutane (in the compressor) are not ozone-depleting substances and they have an extremely low to negligible global warming impact. Therefore the use of hydrocarbons for aerosol production is not affected by legislation that targets ozone-depleting substances and global warming gases.

2568. However, the most significant factor in the use of hydrocarbons is the requirement for the installation of equipment and procedures that promote personnel safety. Facilities throughout the world have installed adequate safety equipment and procedures which, when adhered to by staff and management, have produced the bulk of the world's refrigerators. Safety features that have helped to avoid accidents during production include the use of a separate manufacturing building from the storage tanks containing hydrocarbons, installing a blast wall in between the flammable propellant charging rooms and other areas, providing a well-ventilated gas house under positive ventilation, installing discharge vents from vacuum and propellant pumps, and providing automatic sensing systems to measure flammable gas concentrations in areas where the hydrocarbon is stored and in the filling areas which are connected to alarms.

2569. Because of the flammability of hydrocarbons, the Fire Rescue Department in Lithuania assisted

---

[425] Financial Times. 20 April 2009.

[426] Decree No I-1550. 25 September 1996. Lithuanian Republic Parliament

the government to develop and enforce standards for domestic refrigerator production, and for storing and handling hydrocarbons at facilities such as Snaige. In addition to these codes and standards, there are other safety measures described above that are important and relevant.

8.8.7.4 Catalytic role

2570. Within Lithuania and even the Baltic countries Snaigė was the only domestic refrigerator producer. Therefore, within the Baltic region, there was no opportunity for other domestic refrigerator producers to finance their own conversion to CFC-free technology.

8.8.7.5 Achievement of outputs and activities

8.8.7.5.1 Delivered outputs

2571. There were no specific achievement or performance indicators that were developed for this sub-project. Effectiveness could be evaluated by assessing:

- Whether or not the refrigerator production was converted to CFC-free technology;
- The quantity of CFCs that were phased out as a result; and
- The impact that the conversion had on the refrigerator manufacturer's profitability.

The delivered outputs are discussed for each of them.

8.8.7.5.1.1 Conversion to CFC-free technology

2572. Snaigė successfully replaced CFCs with cyclopentane and isobutane in the production of domestic refrigerators. The project was initiated in 1996 and completed in 2000. The sub-project was considered as completed when the *Certificate of Completion* and the *Hand-Over Protocol* were issued by UNDP in February 2000.

2573. The CFC-free domestic refrigerator production installed at Snaigė has continued to operate for the past nine years. This demonstrated that the conversion to hydrocarbon technology was sustainable.

2574. The conversion to CFC-free technology was assessed as highly successful as the consumption of CFC-11 and CFC-12 for domestic refrigerator production were completely eliminated.

8.8.7.5.1.2 Quantity of CFCs phased out

2575. The installation at Snaigė of CFC-free technology for all remaining aspects of its domestic refrigerator production that included the elimination of CFCs in the manufacture of foam resulted in the elimination the use of 112 ODP-tonnes of CFC-11 and CFC-12 used for this purpose per year. The elimination of this quantity of all CFCs was significant as they constituted 29% of the CFCs used in Lithuania in 1995.

2576. The conversion to CFC-free technology was assessed as highly successful as the sub-project succeeded in eliminating the Project target of 112 ODP-tonnes of CFC-11 and CFC-12 for domestic refrigerator production in Lithuania.

8.8.7.5.1.3 Impact of the conversion on enterprise profitability

2577. The replacement of CFCs and HCFCs with non-ODS technology resulted in a significant increase in the production of refrigerators at Snaigė (Figure 35).

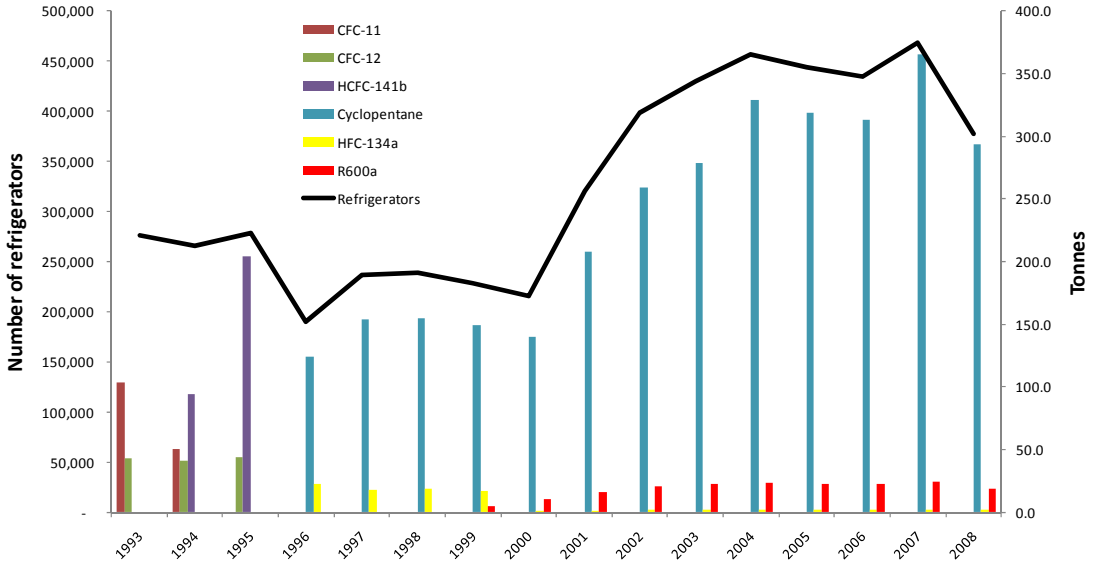


Figure 35: Number of refrigerators produced by Snaigė using CFC-11, CFC-12, HCFC-141b, cyclopentane, HFC-134a and R600a (in tonnes) in each year from 1993 until 2008

2578. Snaigė acknowledged that the GEF funding enabled the company to put in place modern production and refrigeration technologies that improved competitiveness, increased production capacity, improved environmental compliance, improved manufacturing quality and working conditions, reduced production costs & labour, and reduced the energy demand of refrigerators. The 30% savings in energy consumption promoted sales of refrigerators on EU markets as purchasers could claim government-funded rebates e.g. Netherlands. The number of models increased from 7 (before 1997) to 25 after the Project.

2579. Snaigė exports up to 97% of its products to almost 40 countries around the world. Since the Project was completed and in 2002, Snaigė purchased five other similar companies in the Russian Federation and Ukraine[427]. Although the company's production capacity is 650,000 refrigerators per year, about 377,000 units were produced in 2008 and it expected to manufacture about 200,000 units in 2009.

2580. The installation of the CFC-free technology was assessed as highly successful as and a major factor that contributed to an increase in the number of domestic refrigerators sold, to an increase in the number of models and to improved market opportunities.

8.8.7.5.2 Awareness about ODS, ODS substitute technology, and strengthening of institutional capacities for dealing with ODS phase-out

2581. Details on the extensive work carried out in Lithuania to increase the awareness of ozone layer depletion were provided in Section 8.8.4.5.1.2 above. The work on ODS substitute technology was focused on three enterprises, including the domestic refrigerator production company Snaigė which was one of the major consumers of CFCs in Lithuania at that time.

2582. Hydrocarbons became the dominant technology in domestic refrigerator production in many developed and developing countries, following the ban on the use of CFCs. Hydrocarbons as replacements for CFCs would have been well-known to experienced and sophisticated domestic refrigerator production companies such as Snaigė.

2583. The NOU was established in 2002 and after the completion of this sub-project. The institutional capacity available at that time that assisted in the implementation of this project was the MoE (links to international funding bodies), the Customs Department (import of hydrocarbon technology for domestic refrigerator production), and the Fire Rescue Department in Lithuania that provided advice and enforced standards related to the use of hydrocarbons for domestic refrigerator production, and for storing and handling hydrocarbons.

[427] "Techprominvest" in Kaliningrad in 2002, which also contained GEF-funded equipment salvaged from Calex (Slovakia) when Calex went bankrupt; "Snaigė Ukraine" in 2002; "Moroz Trade" in Moscow 2004; "Liga-servis" in Russia in 2005; and "Almecha" in Lithuania in 2006.

2584. Elastogran as one of the main companies that provided and installed the equipment, and that provided training and advice on hydrocarbon safety, was one of the most important contributors to the success of the sub-project. Snaigė commented that they would have preferred a direct conversion from CFCs to cyclopentane in the foam insulation, rather than via an intermediate step of HCFC-141b. Snaigė contended that a single rather than two steps would have been more economical and less disruptive to their production system.

8.8.7.5.3 Authority / credibility, necessary to influence policy and decision-makers

2585. The MoE cooperated with a diverse range of government bodies in Lithuania that were involved in sub-projects that replaced ODS (see paragraph 2457 above), such as this sub-project on the replacement of CFCs for domestic refrigerator production.

2586. In 1996, Lithuania's Action Plan[428] included an environmental protection goal to reduce ODS by introducing legislation from 1996 to 1998 that would, *inter alia*, ban the use of CFCs for use in the production of domestic refrigerators. Further information on the key policy and decision-makers was provided in Section 8.8.6.3.3 "*Institutional framework and governance*" above.

2587. The MoE cooperated with international funding bodies relevant to this CFC phase out project (GEF, UNDP) to develop the Project Document, the Customs Department to facilitate the import of hydrocarbon technology for aerosol production, and the Fire Rescue Department for advice on standards related to the manufacture and storage of domestic refrigerators, and for storing and handling hydrocarbons.

2588. The MoE staff were assessed as well-qualified to carry out tasks related to the installation of CFC-free technology for domestic refrigerator production at Snaigė due to a combination of political, technical and administrative expertise.

8.8.7.6 Assessment of monitoring and evaluation systems

8.8.7.6.1 Monitoring and evaluation design

2589. The GEF specified in the Project Document that the budget was to cover, *inter alia … project support services / monitoring-evaluation.* Apart from this statement, there was no specific design for monitoring and evaluation. There was no other statement by UNDP of the M&E design.

8.8.7.6.2 Monitoring and evaluation plan implementation

2590. There was no evidence of the implementation of an M&E plan by UNDP. There was reference only to the issuance of the *Certificate of Completion* and the *Hand Over Protocols* in February 2000.

8.8.7.6.3 Budgeting and Funding for monitoring and evaluation activities

2591. There was no information available on the budgeting and funding of the monitoring and evaluation activities.

8.8.7.6.4 Long-term monitoring

2592. Long-term monitoring was not envisaged in this sub-project, because Snaigė was 'locked' into hydrocarbon technology once it had been converted to manufacture only CFC-free domestic refrigerator. CFCs were also no longer obtainable because they had been banned several years earlier by the government of Lithuania. The enterprise also reported better marketing opportunities with hydrocarbon technology than when CFCs were used in the production line.

8.8.7.7 Assessment of processes that affected attainment of project results

8.8.7.7.1 Preparation and readiness

2593. The Project Document was signed by UNDP on 5 May 1998 and the project was completed in February 2000 1.75 years later. As the project was closed in 2000, the new production lines technology was most likely to have been installed at Snaigė in 1998 or 1999. The MoE assumed the lead for activities on ozone protection until the NOU was established within the MoE in

[428] Decree No I-1550. 25 September 1996. Lithuanian Republic Parliament

2002, which was after the Snaigė sub-project was finished.

2594. The MoE and Snaigė were assessed as prepared and ready for this sub-project as the import of CFCs had been banned in legislation that came into force from 1996 to 1998. Snaigė used CFCs for the last time in 1995, and therefore it anticipated very well the ban by the government. The ban on the import of CFCs fully committed Snaigė to CFC-free technology for the production of domestic refrigerators.

8.8.7.7.2 Country commitment and motivation

2595. There was no delay between the signing of the Project Document, tendering and procurement of the domestic refrigerator production lines that used CFC-free technology, the installation of this equipment and the closing of the project. Hydrocarbon technology had been used in many plants worldwide for the production of domestic refrigerators at that time[429], so Snaigė would have been supportive of the change. In addition, Lithuania had banned the import of CFCs in legislation that came into force from 1996 to 1998, prior to the start of the sub-project. These activities were assessed as indicating that Lithuania was committed and motivated to eliminate the use of CFCs in aerosol production.

8.8.7.7.3 Stakeholder involvement

2596. The main stakeholders were the MoE that cooperated with international funding bodies relevant to this CFC phase out project (GEF, UNDP) to develop the Project Document; the Customs Department to facilitate the import of hydrocarbon technology for domestic refrigerator production; the Fire Rescue Department for advice on standards related to the use and storage of hydrocarbons; Snaigė as the company that operated the domestic refrigerator production facility; Elastogran as one of the main companies that installed, tested and trained staff in the safe use of the hydrocarbon technology; and UNDP that tendered and procured the equipment for the sub-project.

2597. The stakeholder involvement that were formed as a result of the sub-project were assessed as creating satisfactory stakeholder partnerships that progressed work on the conversion from CFC to hydrocarbon domestic refrigerator production at Snaigė.

8.8.7.7.4 Financial planning

2598. UNEP reported that the budget and fund management in the Institutional Strengthening sub-project were … *progressing according to budget, funds are wisely spent and correctly and transparently accounted for and accounting kept up to date*. The evaluators presumed that budget and expenditure control were similar in this UNDP sub-project, as there were no reports available by UNDP on financial planning.

8.8.7.7.5 UNDP supervision and support

2599. Snaigė expressed satisfaction with the performance of UNDP in this sub-project. Snaigė said that UNDP experts performed very well in all stages including problem identification and solutions, procurement, liaison and coordination. On this basis, the evaluation team assessed UNDP supervision and support as highly satisfactory.

8.8.7.7.6 Co-financing and project outcomes & sustainability

2600. GEF funding of $2,009,162 over 1.75 years was provided for the production lines, technology transfer, technical assistance, re-design, testing, pre-production trials and training, technical advisory services, capital equipment, training in plant safety, contingencies and project support services including monitoring-evaluation. The full capital cost for all of the conversion steps was $2,982,077. However, 16% was deducted due to exports to Western Europe, which reduced the GEF grant to $2,009,162. Operational costs of $246,113 over a 4-year period were calculated, but were not claimed as the GEF rules did not support such a claim. Snaigė declared $1,219,028 of co-finance.

2601. Provision of co-finance by Snaigė was assessed as a significant contributor toward ensuring the sustainability of the conversion of Snaigė from CFC to hydrocarbon technology after the sub-

429 The MLF Executive Committee approved a refrigerator project in Chile in June 1992. UNEP/OzL.Pro/ExCom/30/5

project was concluded. A successful company will usually invest funds only in areas that have the prospects for recovery of investment costs over time, which can only be regained if the operations continue after company funds have been spent on the investment. Snaigė reported that the 30% savings in energy consumption that had been gained as a result of the conversion to CFC-free technology encouraged EU consumers to purchase Snaigė refrigerators, as they could claim government-funded rebates e.g. Netherlands. Increased sales would have enabled the company to recoup on the costs of its investment. The number of models increased from seven (before 1997) to 25 after the Project.

8.8.7.7.7 Project implementation delays and impact on project outcomes & sustainability

2602. There was virtually no delay in the implementation of this project. According to Snaigė, the sustainability of the project was due to the three factors:

- *Improved competiveness* of the company on international markets using the CFC-free technology,
- *Improved environmental performance*, as ozone-depleting substances were no longer used in the manufacture of the refrigerators, which was reported to be important to the consumer; and
- *Significant reduction in energy consumption,* which was very important to the consumer that wanted to be able to claim rebates from the government for the purchase of energy efficient appliances.

8.8.7.8 Sub-Project Rating

LIT/97/G34 Elimination of the use of CFCs in the manufacture of domestic refrigerators and freezers at Snaige (UNDP/UNOPS)		
Criterion	**Evaluator's Summary Comments**	**Evaluator's Rating**
Attainment of project objectives and results Sub criteria (in yellow below)	See comments below	HS
Effectiveness	CFCs phased out in less time than originally estimated; about 29% of the CFCs in Lithuania eliminated at that time; improved refrigerator marketability due to 30% better energy performance among other factors	HS
Relevance	Conversion to non-ODS technology is consistent with minimising the detrimental effect of ODS on the ozone layer, compliance with the Montreal Protocol, harmonisation with EU legislation on accession, and reduces impact on climate	HS
Efficiency	Cost effectiveness was 8.5% less than the MLF-funded *planned* average cost-effectiveness and about 17% less than the *adjusted* average cost-effectiveness of MLF-funded domestic refrigerator projects in 11 developing countries	HS
Sustainability of Project outcomes (overall rating) Sub criteria (in yellow below)	See comments below	HS

LIT/97/G34 Elimination of the use of CFCs in the manufacture of domestic refrigerators and freezers at Snaige (UNDP/UNOPS)		
Criterion	**Evaluator's Summary Comments**	**Evaluator's Rating**
Financial	Completed in February 2000; production since that time; the range of markets has expanded; and the number of models increased.	HS
Socio-Political	Operations continued even in during the global economic recession, but at a reduced production level; socio-political environment favorable to sustained production; company diversified by purchasing similar companies in other countries	HS
Institutional framework and governance	Timely elimination of CFCs by Snaige in 1995 that preceded the government import ban in 1996; effective institutional framework and governance	HS
Environmental	Few environmental risks as hydrocarbons, although subject to strict safety standards and codes, are not the subject of ODS and climate gas legislation	HS
Achievement of outputs and activities		HS
Monitoring and Evaluation (overall rating) Sub criteria (in yellow below)	See below	U
M&E Design	UNDP M&E design was not evident	U
M&E Plan Implementation (use for adaptive management)	UNDP M&E plan implementation was not evident	U
Budgeting and Funding for M&E activities	UNDP M&E budget and expenditure on M&E was not evident	U
Catalytic Role	No categorisation required	
Preparation and readiness	MoE (legislation in place to ban CFCs) and Snaigė (already started the conversion on some lines) were both prepared and ready	HS
Country commitment and motivation*	Worldwide acceptance of hydrocarbon technology by Snaige; CFC ban in place. Both as evidence that Lithuania was committed and motivated.	HS
Stakeholders' involvement	MoE, Customs, Fire Rescue Department and UNDP worked well together and succeded	HS
Financial planning	No information for this project, but other projects in Lithuania were carried out to	S

LIT/97/G34 Elimination of the use of CFCs in the manufacture of domestic refrigerators and freezers at Snaige (UNDP/UNOPS)		
Criterion	**Evaluator's Summary Comments**	**Evaluator's Rating**
	professional financial standards	
UNEP supervision and support**	Snaigė said that UNDP experts performed very well in all stages including problem identification and solutions, procurement, liaison and coordination.	HS
Overall Rating		HS

Highly Satisfactory (HS); Satisfactory (S); Moderately Satisfactory (MS); Moderately Unsatisfactory (MU); Unsatisfactory (U); Highly Unsatisfactory (HU);
*Motivation replaced TOR '*driveness*'; **Support replaced TOR 'backshopping'

8.8.8 LIT/97/G35 Conversion of the manufacturing facility at ORUVA to enable mass production of HFC-134a compressors (UNDP/UNOPS)

8.8.8.1 Introduction

2603. Oruva produced CFC compressors for domestic refrigerators and was 84% privately owned. In 1996, more than 2,600 worked at the 4.6 ha factory in Lithuania that had a capacity of 1.2 million compressors annually.

2604. The GEF provided $1,728,500 of financial assistance to replace CFC compressor production technology with CFC-free technology. The enterprise / government declared $1,851,296 of co-finance. The Project Document was signed by UNDP on 5 May 1998, the equipment for CFC-free compressor production was installed by December 2000 and the project was completed in June 2003.

2605. The project resulted in a direct phased out 20 ODP-tonnes of CFC-113 used as a solvent, and an indirect phase out of 245 ODP-tonnes due to the elimination of CFCs in the production of domestic refrigerators.

2606. UNDP reported that Oruva was being managed by a Bankruptcy Administrator in 2001. Oruva again entered bankruptcy procedures[430] in 2009 and the liquidation of the company had commenced. Because of the ongoing bankruptcy procedures it was difficult to obtain information on this sub-project funded by the GEF.

8.8.8.2 Attainment of objectives and planned results

8.8.8.2.1 Effectiveness

2607. There were no specific achievement or performance indicators that were developed for this sub-project. Effectiveness could be evaluated by assessing:

- Whether or not CFC-free compressor production lines were installed;
- The quantity of CFCs that were phased out as a result; and
- The impact that the conversion had on Oruva's profitability and sustainability.

2608. The achievement of outputs and activities by Lithuania in this sub-project on the conversion of compressor production to CFC-free technology, as measured against these performance indicators, are provided in Section 8.8.8.5.1 "*Delivered outputs*" below.

2609. On this basis, and also in consideration of the deliverables described in Section 8.8.8.5.1, the effectiveness of the conversion of compressor production to CFC-free technology at Oruva was assessed as moderately satisfactory.

8.8.8.2.2 Relevance

2610. Reduced emissions of ODS in Lithuania as a result of the conversion of the compressor

[430] Court Proceedings of 24-09-2008, which came into force on the 07-10-2008.

production facility to CFC-free technology at Oruva is consistent with the objectives of the Vienna Convention and the Montreal Protocol, which *requires Parties to take appropriate measures in accordance with the provisions of this Convention and of those Protocols in force to which they are party to protect human health and the environment against adverse effects resulting or likely to result from human activities which modify or are likely to modify the ozone layer*[431].

2611. As a result of the successful implementation of this sub-project by Oruva, approximately 20 ODP-tonnes of CFCs were eliminated per year. This consumption was equivalent to about 5% of the ODS consumed in Lithuania in 1995. Phasing out this quantity of CFCs avoided this quantity of annual emissions and potential damage to the ozone layer.

2612. The GEF established in 1995 an Ozone Layer Depletion Focal Area in response to the Montreal Protocol. The Focal Area has the strategic objective of protecting human health and the environment by assisting countries to phase out their consumption and production of ODS, to prevent emissions of ODS, and to encourage the uptake of alternative technologies and practices according to a country's commitments under the Montreal Protocol. The financial interventions in the GEF Focal Area contribute to the return of the ozone layer to pre-1980 ozone levels, which is expected by 2065.

2613. Most recently, the dual capability of ODS to both reduce ozone and to have a detrimental impact on the climate have been described[432]. Global ODS consumption in 1989 was equivalent to about 9,200 million tonnes (9 Gt) CO_2-eq/year, which was reduced to about 1,870 million tonnes (1.8 Gt) CO_2-eq/year in 2007 as a result of ODS phase-out activities under the Montreal Protocol. This reduction of about 7 Gt CO_2-eq/year was at least three times greater than the Kyoto Protocol's reduction target (about 1-2 Gt CO_2-eq/year in 2008-2012), demonstrating that the global ODS reductions achieved so far have already yielded a larger climate benefit than the current Kyoto Protocol target.

2614. The implementation of CFC-free compressor production technology was important for Lithuania's compliance with the Montreal Protocol, which required no consumption of CFCs from 1 January 1996 in developed countries such as Lithuania. In addition, elimination of the consumption of CFCs was important to Lithuania's accession to the EU in May 2004. The EU had banned the use of CFCs in 1994 for all uses[433], and therefore Lithuania's replacement of the CFCs in 2000 was consistent with action that had been taken by the EU six years previously.

2615. The actions taken by Lithuania to install CFC-free compressor production technology at Oruva was therefore relevant to further protection of the ozone layer, compliance with the Montreal Protocol, accession to the EU, and important for reducing the impact of radiative forcing of the climate (Kyoto Protocol).

8.8.8.2.3 Efficiency

2616. The GEF provided $1,728,500 of financial assistance to replace CFC compressor production technology with CFC-free technology. The project phased out 20 ODP-tonnes of CFCs. In the domestic refrigeration compressor sector, the MLF did not consider the quantity of ODS phased-out (except for small amounts of direct ODS phase-out related to solvents) because this would have resulted in double counting with the numerous domestic refrigeration projects approved and implemented at the time[434].

2617. Therefore, it was not considered relevant to calculate the cost-effectiveness of the replacement of CFC compressor production technology with CFC-free technology at Oruva. The amount of expenditure on the elimination of CFC-113 was not available, which prevented calculation of the cost-effectiveness for this component of the sub-project.

2618. In terms of funds approved per project, five of 26 completed compressor projects examined by the MLF 14 (54%) had funding levels of less than $1 million, five (19%) from $1 to $2 million, and seven (27%) more than $2 million. In terms of size, the Oruva sub-project was within the $1 to

---

[431] Handbook for the Vienna Convention for the Protection of the Ozone Layer - 7th Edition (2006). Article 2: General Obligations.

[432] Velders, J.M., Andersen, S.O., Daniel, J.S., Fahey, D.W. and M. McFarland. 2007. The Importance of the Montreal Protocol in protecting climate. http://www.pnas.org/content/104/12/4814.abstract

[433] Regulation (EC) No 3093/94.

[434] MLF. 2001. Evaluation of completed compressor projects in China. UNEP/OzL.Pro/ExCom/34/17. Footnote to Annex 1 on page 15.

$2 million range and 19% of the MLF-funded projects that had been completed at the time of the MLF evaluation.

2619. In terms of the time taken to complete the projects, only a minority of the MLF-funded compressor projects in developing countries were completed on time and some were delayed by 2 years or more[435]. In the case of the Oruva sub-project, it was approved on 5 May 1998, the equipment for CFC-free compressor production was installed by December 2000 and the project was completed in June 2003. The Oruva sub-project was due for completion in 2 years according to the Project Document (May 2000). Therefore, there was a three year delay in completing the Oruva sub-project.

8.8.8.3 Assessment of sustainability of project outcomes

8.8.8.3.1 Financial resources

2620. At the time of the project formulation, Oruva had already invested its own funds to produce HFC-134a and HC-600a compressors on a small scale. This first phase of the project was already well underway when the UNDP consultants visited the plant, and therefore could not be claimed retroactively under the GEF rules.

2621. The GEF agreed to fund Phase 2 of the project to enable Oruva to produce HFC-134a and HC-600a compressors on a large scale. The total capital cost of Phase 1 & 2 was $3,579,796 but only Phase 2 cost of $1,728,500 was eligible. This budget covered the provision of technical advisory services, capital equipment items, training, contingencies and project support services including monitoring-evaluation. Operational costs were not calculated as they were not eligible under the GEF rules. Oruva declared $1,851,296 as co-finance which it had paid for Phase 1.

2622. There were considerable financial risks that jeopardized the sustainability of the installation of CFC-free compressor production technology at Oruva.

2623. The World Bank[436] advised that compressor manufacturing companies in general … *should lower their production cost, ensure product quality, and extend the market, to ensure that the estimated objective can be achieved*. Furthermore, because of fierce market competition in the compressor sector, the sub-project at Oruva should have been *finished and put into production as early as possible*. Because Oruva entered bankruptcy on more than one occasion in the past 10 years, this indicated that many of the qualities that were needed to successfully penetrate the compressor market, such as those described by the World Bank, were not in place.

2624. Based on the number of times Oruva entered bankruptcy, it was most likely that the finances of the company were marginal before the global economic crisis in 2008/2009. Once the crisis eventuated, this became *the last straw* for Oruva as it was not sufficiently strong financially entering into the crisis and it went bankrupt again.

8.8.8.3.2 Socio-political

2625. The main organisations that assisted the MoE/NOU and UNDP to implement this sub-project converted Oruva to CFC-free compressor production technology was the Customs Department (for the import of the production lines); the suppliers of the production line equipment that provided technical assistance, re-design, testing, pre-production trials and training, technical advisory services, capital equipment.

2626. In addition to these organisations, the Bankruptcy Administration became involved when it became clear that the company was no longer financially solvent. Further details on the results of this visit are provided in Section 8.8.8.6.2 that discusses the UNDP "*Monitoring and evaluation plan implementation*".

2627. There were therefore few socio-political risks affecting the sustainability of the company. The main factor was the company remaining competitive in a very fierce international market.

8.8.8.3.3 Institutional framework and governance

2628. The ability of Oruva to continue to use CFCs for the production of compressors after the phase out of CFCs on 1 January 1996 in the Montreal Protocol dependent totally on whether or not the

[435] MLF. 2000. Desk study on compressor projects. UNEP/OzL.Pro/ExCom/31/17. Page 2.
[436] MLF. 2000. Desk study on compressor projects. UNEP/OzL.Pro/ExCom/31/17. Page 3.

government of Lithuania continued to allow imports and use of CFCs. This was not to be the case.

2629. In 1996, Lithuania's Action Plan[437] included an environmental protection goal to reduce ODS by introducing legislation from 1996 to 1998 that would control ODS import, export and use. Legislation in 1999 introduced *inter alia* the requirement for a license to store ODS; import quotas for ODS; and a ban on the use of CFCs for use in new refrigeration and air-conditioning equipment.

2630. Although the ban on the import of CFCs was three years later than required under the Montreal Protocol for developed countries, the ban that was eventually implemented by Lithuania was supportive of the sub-project because it eliminated the option for the production of compressors that were based on CFCs. Importantly, it laid the foundation for the CFC-free technology as the only viable alternative for the sustainable production of compressors at Oruva.

2631. The ban on the import and use of CFCs, and the support of key institutions in Lithuania, indicated a satisfactory institutional framework and governance.

8.8.8.3.4 Environmental

2632. There were some environmental risks that were assessed as having the potential to undermine this work. HFC-134a and HC-600a are not ozone-depleting substances and therefore they are not affected by legislation that targets such substances. However, HFC-134a has a relatively high Global Warming Potential (GWP) that is 1,300 times more than carbon dioxide. Moreover, HFC-134a is a greenhouse gas which is controlled by legislation in the EU[438]. As a hydrocarbon, HC-600a has a small to negligible GWP and is not controlled by greenhouse gas legislation. The compressors were not filled with hydrocarbons on site and therefore there were no special precautions that needed to be taken.

8.8.8.4 Catalytic role

2633. Within Lithuania and even the Baltic countries Oruva was the only compressor manufacturer. Therefore, within Lithuania and the Baltic region generally, there was no opportunity for other compressor producers to finance their own conversion to CFC-free technology.

8.8.8.5 Achievement of outputs and activities

8.8.8.5.1 Delivered outputs

2634. There were no specific achievement or performance indicators that were developed for this sub-project. Effectiveness could be evaluated by assessing the delivered outputs such as:

- Whether or not CFC-free compressor production lines were installed;
- The quantity of CFCs that were phased out as a result; and
- The impact that the conversion had on Oruva's profitability and sustainability.

8.8.8.5.1.1 Installation of CFC-free compressor manufacturing technology

2635. UNDP reported that the technology for the production of CFC-free compressors had been installed and completed by December 2000. After the declaration of bankruptcy by Oruva in 2001, trials were successfully performed and completed by the new owner of Oruva in December 2002. The UNDP/UNOPS sector expert visited the project and ascertained that it was satisfactorily completed in June 2003. The conversion to CFC-free technology was assessed as successful as the consumption of CFC-12 for compressor production may have been completely eliminated.

2636. The evaluators were uncertain of complete elimination because many compressor companies worldwide maintained the ability to produce CFC-compressors to meet the servicing demand, which could have been the case with Oruva. It was not possible for the evaluation team to obtain further information on this aspect.

---

[437] Decree No I-1550. 25 September 1996. Lithuanian Republic Parliament

[438] Regulation (EC) 842/2006 on Certain Fluorinated Gases.

8.8.8.5.1.2 Phase out of CFCs

2637. As described in paragraph 2616 above, the quantity of ODS phased-out as a result of the installation of CFC-free compressor manufacturing technology at Oruva was not counted because this would have resulted in double counting with domestic refrigeration projects approved and implemented at the time. Therefore, it was not considered relevant to calculate the cost-effectiveness of the replacement of CFC compressor production technology with CFC-free technology at Oruva.

2638. The amount of expenditure on the elimination of 20 ODP-tonnes of CFC-113 as a solvent at Oruva was not available because the company was under Bankruptcy Administration, which precluded calculation of the cost-effectiveness for this component of the sub-project.

8.8.8.5.1.3 Impact of the conversion to CFC-free technology

2639. Before the Project started, Oruva had already converted the factory to allow small-scale production of HFC-134a and HC-600a compressors. The number of units per year had been reduced by 87% in 3 years – that is, from 1,058,000 in 1993 to 136,000 in 1996. About 85% of the production in 1996 was exported to Ukraine, Bulgaria, the Baltic countries and the Caribbean.

2640. The company had gone into liquidation on at least two occasions since the installation of the technology to produce CFC-free compressors. The World Bank had reported to the MLF[439] as a result of their experience in compressor projects that … *a powerful and creative leader was necessary*… as well as a … *stable, cooperative, active and united lead team steered by capable individuals is the key factor to successful project implementation*. UNDP had reported that Oruva had been declared bankrupt in January 2001, which was more than 2 years before the project was completed. The evaluators assumed from this that Oruva did not have in place the team qualities described by the World Bank above.

2641. Because Oruva was under Bankruptcy Administration at the time of our evaluation, it was not possible to obtain further information on this aspect.

8.8.8.5.2 Awareness about ODS, ODS substitute technology, and strengthening of institutional capacities for dealing with ODS phase-out

2642. Details on the extensive work carried out in Lithuania to increase the awareness of ozone layer depletion were provided in Section 8.8.4.5.1.2 above. The work on ODS substitute technology was focused on three enterprises, including Oruva which manufactured CFC-compressors.

2643. The alternatives of HFC-134a and HC-600a as refrigerants for the compressors had already been selected by Oruva. Oruva had produced both CFC-free compressors on a small scale before the project started, but it needed finance to expand the production to reduce the individual compressor cost. Therefore Oruva was assessed as having known about the ODS substitute technology before this sub-project commenced.

2644. In regard to institutional strength, the NOU was established in 2002 which was after the CFC-free compressor manufacturing technology had been installed at Oruva. The institutional capacity available at the beginning of the sub-project was the MoE (links to international funding bodies), the Customs Department (import of hydrocarbon technology for domestic refrigerator production), and the Fire Rescue Department in Lithuania that provided advice and enforced standards related to the use of hydrocarbons for domestic refrigerator production, and for storing and handling hydrocarbons. Therefore, the strength of the institutions was present at the beginning of the sub-project, but increased in strength when the NOU was established toward the end of the sub-project.

8.8.8.5.3 Authority / credibility, necessary to influence policy and decision-makers

2645. The MoE cooperated with a diverse range of government bodies in Lithuania that were involved in sub-projects that replaced ODS (see paragraph 2457 above), such as this sub-project on the replacement of CFCs for compressor production.

---

[439] MLF. 2000. Desk study on compressor projects. UNEP/OzL.Pro/ExCom/31/17. Page 3.

2646. In 1996, Lithuania's Action Plan[440] included an environmental protection goal to reduce ODS by introducing legislation from 1996 to 1998 that would, *inter alia*, ban the use of CFCs for use in the production of compressors. Further information on the key policy and decision-makers was provided in Section 8.8.6.3.3 "*Institutional framework and governance*" above.

2647. The MoE cooperated with international funding bodies relevant to this CFC phase out project (GEF, UNDP) to develop the Project Document, the Customs Department to facilitate the import of hydrocarbon technology for aerosol production, and the Fire Rescue Department for advice on standards related to the manufacture and storage of domestic refrigerators, and for storing and handling hydrocarbons.

8.8.8.6 Assessment of monitoring and evaluation systems

8.8.8.6.1 Monitoring and evaluation design

2648. The GEF specified in the Project Document that the budget was to cover, *inter alia … project support services / monitoring-evaluation.* Apart from this statement, there was no specific design for monitoring and evaluation. There was no other statement by UNDP of the M&E design.

8.8.8.6.2 Monitoring and evaluation plan implementation

2649. There was some evidence of the implementation of an M&E plan by UNDP. In May 2001, UNDP staff[441] visited the Oruva with the NOU from Lithuania, and learnt that the company was under Bankruptcy Administration. The company had been advertised as for sale. The former management of Oruva had registered the CFC-free compressor production equipment as part of Oruva's assets, whereas in practice it remained the property of UNDP until such time that the Hand-Over Protocol was signed. UNDP agreed to only sign the Hand-Over Protocol once a new company had been identified and, if this was not possible, the NOU agreed to assist with returning the funds to UNDP for the compressor equipment that had been installed.

2650. In a report that was produced in 2003, UNDP made reference in the report to *the project being completed* in June 2003, but it was not clear whether this included processing the *Certificate of Completion* and the *Hand-Over Protocol*.

8.8.8.6.3 Budgeting and Funding for monitoring and evaluation activities

2651. There was no information available on the budgeting and funding of the monitoring and evaluation activities.

8.8.8.6.4 Long-term monitoring

2652. Long-term monitoring was not envisaged in this sub-project, assuming that Oruva was 'locked' into hydrocarbon technology once it had been converted to manufacture only CFC-free compressors.

2653. This may not have been the case. The MLF reported that in the late 1990s there was still a still *some production of CFC-based refrigerators*, *and there is an important demand for servicing the existing CFC-based refrigerators in case of compressor breakdown*[442]. New production of compressors in China as well as the expansion of existing ones led to doubts on the ability of all companies to survive the competition. Some companies continued to make CFC compressors as they were easier and cheaper to produce than the HFC-134a compressors. Compressor manufacturing companies in China exceeded the China's target of a limit of 40% CFC-compressor production to the extent that one company was still manufacturing 87% of its compressors to operate on CFCs, despite the MLF funding to manufacture CFC-free compressors.

2654. As undertaken by the MLF that examined three Chinese compressor manufacturers in detail, it would have been useful to validate that Oruva manufactured only CFC-free compressors. This assertion is warranted since the website[443] of Oruva in 2009 offered for sale …*compressors with*

---

[440] Decree No I-1550. 25 September 1996. Lithuanian Republic Parliament

[441] Mr Mahir Aliyev (Associate Portfolio Manager, UNDP), Mr Risto Ojala (UNDP aerosol expert), Ms Cihan Sultanoglu (UNDP resident respresentative), and Mr Darius Kontvainis (UNDP administrative officer)

[442] MLF. 2001. UNEP/OzL.Pro/ExCom/34/17. Paragraph 24 page 7.

[443] www.randburg.com/li/oruva.html

R12 and R134a refrigerants ...

8.8.8.7 Assessment of processes that affected attainment of project results

8.8.8.7.1 Preparation and readiness

2655. The Project Document was approved in May 1998. UNDP reported that the technology for the production of CFC-free compressors had been installed and completed by December 2000. After the declaration of bankruptcy by Oruva in 2001, trials were successfully performed and completed by the new owner of Oruva in December 2002. The UNDP/UNOPS sector expert visited the project and ascertained that it was satisfactorily completed in June 2003. The MoE assumed the lead for activities on ozone protection until the NOU was established within the MoE in 2002, which was one year after the Oruva sub-project was finished.

2656. The MoE and Oruva were assessed as prepared and ready for this sub-project as the import of CFCs had been banned in legislation that came into force from 1996 to 1998. When the project formulators first arrived at the facility, Oruva had already completed small scale production of HFC-134a and HC-600a compressors.

2657. As the legislation was in place that banned CFC import and use, and Oruva had already produced CFC-free compressors, the MoE and Oruva were assessed as prepared and ready for the this sub-project.

8.8.8.7.2 Country commitment and motivation

2658. There was very delay between the signing of the Project Document, tendering and procurement of the technology for CFC-free production of compressors, the installation of this equipment and the closing of the project. There was a 2.5 year delay between when the equipment was installed in December 2000 and the sign off of completeness by UNDP in June 2003, as it had to be tested and run by a new owner that purchased Oruva after January 2001 when Oruva declared bankruptcy. The delay in the second period was considered by the evaluators to be beyond the control of the government.

2659. HFC-134a was first approved by the MLF as a replacement for CFC-12 in compressors in developing countries in June 1993, and many other approvals were forthcoming shortly after this date. The conversion was therefore well-known to compressor manufacturers, as indeed it was to Oruva as they had manufactured both HFC-134a and HC-600a compressors on a small scale. Lithuania had banned the import of CFCs in legislation that came into force from 1996 to 1998, prior to the start of the sub-project.

2660. As the legislation was in place that banned CFC import and use, and Oruva had already produced CFC-free compressors, the MoE and Oruva were assessed as having a satisfactory level of commitment and motivation in this sub-project.

8.8.8.7.3 Stakeholder involvement

2661. The main stakeholders were the MoE that cooperated with international funding bodies relevant to this CFC phase out project (GEF, UNDP) to develop the Project Document; the Customs Department to facilitate the import of hydrocarbon technology for domestic refrigerator production; the Fire Rescue Department for advice on standards related to the use and storage of hydrocarbons; Oruva as the company that operated the compressor production facility; the companies that installed, tested and trained staff in the safe use of the hydrocarbon technology; and UNDP that tendered and procured the equipment for the sub-project.

2662. The stakeholder involvement that were formed as a result of the sub-project were assessed as creating satisfactory stakeholder partnerships that progressed work on the conversion from CFC to hydrocarbon domestic refrigerator production at Oruva.

8.8.8.7.4 Financial planning

2663. There was no report on the expenditure versus budget in this sub-project. In the visit by UNDP to Lithuania in May 2001, there was a short reference to premature asset ownership of UNDP property by Oruva but no other reference to funding management.

8.8.8.7.5 UNDP supervision and support

2664. In May 2001, UNDP staff[444] visited Oruva with the NOU, which indicated a level of supervision and support in this sub-project (see paragraph 2649 for further details). At this meeting, UNDP suggested activities that would need to be undertaken by the new owners of Oruva before the equipment could be transferred from UNDP to company ownership. UNDP was supportive of the action proposed by the NOU.

2665. These actions by UNDP were assessed as contributing a satisfactory level of supervision and support in this sub-project. However, there was no evidence of advice from UNDP for Oruva to …. *lower their production cost, ensure product quality, and extend the market, to ensure that the estimated objective can be achieved*[445]. Earlier advice to Oruva, and more precise assessment of their financial situation prior to the funding of the sub-project, may have been useful for either avoiding funding of this project altogether or for stipulating actions that Oruva should take to improve profitability.

8.8.8.7.6 Co-financing and project outcomes & sustainability

2666. Oruva declared $1,851,296 as co-finance in Phase 1 for the small scale production of HFC-134a and HC-600a compressors. In fact, Phase 1 was 100% financed by Oruva and there was no co-finance for Phase 2 as this was 100% paid by the GEF.

2667. Financing of Phase 1 by Oruva was assessed as contributing toward promoting the sustainability of the conversion of the compressor production line, after the sub-project was concluded. A successful company will usually invest funds only in areas that have the prospects for recovery of investment costs over time, which can only be regained if the operations continue after company funds have been spent on the investment.

2668. The investment by Oruva Phase 1 did not result in sustainability for the company, as other factors resulted in the compressors being uncompetitive in the market and the company becoming insolvent.

8.8.8.7.7 Project implementation delays and impact on project outcomes & sustainability

2669. The first part of the project (from approval to installation of the equipment) was completed in December 2000 without delay. However, after the declaration of bankruptcy by Oruva in 2001, trials were successfully performed and completed by the new owner of Oruva in December 2002. The UNDP/UNOPS sector expert visited the project and ascertained that it was satisfactorily completed in June 2003.

2670. There was therefore a 2.5 year delay from the installation of the equipment to the agreement by UNDP that the project had been completed. Because of fierce market competition in the compressor sector, the World Bank recommended that compressor projects should be… *finished and put into production as early as possible*. This was not the case with Oruva due to the delay, may have been crucial and a significant contributor toward Oruva's bankruptcy and lack of sustainability.

8.8.8.8 Sub-Project Rating

LIT/97/G35 Conversion of the manufacturing facility at Oruva to enable mass production of HFC-134a compressors (UNDP/UNOPS)		
Criterion	**Evaluator's Summary Comments**	**Evaluator's Rating**
Attainment of project objectives and results Sub criteria (in yellow below)	Note that the company was in receivership at the time of the evaluation. The Bankruptcy Administrator was not able to provide detailed information	S

[444] Mr Mahir Aliyev (Associate Portfolio Manager, UNDP), Mr Risto Ojala (UNDP aerosol expert), Ms Cihan Sultanoglu (UNDP resident respresentative), and Mr Darius Kontvainis (UNDP administrative officer)

[445] MLF. 2000. Desk study on compressor projects. UNEP/OzL.Pro/ExCom/31/17. Page 3.

LIT/97/G35 Conversion of the manufacturing facility at Oruva to enable mass production of HFC-134a compressors (UNDP/UNOPS)		
Criterion	**Evaluator's Summary Comments**	**Evaluator's Rating**
Effectiveness	CFC-free technology for compressor production installed; equipment tested; UNDP stated the project was complete	S
Relevance	Conversion to non-ODS technology is consistent with minimising the detrimental effect of ODS on the ozone layer	HS
Efficiency	Cost-effectiveness of the compressor conversion not relevant as to do so would risk double counting of CFCs phased out in refrigerator production; cost of CFC-113 phase out of 20 ODP tonnes not available	S
Sustainability of Project outcomes (overall rating) Sub criteria (in yellow below)	See comments below	S
Financial	Company went bankrupt immediately after installation of the equipment; the new owner could not improve sustainability	U
Socio-Political	There were no socio-political risks affecting the sustainability of the company. The main factor was the company remaining competitive in a very fierce international market	S
Institutional framework and governance	Ban on the import and use of CFCs, and the support of key institutions in Lithuania, indicated a satisfactory institutional framework and governance	S
Environmental	Use of HFC-134 is subject to international and national legislation as this gas is 1300 times more global warming than carbon dioxide; few environmental controls for hydrocarbon	S
Achievement of outputs and activities		S
Monitoring and Evaluation (overall rating) Sub criteria (in yellow below)	See below	
M&E Design	No specific design for monitoring and evaluation	U
M&E Plan Implementation (use for adaptive management)	There was some evidence of adaptive management, as UNDP visited Oruva after it went bankrupt for the first time and worked with the NOU to decide the options for	S

LIT/97/G35 Conversion of the manufacturing facility at Oruva to enable mass production of HFC-134a compressors (UNDP/UNOPS)		
Criterion	**Evaluator's Summary Comments**	**Evaluator's Rating**
	equipment ownership	
Budgeting and Funding for M&E activities	No information available on the budgeting and funding of the monitoring and evaluation activities	U
Catalytic Role	No categorisation required	
Preparation and readiness	The stakeholders and management of SINO were reasonably well prepared	S
Country commitment and motivation*	MoE and Oruva were prepared and ready because the import of CFCs had been banned before the start of the project, and Oruva had already completed small scale production of HFC-134a and HC-600a compressors	HS
Stakeholders' involvement	The project involved the relevant stakeholders and made use of the skills, experience and knowledge of key national and international organisations	S
Financial planning	There was no report on the expenditure versus budget in this sub-project	U
UNEP supervision and support**	UNDP visited when Oruva went bankrupt and suggested activities that the new owner could undertake that would lead to the transfer of ownership from UNDP to Oruva;	S
Overall Rating		S

Highly Satisfactory (HS); Satisfactory (S); Moderately Satisfactory (MS); Moderately Unsatisfactory (MU); Unsatisfactory (U); Highly Unsatisfactory (HU);
*Motivation replaced TOR '*driveness*'; **Support replaced TOR 'backshopping'

8.8.9 Projects on methyl bromide

2671. The GEF initially funded a UNEP Project entitled "*Initiating early phase out of methyl bromide in CEITs through awareness raising, policy development and demonstration/training activities*". This was a Medium-Sized Project (MSP) that was designed to assist seven CEITs to reduce their use of methyl bromide[446]. The Project commenced in March 2000 and concluded in September 2002. The total budget was $806,195 consisting of $700,000 from GEF, $37,000 in kind from the government, and $106,195 from Canada.

2672. The Project "*Initiating early phase out of methyl bromide in CEITs through awareness raising, policy development and demonstration/training activities*" consisted mainly of awareness raising activities on the uses of methyl bromide and its alternatives, policy development for methyl bromide phase out, identification of alternatives, diffusion of demonstration results, adoption of alternatives, and implementation of national programmes.

2673. Workshops were held in Hungary (23-25 April 2001, soil uses) and Bulgaria (28-30 May 2002, postharvest uses). These workshops concluded, *inter alia*, that further investment was needed to implement methyl bromide alternatives for to control pests in soil and durable commodities,

[446] GF/4040-00-10 for CEITs Bulgaria, Estonia, Hungary, Latvia, Lithuania, Poland and Slovakia

and possibly for structural fumigation. The workshops also identified a need for non-investment activity such as training in the implementation of policies and measures to limit the use of methyl bromide and to expand the use of alternatives, to support and sustain training on the use, and the development of, alternative techniques.

2674. The usefulness of this initial project was assessed in a survey to all countries that participated in the project. With the exception of Lithuania, the countries surveyed by UNEP in May 2002 affirmed that the regional workshops had assisted them in the development of training strategies. As a result of the regional workshops, most countries developed awareness raising materials and training materials except Lithuania, who instead formulated a series of regulations[447]. This project did, however, lay the foundation for further work in Lithuania by UNDP/UNEP in a project entitled "*Total Sector Methyl Bromide Phase Out in Countries with Economies in Transition*", which aimed to complete the phase out of Non-QPS uses of methyl bromide in six countries. The results of this Project are assessed in this Evaluation Report.

8.8.10 GF/4040-05-05 "Total Sector Methyl Bromide Phase Out in Countries with Economies in Transition"

8.8.10.1 Introduction

2675. The GEF also funded the UNDP/UNEP "*Total sector methyl bromide phase out in countries with economies in transition*" was designed to assist five[448] CEITs to phase out all uses of methyl bromide except quarantine and pre-shipment by 1 January 2005, in accordance with the text of the Copenhagen Amendment of the Montreal Protocol that was relevant to developed countries.

2676. The UNEP budget for the non-investment activities in the regional project was $4,203,754 including $130,500 for project development, $2,151,325 from the GEF and $1,921,929 of in-kind co-finance[449]. The UNDP budget for the investment activities in the regional project was $3,267,075 including $45,000 for project development, $2,848,675 from the GEF and expected in-kind contributions of $373,400[450]. The total budget for the project was therefore $7,470,829. The regional methyl bromide phase out project was scheduled to commence in May (UNEP) or December (UNDP) 2004 and to conclude in May 2006 (UNEP) or November 2007 (UNDP).

2677. This Regional Project aimed to phase out 6.2 ODP-tonnes per year of methyl bromide used in grain silos and elevators in Lithuania[451]. The Project was approved by the GEF on 1 May 2004, officially started in Lithuania on March 2005[452], and completed in June 2008. The GEF provided $276,829 of financial assistance to Lithuania for phosphine fumigation[453] and Integrated Pest Management[454] (IPM) equipment; and $41,000 for study tours, training on phosphine fumigation, IPM procedures and other alternatives.

2678. Lithuania reported a 10-year average consumption of 10.8 ODP-tonnes of methyl bromide per year from 1994 to 2003. Lithuania did not import for three of those years, which resulted in zero consumption reported for some years to the Ozone Secretariat[455], although methyl bromide was probably still applied. Lithuania did not apply for critical uses exemptions of methyl bromide after 1 January 2005[456].

2679. The consumption of methyl bromide reported by Lithuania for 2001, 2002 and 2003 was 6.0 ODP tonnes in each of these years. The EU reported methyl bromide consumption on behalf of all

---

447 Ausher, R. 2003. Evaluation of the project on initiating the early phase-out of methyl bromide in countries with economies in transition through awareness-raising, policy development and demonstration and training activities. GF/4040-00-10. UNEP Evaluation and Oversight Unit. 42pp. Page 4.

448 GF/4040-05-05 for CEITS Bulgaria, Estonia, Hungary, Latvia, Lithuania and Poland. Azerbaijan and Uzbekistan were observers. Estonia did not consume methyl bromide

449 UNEP. 2008. UNEP GEF PIR FY 2008 Review 1. For the period 1 July 2007 to 30 June 2008. 50 pp

450 UNDP. 2003. Total Sector Methyl Bromide Phase Out in Countries with Economies in Transition. GEF – UNDP Project Doc. 29 pp.

451 MB - PIRMBProject08rev1, page 6. Annex 1 shows costs TBD for the demonstration of methyl bromide alternatives.

452 Activities on the ground started in July 2006

453 Materials and equipment for sealing silos, recirculation system for silos, blowers for aeration, safety equipment, phosphine detectors and measure equipment

454 Industrial vacuum cleaners, insect and rodent monitoring kits (floor traps, pheromone traps); and heat treatment materials such as ThermoNox mobile heating units, electrical distribution system, infrared heat measurement gun, ventilators-blowers

455 Consumption of MB was 15 ODP-tonnes/1996; 0/1997; 9/1998; 0/1999; 0.5/2000; 8.8/2001; and zero from 2002

456 TEAP. 2009. Critical Use Nominations for Methyl Bromide. Annex IV. Part A: Trend in Pre-Plant Soil Applications. Part B: Trends in Post-harvest Structural and Commodity Applications. Period 2005 to 2010. Information supplied by the Ozone Secretariat to MBTOC. Pages 79-83.

Member States including Lithuania from 2004 onwards, but the amount consumed by Lithuania was not publicised. Given the low level of consumption in 2001 to 2003, it is likely that the project funding in Lithuania was most used to sustain the phase out of the non-QPS uses methyl bromide, rather than to phase out methyl bromide.

8.8.10.2 Attainment of objectives and planned results

8.8.10.2.1 Effectiveness

2680. The project that aimed to phase out methyl bromide regionally through a combination of awareness raising activities, policy development assistance, training on alternatives and investment activities, and data collection activities to measure the impact of the project. According to UNEP[457], this included the following performance indicators:

- Provision of methyl bromide publications and materials (with provisions for translation into local languages) to support *awareness-raising* activities;
- Training workshops or modules on *policy development* for the control of methyl bromide (bringing together policy makers, Customs officers, importers, users, producers);
- *Training courses/workshops* to educate stakeholders on alternatives and to develop training strategies for local extension workers on promoting and implementing alternatives;
- *Investment activity* to implement suitable methyl bromide alternatives for control of pests in soil (pre-harvest) and durable commodities (post-harvest); and
- The phase out of non-QPS methyl bromide consumption[458].

2681. The achievement of outputs and activities by Lithuania, as measured against these performance indicators, are provided in Section 8.8.4.5.1 "*Delivered outputs*" on page 451.

8.8.10.2.2 Relevance

8.8.10.2.2.1 Continued reduction of methyl bromide

2682. The five countries that had reported consumption of methyl bromide, and that were participants in the project "*Initiating early phase out of methyl bromide in CEITs through awareness raising, policy development and demonstration/training activities*", were reported to have reduced their combined consumption of methyl bromide from 120.42 ODP-tonnes at the start of the project to 86.16 ODP-tonnes in 2000.

2683. However, consumption reported in 2001 indicated that for some countries investment assistance was urgently needed to fully phase out methyl bromide. Bulgaria, the Czech Republic, Estonia, Hungary, Latvia, Lithuania, Poland, and Slovakia were the original participants in the project. Bulgaria, Hungary, Latvia, Lithuania and Poland were responsible most of the methyl bromide consumption in the region.

2684. In 2001, three countries (Bulgaria, Latvia and Poland) showed signs of increased methyl bromide consumption. The governments of these countries maintained that without further assistance they would be unable to completely phase out methyl bromide. As for Lithuania, this country reported consumption of methyl bromide in 2001, 2002 and 2003 at a time when countries in the regional project had reported zero methyl bromide consumption. Therefore, there was justification for UNEP and UNDP including Lithuania in the project to ensure that methyl bromide was phased out and did not increase again in that country.

8.8.10.2.2.2 Avoidance of methyl bromide critical use requests

2685. Regulation (EC) No 2037/2000 on *Substances that Deplete the Ozone Layer* had more stringent criteria for determining 'critical use' exemptions than criteria contained in the Montreal Protocol[459]. In 2005, the EU licensed only modest critical use exemptions that were much less

[457] UNEP. 2003. GEF PDF Block B Request: *Total Sector MB Phase Out in Countries with Economies in Transition*. Page 9. UNEP-DTIE internal publication. 41 pages.

[458] Included by the evaluators in this report as this was implied but not stated by UNEP.

[459] Regulation (EC) No 2037/2000. Article 3 (2)(iii).

than those approved by the Montreal Protocol, in accordance with the criteria contained in Decision IX/6 of the Montreal Protocol.

2686. The project was relevant as it assisted the countries participating in the project to deploy alternatives as fast as possible in order to avoid the need for 'critical uses' of methyl bromide. The short time frame for the project required the transfer of proven methyl bromide alternatives from other regions with similar climates and conditions, and to adapt them to local conditions.

8.8.10.2.2.3 Compliance with market standards

2687. Farmers in Europe at the time were experiencing market pressures to reduce the environmental impact of their farming practices. European supermarket chains had established a code of practice for agricultural production for fruit and vegetables, called EurepGAP. EurepGAP is a private sector body that sets voluntary standards for the certification of agricultural products globally. These standards were developed in response to consumer concerns about food production standards, pesticides and environmental pollution from agriculture.

2688. Increasingly at that time and even today, the European supermarket chains were requiring farmers/suppliers to comply with these strict standards, if they wished to continue supplying the supermarkets in the future. The standards required suppliers/farmers to justify in writing the use of methyl bromide and other fumigants, and strongly promoted integrated pest management (IPM) and non-chemical methods of controlling pests and diseases.

2689. The project was relevant because it helped to build capacity for the longer-term development of non-chemical alternatives that are suitable for the markets and circumstances in which they operate.

8.8.10.2.2.4 Recommendations for reducing methyl bromide use

2690. The GEF[460] stated that "*…In order to achieve compliance with the Montreal Protocol, a full phase out of all reported (non-QPS) consumption (and production) needs to be achieved by the end of 2004 … consumption needs to be reduced from the current levels … to zero in 2005*". Because methyl bromide was still being consumed in Lithuania in 2001 just prior to when the project was being formulated[461], Lithuania was eligible for assistance to completely phase out methyl bromide.

2691. The Workshop on Methyl Bromide Alternatives for Soil Uses (April 2001, Hungary) concluded in part that the deployment of alternatives *"…may need extra financial investment, (with the further) support of the GEF, particularly where the establishment of soil-less production, registration of new biological agents or pesticides, or higher application costs of physical and cultivation costs are involved".* Although Lithuania focused only on post-harvest uses, the areas where financial investment was needed to solve pest problems in this sector was still relevant.

2692. A similar conclusion was reached by working groups at the subsequent meeting in Bulgaria for training in post-harvest alternatives (May, 2002), where participants concluded in part that *"…Alternatives are present, but assistance is required for technology transfer and adaptation to the specific conditions, and to produce new alternatives as the existing ones are not always suitable to replace methyl bromide (under the conditions experienced in the CEITs of the Eastern European region)…".*

2693. The reduction and phase out of methyl bromide in Lithuania is also consistent with the objectives of the Vienna Convention and the Montreal Protocol, which *requires Parties to take appropriate measures in accordance with the provisions of this Convention and of those Protocols in force to which they are party to protect human health and the environment against adverse effects resulting or likely to result from human activities which modify or are likely to modify the ozone layer*[462].

2694. The GEF established in 1995 an Ozone Layer Depletion Focal Area in response to the Montreal Protocol. The Focal Area has the strategic objective of protecting human health and the

---

[460] GEF. 2003. GEF Support to Countries with Economies in Transition in Phasing Out of Annex C1 and E Substances of the Montreal Protocol GEF/C.18/Inf.6, page A4

[461] Ozone Secretariat Data Centre. 2009. Latvia reported to the Parties of the Montreal Protocol a consumption of 8.8 ODP-tonnes of methyl bromide in 2001.

[462] Handbook for the Vienna Convention for the Protection of the Ozone Layer - 7th Edition (2006). Article 2: General Obligations.

environment by assisting countries to phase out their consumption and production of ODS, to prevent emissions of ODS, and to encourage the uptake of alternative technologies and practices according to a country's commitments under the Montreal Protocol. The financial interventions in the GEF Focal Area contribute to the return of the ozone layer to pre-1980 ozone levels, which is expected by 2065.

2695. The reduction and phase out of methyl bromide was a requirement for developed countries such as Lithuania that had ratified the Copenhagen Amendment in the Montreal Protocol. In addition, the reduction and phase out of methyl bromide was required by 31 December 2004 which was shortly after Lithuania's accession to the EU on 1 May 2004. The sustained phased out of methyl bromide was therefore relevant for avoiding non-compliance with EU legislation on methyl bromide that applied shortly after accession.

2696. The actions taken by Lithuania to phase out methyl bromide were therefore relevant to continuing the reductions in methyl bromide use that had been achieved in previous projects, compliance with market standards by implementing production practices that minimised the use of chemicals in the food chain, recommendations for reducing methyl bromide use, compliance with Montreal Protocol, and sustainability of the compliance with EU regulations after accession to the EU.

8.8.10.2.3 Efficiency

2697. The cost-effectiveness as a means of determining '*efficiency*' was not relevant to the Institutional Strengthening component of this project (such as advice on the development of policies and measures), as Institutional Strengthening is not normally subject to cost-effectiveness criteria. The GEF/UNEP-UNDP non-investment in this regional project was $4,203,754.

2698. Lithuania aimed to phase out 6.2 ODP-tonnes per year of methyl bromide in the postharvest sector. The GEF provided $276,829 of financial assistance to Lithuania for phosphine fumigation[463] and Integrated Pest Management[464] (IPM) equipment; and $41,000 for study tours, training on phosphine fumigation, IPM procedures and other alternatives.

2699. In 2003, which was the last year of methyl bromide consumption data published for Lithuania and about 15 months before the project commenced on March 2005, Lithuania reported a methyl bromide consumption of 6.0 ODP-tonnes[465]. A consumption of 6.2 ODP-tonnes was used by UNEP as the baseline quantity of methyl bromide to be phased out, which was close to the reported consumption. Based on the GEF funding for investment activities of $276,829 the cost-effectiveness of the project for sustaining the phase out of the methyl bromide was therefore $44.65 per ODP-kg.

2700. UNDP estimated the cost-effectiveness to the GEF to be about $50 per ODP-kg for the investment component of the regional project, based on the phase out of about 100.2 ODP-tonnes of methyl bromide annually in the region of the participating countries[466].

2701. The cost-effectiveness reported by the MLF for the phase out of methyl bromide in 31 Developing Countries prior to 2003 ranged from $0.04 to $85.18 per ODP-kg, the price depending mainly on the size of the project and its location[467]. The average cost-effectiveness in 24 completed projects that were assessed by the MLF was $23.55 per ODP-kg of methyl bromide.

2702. The cost-effectiveness of $44.65 per ODP-kg based on the targeted phase out of methyl bromide in Lithuania of 6.2 ODP-tonnes was about 90% more than the average cost-effectiveness of $23.54 ODP-kg per year of MLF-financed methyl bromide phase out projects described above. The cost-effectiveness of the methyl bromide phase out project in Lithuania was therefore assessed as relatively expensive, compared with similar projects undertaken in developing countries. That said, projects in post-harvest sector have higher cost for equipment needed to replace methyl

---

[463] Materials and equipment for sealing silos, recirculation system for silos, blowers for aeration, safety equipment, phosphine detectors and measure equipment

[464] Industrial vacuum cleaners, insect and rodent monitoring kits (floor traps, pheromone traps); and heat treatment materials such as ThermoNox mobile heating units, electrical distribution system, infrared heat measurement gun, ventilators-blowers

[465] Ozone Secretariat Data Centre, 13 May 2009

[466] UNDP. 2003. Total Sector Methyl Bromide Phase Out in Countries with Economies in Transition. GEF – UNDP Project Document. 29 pp. Page 27

[467] MLF. 2004. Desk Study on Methyl Bromide Projects. UNEP/OzL.Pro/ExCom/43/8. Annex V, pages 36-37.

bromide in this sector[468], compared to the pre-harvest sector.

8.8.10.3 Assessment of sustainability of project outcomes

8.8.10.3.1 Financial resources

2703. Lithuania has financed a National Ozone Unit (NOU) since 2002, which was staffed by 3 Full-Time-Equivalents (FTE) until May 2005. Since 2002, the MoE has been the competent authority responsible for coordinating all activities on ozone layer protection in Lithuania.

2704. Several organisations in Lithuania were financed by the government to undertake activities related to the phase out ozone-depleting substances, including methyl bromide:

- Customs Department (import and export of ODS to non-EU countries);
- Labour Education and Training Service (LETS);
- Ministry of Social Labour (MSL); and
- Ministry of Education and Science (MES).

2705. From 2002 until today, the NOU has been led by one person[469]. From April 2005, the NOU has assigned 1.5 FTE by the government of Lithuania to address issues on ODS.

2706. To leverage the effectiveness of the NOU with few staff, the MoE has put in place legislation that empowers other services (such as Customs officers and inspectors) to undertake work on ODS according to the legislative requirements, and to report the results of their activities. The NOU shares concerns and coordinates policy development with other units that work on climate and F-gases in order to harmonize requirements at the national level and to facilitate implementation by industry.

2707. For these reasons, the prospects for continuing finance by the government of Lithuania on activities relating to the reduction and phase out of ozone-depleting substances were assessed as likely, but they are likely to be carried out at a relatively modest level given the poor economic conditions that current prevail in Lithuania due to the global economic crisis.

8.8.10.3.2 Socio-political

2708. The major use of the methyl bromide in Lithuania was for the disinfestation of flour mills and silos. A National Steering Committee was established. It was chaired by the Secretary of the MoE. The National Steering Committee consisted of members from the MoE, the State Plant Protection Service (chemical registration and extension work), the State Grain and Seed Service, the Grain Processors Association, and a fumigation company. The MoE cooperated closely with the Ministry of Agriculture (for the registration of chemicals), the Ministry of Health (for fumigator certification) and the Ministry of Labour (for safety requirements). The State Plant Protection Service has a general mandate for maintaining national plant health and plays major role in the agrochemical registration process, education, training and supervision.

2709. The government of Lithuania has put in place the structure that was able to be responsive to the work on ozone layer protection. The government has implemented a multi-stakeholder approach that involves different services, administrations and ministries to undertake activities on monitoring and reporting ODS use. The requirements of the stakeholders are supported by legislation. In this way, the NOU itself can remain relative small with a strategic role, knowing that other stakeholders are involved in ozone layer protection.

8.8.10.3.3 Institutional framework and governance

2710. The institutional framework in Lithuania for this project consisted of the Ministry of Environment (and the NOU), the State Plant Protection Service that was responsible for chemical registration and extension work; the State Grain and Seed Service and the Grain Processors Association. The MoE cooperated closely with the Ministry of Agriculture that was responsible for the registration

[468] UNDP. 2003. Total Sector Methyl Bromide Phase Out in Countries with Economies in Transition. GEF – UNDP Project Document. 29 pp. Page 27

[469] Head of Chemical Substances, Division of Environmental Quality, MoE. Also responsible for Strategic Approach to International Chemicals Management.

of chemicals; the Ministry of Health that was responsible for fumigator certification; and the Ministry of Labour that was responsible for safety requirements. The State Plant Protection Service has a general mandate for maintaining national plant health and played a major role in the agrochemical registration process, education, training and supervision.

2711. The MoE met with representatives of the Grain Processors Association, as part of the awareness campaign on alternatives to methyl bromide for grain. Companies that were using phosphine were also informed of the aims of the Regional Project. The State Plant Protection Service was informed of the need to protect the ozone layer and the regulatory requirements for alternatives. The State Environmental Health Centre and Ministry of Health were informed of the need for alternatives to methyl bromide. Information on alternatives in the EU was posted on the MoE website.

2712. A training programme was delivered by a training company contracted to UNEP, and workshops were held (see Section 8.8.10.5.1.3: *Training and workshops* on page 506).

2713. In 1994, Lithuania introduced a permitting system for the import of ozone-depleting substances. In 1996, Lithuania's Action Plan[470] included an environmental protection goal to reduce ODS by introducing legislation from 1996 to 1998 that would control ODS import, export and use including methyl bromide. Legislation in 1999 introduced the requirement for a license to store ozone-depleting substances; import quotas for ozone-depleting substances; a ban on the use of CFCs for use in new refrigeration and air-conditioning equipment, in aerosols and in the production of foam; and further restrictions on the use of methyl bromide. In 2003, Lithuania introduced a ban on new uses of ozone-depleting substances. Regional environmental protection departments were responsible for implementing and enforcing the legislation, by permits for use and inspections of companies. Environmental taxes or subsidies were not introduced as import quotas became the most efficient legislative instrument for controlling ozone-depleting substances that were imported by only 3 importers.

2714. The 2004 legislation harmonised as much as possible Lithuanian legislation on ODS with Regulation (EC) No 2037/2000 at the time Lithuania joined the EU on 1 May 2004[471]. A separate regulation on fluorinated gases came into force in 2006 in Lithuania[472]. The NOU is not responsible for work on F-gases, but cooperates with the personnel that are involved in F-gases.

2715. The range of government organisations involved in Lithuania, and the legislation that was in place, was assessed as sufficient to promote the sustainability of the methyl bromide phase out because these government organisations were staffed by personnel that had built up experience in activities related to the reduction and phase out of methyl bromide, including training in best-practice management of alternatives to methyl bromide. The legislation was considered important for sustaining the phase out, which is discussed further in Section 8.8.10.3.4.

8.8.10.3.4 Environmental

2716. The main driver affecting the use of methyl bromide in Lithuania was national and EU legislation that existed at the time of the project that restricted the use of methyl bromide and that required activities by users and Member State competent authorities. The EU legislation has since been superseded by revised legislation that has eliminated the use of methyl bromide altogether.

2717. The environmental legislation that was in force in the EU at the time of the project and until 31 December 2009, and relevant for postharvest uses, was Regulation (EC) 2037/2000. This legislation required Member States:

- To phase out the placing on the market of non-QPS uses of methyl bromide by 31 December 2004;
- To put in place all precautionary measures practicable to prevent and minimise leakages of methyl bromide from fumigation installations and operations in which methyl bromide is used;

[470] Decree No I-1550. 25 September 1996. Lithuanian Republic Parliament

[471] LAND 50-2004: Ozone-Depleting Substances Management Requirements. In force from 1 May 2004. It implemented Regulation (EC) No 2037/2000 from the date that Lithuania joined the EC.

[472] This regulation transposed into national legislation Regulation (EC) No 842/2006 on F-gases.

- To define the minimum qualification requirements for the personnel involved in methyl bromide fumigation;
- To require producers, importers and exporters of methyl bromide to report to the European Commission on the quantities of ODS produced, imported and exported annually; and
- To submit annual reports on the use of methyl bromide and its alternatives, critical uses of halons, the use of CFCs in medical products that control asthma, the phase out of halon on ships and in aircraft, and the quantity of ozone-depleting substances recovered, reclaimed, recycled and destroyed.

2718. The 2004 legislation in Lithuania harmonised as much as possible Lithuanian legislation on ODS with Regulation (EC) No 2037/2000 immediately prior to Lithuania joining the EU on 1 May 2004[473]. This national regulation, that limited the availability of ozone-depleting substances including methyl bromide, also had the secondary important effect of encouraging the development of ODS-free alternatives as a way of controlling pests without the restrictions inherent in the ozone-depleting substances.

2719. New legislation on ODS came into force on 1 January 2010. Regulation (EC) No 1005/2009 replaced Regulation (EC) 2037/2000. Methyl bromide did not meet the safety criteria and was de-registered in the Biocides Directive[474] (non-plant pesticide) from 1 September 2006, and in the Pesticides Directive[475] (Plant Protection Product, PPPD) from 18 March 2009.

2720. Regulation (EC) No 1005/2009 allows MB-QPS stocks[476] to be used until 18 March 2010, but limits the quantity to 45 ODP-tonnes from 1 January to 18 March 2010, and none from this date onwards. Up until 18 March, methyl bromide can only be used for QPS at government-approved fumigation sites and only if degassing equipment is in place to recover 80% of the methyl bromide used in the fumigation. Methyl bromide may be used for Emergency Uses[477] for controlling unexpected pest outbreaks, but only if it is first authorised by the European Commission and providing methyl bromide is permitted under the Biocides and Pesticides Directives. Currently, methyl bromide is not permitted in these Directives and *ipso facto* it cannot be used for QPS. Therefore, all uses of methyl bromide including those for QPS are banned in the EU including Lithuania from 19 March 2010. A total ban of methyl bromide will prevent QPS uses being used off-target for non-QPS uses.

2721. The main environmental risk that could undermine the implementation of the alternatives in Lithuania is illegal imports of methyl bromide. However, this seems unlikely since no illegal imports of ozone-depleting substances have been intercepted in the past three years. On one occasion in 2006, the Customs identified potential illegal imports of CFCs from the Republic of Korea, but it transpired that they were in transit to Russia. On an earlier occasion in 2005, illegal transfer of ODS to ships was suspected, but with further investigation it transpired that the company involved had applied an incorrect customs code. The MoE and Customs work closely together on legislation. MoE provides Customs with the latest decisions adopted under the Montreal Protocol on curtailing illegal trade, and any guidance documents that have been developed. The Customs codes were revised recently to facilitate cross-checking of imports.

2722. In addition to the inspection and monitoring procedures that have been implemented for ozone-depleting substances including methyl bromide, the previous and current regulation on ozone-depleting substances has in place a requirement for Member States to put in place *effective, proportionate and dissuasive* penalties for illegal import of ozone-depleting substances or illegal use of ozone-depleting substances.

2723. The risk of methyl bromide import and use re-establishing in Lithuania was assessed as low, because of the national and EU legislation, as well as Custom's ODS surveillance procedures and reporting that were in place to detect and confiscate any imports of methyl bromide which would be illegal.

---

[473] LAND 50-2004: Ozone-Depleting Substances Management Requirements. In force from 1 May 2004. It implemented Regulation (EC) No 2037/2000 from the date that Lithuania joined the EC.
[474] Regulation (EC) 2032/2003
[475] Decision 2008/753/EC
[476] Articles 12 (1) (2) in Regulation (EC) No 1005/2009 on ODS
[477] Articles 12 (3) in Regulation (EC) No 1005/2009 on ODS

8.8.10.4 Catalytic role

2724. The key factors influencing catalytic action are *innovation, demonstration, replication* and *co-operation*. In this methyl bromide sub-project, the two factors that influenced catalytic action were *replication* and *co-operation*.

2725. The Project Coordination Unit that was established in Lithuania to assist with the coordination of the activities on alternatives to methyl bromide, was responsible for encouraging a '*bottom to top*' training process. This increased the capacity of stakeholders to sustain the phase out and to take operational decisions that were both effective and economically viable. The planned activities and the use of cooperative methods of delivery laid the foundation for a supportive framework that implemented the alternative technologies.

2726. As a result of the project, UNEP organised the participation of experts from the World Bank and the MLF to promote the *replication* of the training activities developed in this regional project. The training manuals were translated (into Russian), for broader use in the Eastern Europe and Central Asian region, at the cost of the MLF funds of the ECA network.

2727. The World Bank officer responsible for the Ukraine methyl bromide project, as well as the Regional Ozone Network for Europe and Central Asia, were kept informed of the results of this regional project because of its potential to help with the phase out of methyl bromide in other countries through *replication* of all or part of the work that was carried out in the regional project.

2728. For these reasons, this methyl bromide regional phase out project was assessed as having a useful catalytic role.

8.8.10.5 Achievement of outputs and activities

8.8.10.5.1 Delivered outputs

2729. Paragraph 2680 above showed the basis for selecting the following achievement or performance indicators:

- Provision of methyl bromide publications and materials (with provisions for translation into local languages) to support *awareness-raising* activities;
- Training workshops or modules on *policy development* for the control of methyl bromide (bringing together policy makers, Customs officers, importers, users, producers)
- *Training courses/workshops* to educate stakeholders on alternatives and to develop training strategies for local extension workers on promoting and implementing alternatives;
- *Investment activity* to implement suitable methyl bromide alternatives for control of pests in soil (pre-harvest) and durable commodities (post-harvest); and
- The phase out of non-QPS methyl bromide consumption.

2730. The delivered outputs are discussed for each of them below.

8.8.10.5.1.1 Awareness raising

2731. The GEF/UNEP Project[478] "*Initiating early phase out of methyl bromide in CEITs through awareness raising, policy development and demonstration/training activities*" assisted Lithuania to sustain its phase out of methyl bromide.

2732. The project consisted mainly of awareness raising activities on the uses of methyl bromide and its alternatives, policy development for methyl bromide phase out, identification of alternatives, diffusion of demonstration results, adoption of alternatives, and implementation of national programmes. Workshops were held in Poland (25–27 October 2000, regional policy development workshop), Hungary (23-25 April 2001, soil uses) and Bulgaria (28-30 May 2002, postharvest uses)[479]. This specific awareness raising work on methyl bromide was part of a broader awareness raising programme in Lithuania on the need to phase out ozone-depleting

[478] GF/4040-00-10. Prof Reuben Ausher Review reported in October 2003.
[479] Ausher, R. 2003. Evaluation of the Project GF/4040-00-10 on the early phase out of methyl bromide in CEITs.

substances generally.

2733. Training courses were held on alternatives to methyl bromide which helped to raise the awareness of alternatives to methyl bromide. These are described in Section 8.8.10.5.1.3: *Training and workshops* on page 506.

2734. The awareness raising activities on methyl bromide alternatives were part of a larger programme on awareness raising on ozone-depleting substances in general that was undertaken by the NOU in Lithuania from 2002 to 2005. That programme targeted a diverse audience including the general public, school children, government departments, the fire service and companies involved in ODS. The Awareness Raising activities included: Flood-lit posters for more than a year in the major cities; seminars to halon alternatives companies, ODS importers, distributors and users; booklets on the ozone layer for school children; information on alternatives posted on the website of the MoE; and, in cooperation with the National Refrigeration Association, a series of seminars delivered to companies on ODS. The Awareness campaign evolved out of the Project formulation process during which the major uses of ODS were defined, and the alternatives that could replace them. Gaps in knowledge were identified, and priorities were set for putting in place solutions over a 5 year period.

2735. The NOU reported that the awareness campaign was essential for making companies aware of their legal obligations, and government departments and inspectors aware of their enforcement implications. The NOU reported that the GEF funding was essential for carrying out training on the detection of ODS and, importantly, the alternatives that would reduce the use of ODS. Once people were made aware of the problem, they were able to focus on the challenges of eliminating the use of ODS. The awareness programme was essential for creating a change in attitude at all levels of society in Lithuania.

2736. Awareness raising activities in this project on alternatives to methyl bromide in Lithuania were assessed as having been delivered.

8.8.10.5.1.2 Policy development

2737. Lithuania harmonised its national legislation in 2004 with the legislation of the EU on ozone-depleting substances, which was about two years in advance of its accession to the EU on 1 May 2004. In addition, dissuasive penalties were implemented for violators of the legislation on ozone-depleting substances.

2738. The Lithuanian government has implemented legislation that mandates various government services, administrations and ministries to undertake activities on monitoring and reporting ODS use. The requirements of the stakeholders are supported by legislation. In this way, the NOU itself can remain relative small with a strategic role, on the basis that other stakeholders also contribute to activities on ozone layer protection.

2739. The development of the policies and the implementation of the legislation in Lithuania, were assessed as having been delivered.

8.8.10.5.1.3 Training and workshops

8.8.10.5.1.3.1 Customs training

2740. Five Customs officers were trained on the different types of ODS and equipment packaging and hazardous chemicals, who then transferred the information they received in the training to other officers. Training for Customs Officers was financed with funds from an earlier project that had an Institutional Strengthening component.

2741. Customs focused on the validity of the labelling of imports, any documentation and accompanying certificates, conformity with the chemical inventory system ECICS, and containers importing ozone-depleting substances. The MoE and Customs also work closely together as, for example, the MoE provides Customs with the latest decisions adopted under the Montreal Protocol on curtailing illegal trade, and any guidance documents that have been developed.

2742. Customs was also informed by the NOU of possible illegal imports of CFC-12 and smuggling cases, with examples of the most likely violations. Customs check points were informed of possible illegal imports of CFC-12. The Customs codes were revised to facilitate cross-checking of imports.

2743. There have been no illegal imports of ODS from 2006 to 2009. On one occasion in 2006, the Customs identified potential illegal imports of CFCs from the Republic of Korea, but it transpired that they were in transit to Russia. On an earlier occasion in 2005, illegal transfer of ODS to ships was suspected, but with further investigation it transpired that the company involved had applied an incorrect customs code.

2744. The Customs training and procedures that have been put in place were assessed as satisfactory for reducing the risk of illegal trade in ozone-depleting substances including methyl bromide.

8.8.10.5.1.3.2 Training on alternatives to methyl bromide

2745. At that time of the project, JSC Grudu Pirkliai Ltd was the largest and only fumigation company that used methyl bromide to control pests in silos and grain elevators. The company employed 6 qualified fumigators, and used about 11 tonnes of methyl bromide per year. Two other fumigation companies that operated in Lithuania already used phosphine.

2746. A training programme was delivered by BM Seminar under contract to UNEP. The company provided theoretical and practical information to 28 participants. Ten of them became trainers and trained a further 10 participants. Training materials on alternatives to methyl bromide for grain were translated into Lithuanian and posted on the MoE website.

2747. There were a number of other initiatives that increased the stakeholder understanding of alternatives to methyl bromide. A workshop for 22 participants was held on 18-22 September 2006, which demonstrated the use of heat for disinfestation of pests, and advanced phosphine fumigation technology. The industry organised a training session on the use of the speedbox technology for 17 participants on 14-15 June 2007 at the Jonavos Grudai company. Two participants visited Poland to see firsthand the high pressure CO_2 equipment that had been installed for disinfesting imported herbs and mushrooms. Five participants attended a postharvest regional seminar on non-chemical methods in Poland. The MoE also attended a meeting with the European Commission to determine the prospects for research on non-chemical, sustainable methods of pest control. The NOU visited the Netherlands as part of a study tour organised by UNEP to see the commercial application of controlled atmospheres at ECO_2 Ltd for controlling pests in grain and other commodities.

2748. The training programme and workshops on alternatives to methyl bromide in Lithuania were assessed as having been delivered.

8.8.10.5.1.4 Investment activity

2749. Grūdų pirkliai UAB was the main company involved in Lithuania that was eligible for equipment in this project. This company was the largest and only fumigation company that used methyl bromide in Lithuania to control pests in silos and grain elevators. The company employed six qualified fumigators, and was reported to use about 11 tonnes of methyl bromide per year. Two other fumigation companies that operated in Lithuania already used phosphine.

2750. The equipment that was procured by UNDP was delivered to Grūdų pirkliai in December 2008. Phosphine from speedboxes was registered in Lithuania in 2008, based on an application from the manufacturer, which allowed the speedboxes to be used in Lithuania. This was unusual because in many of the countries involved in the regional project and elsewhere in Europe the company that manufactured the speedbox had experienced difficulty in meeting the data requirements of the local pesticide registration authority for registration.

2751. Apart from chemical treatments, Lithuania also has access to non-chemical treatments for pest control. Mills have been heat-treated in Lithuania using equipment provided by the Project to both Lithuania and Latvia. The owners of the equipment in both countries have agreed to share the equipment as the number of heat-generating machines supplied to each country alone was not capable of generating sufficient heat in the mill to disinfest the pests. The equipment to implement the IPM procedures, such as the vacuum cleaners and pheromone traps provided by the Project, were installed in a flour mill in Lithuania. The equipment for the IPM procedures was also transferred to Grūdų pirkliai.

2752. The investment activity that addressed alternatives to methyl bromide in Lithuania was assessed as having been delivered.

8.8.10.5.1.5 The phase-out of methyl bromide consumption

2753. Lithuania phased out the consumption of methyl bromide from 1 January 2005[480]. There were no requests to the Parties on behalf of Lithuania by the EC for the critical uses of methyl bromide.

2754. The prospects for a sustained phase out of methyl bromide was improved through the provision of phosphine fumigation equipment in this regional project, and by supplementing Lithuania's knowledge on the use of phosphine and IPM / non-chemical methods of pest control. Lithuania's ability to engage at a regional level on ways to assess, manage and ultimately to reduce ODS was enhanced by the Project.

2755. This Regional Project strengthened Lithuania's stakeholder understanding of environmental legislation, as well as promoting greater ministerial and institutional cooperation. It provided a springboard for the Grain Processors Association to explore more environmentally-friendly techniques, which may eventually lead to a non-chemical treatment.

2756. Lithuania continues to use phosphine for pest control in flour mills and grain elevators, more than 3-years after methyl bromide ceased to be used for these purposes. The sustained phase out of methyl bromide since 2005 has maintained Lithuania's compliance with the Montreal Protocol and with EC legislation on ozone-depleting substances. Therefore, the objective of the Regional Project to phase out methyl bromide in Lithuania was assessed as achieved and delivered.

8.8.10.5.2 Awareness about ODS, ODS substitute technology, and strengthening of institutional capacities to achieve the ODS phase-out

2757. The extensive work in Latvia to increase the awareness of ozone layer depletion was described in Section 8.8.10.5.1.1 *Awareness raising* on page 505. The work on methyl bromide substitute technology, which focused on one enterprise that implemented phosphine as a replacement for methyl bromide for pest control, was described in Section 8.8.10.5.1.4 *Investment activity* above.

2758. The NOU was non-existent until it was established in 2002. Since that time, the NOU's capacity has been strengthened by several GEF-funded projects. The first was a GEF/World Bank Project that targeted all ODS for phase out except methyl bromide and HCFCs. The second was a small Project that aimed to reduce the use of methyl bromide, which was a followed by this third and altogether larger Project on methyl bromide which aimed to phase it out.

2759. The NOU successfully coordinated the work of several government organisations and a private training contractor to deliver information on a range of suitable alternatives to the stakeholders. Phosphine was used as the alternative to methyl bromide for pest control, and to some extent heat treatments. The combination of training workshops and practical activities in Lithuania using both government and commercial sources of information expedited the uptake of the alternatives by mill owners and the subsequent elimination of the use of methyl bromide.

8.8.10.5.3 Authority / credibility, necessary to influence policy and decision-makers

2760. The NOU in Lithuania had the authority / credibility, necessary to influence policy and decision-makers, which was shown mainly through the NOUs actions and ability:

- To provide methyl bromide publications and materials to support *awareness-raising* activities;
- To implement *policies and measures* to control of methyl bromide, bringing together policy makers, Customs officers, importers, users, producers;
- To coordinate *training courses/workshops* to educate stakeholders on alternatives and to develop training strategies for local extension workers on promoting and implementing alternatives;
- To encourage *investment activity* to implement suitable methyl bromide alternatives for control of pests in soil (pre-harvest) and durable commodities (post-harvest); and
- The phase out of non-QPS methyl bromide consumption.

[480] UNEP Ozone Secretariat Data Centre. 22 April 2009. Lithuania's consumption of methyl bromide for non-QPS uses was 6 ODP-tonnes in 2001, 2002 and 2003; and not reported from 1 January 2004 as the EC reported as a region.

2761. This credibility has been established by an NOU within the MoE that cooperated with a diverse range of government bodies in Lithuania that were involved in the reduction and phase out of ozone-depleting substances (Section 8.8.10.3.2 *Socio-political* on page 502 described these bodies). The NOU was assessed as capable of carrying out tasks on methyl bromide reduction and phase out due to a combination of political, technical and administrative expertise.

8.8.10.6 Assessment of monitoring and evaluation systems

8.8.10.6.1 Monitoring and evaluation design

8.8.10.6.1.1 UNDP

2762. UNDP took responsibility for the monitoring and evaluation of the investment component. At the end of each project year, the UNDP Montreal Protocol Unit aimed to evaluate the degree to which the objectives of the investment project had been achieved. Supervision missions were planned to be undertaken by relevant experts appointed by UNDP as necessary. The UNDP monitoring and evaluation activities were to be in addition to the normal monitoring and evaluation activity in the project undertaken as standard UNDP procedures.

In the participating countries, independent bodies were identified to also be responsible for M&E activities, as it was considered important to reduce the implementation period to meet the phase out deadlines. The M&E body was designed to act as a continuous management tool, visiting MB users, identifying success and failure factors, and providing information to the Project Coordination Unit and particularly feedback to the Steering Committee and Technical Committee, consultants and Implementing Agencies. The implementation, coordination and monitoring arrangements for the UNEP/UNDP/GEF Project[481] were shown in Figure 20 on page 224.

8.8.10.6.1.2 UNEP

2763. UNEP designed an annual monitoring and evaluation format to assess the non-investment activities, and also provided a Final Assessment design which aimed to report on the results of the project.

8.8.10.6.1.3 Annual evaluation by UNEP

2764. UNEP completed a '*Project Performance and Risk*' Table annually that measured and rated progress toward achieving the project objectives and assessed implementation progress. The progress was reported for each of the countries individually.

2765. The attainment of the project objective, which was '*preservation of the ozone layer*', was measured against the outcome of a '*Sectoral phase out of methyl bromide in countries as required by the schedule of the Montreal Protocol*'. This outcome was defined as uses that were non-QPS and non-CUE, as both QPS and CUEs were permitted under certain conditions.

2766. UNEP's M&E design[482], which aimed to annually measure implementation progress, referenced the requirement to monitor '*outputs*' (Table 51, column 2). UNEP also reported on progress with the implementation of the investment activity that was under the responsibility of UNDP.

Table 51: UNEP-designed "outputs" and "indicators" that were used to monitor progress and evaluate success in the methyl bromide phase out project implemented in Bulgaria

NO	OUTPUT	INDICATOR
Column 1	**Column 2**	**Column 3**
Document	*Project Performance and Risk Final Evaluation*	*Final Evaluation*
1	Development and implementation of cost-effective, sustainable, national phase out coordination structures and mechanisms to	Permanent National Steering Committee, Technical Group, and trained extension service and user

[481] From: UNDP. 2003. Total Sector Methyl Bromide Phase Out in Countries with Economies in Transition. GEF – UNDP Project Document. 29 pp. Page 25.

[482] UNEP. 2008. GEF PIE FY 2008 (for the period 1 July 2007 to 30 June 2008).

NO	OUTPUT	INDICATOR
Column 1	**Column 2**	**Column 3**
Document	*Project Performance and Risk Final Evaluation*	*Final Evaluation*
	carry out the project work, cope with future methyl bromide phase out problem areas, and sustain phase out post-project	groups in countries at project end; registration of additional pest control products where needed; implementation of additional policy measures where needed.
2	Rapid transfer of replacement technologies to MB users, including installation of equipment and participatory training at local level, focusing on a quick replacement for the 2005 growing season to permit country compliance with the Montreal Protocol, [focus on non-chemical and IPM MB alternatives from 2006 onwards][483] [using fumigants/chemicals as necessary][484]	Replacement of MB use in sectors by chemical and non-chemical alternatives at the end of the project
3	Enhanced awareness and confidence of MB users and other stakeholders in the phase out process, through the monitoring of the efficacy and economic performance of alternatives, and increased ability of users to manage pest control problems and find solutions	Detailed regular reports by the Project Coordination Unit and the National M&E Unit on the progress of the MB replacement amongst MB users across sector and sub-sectors. Survey reports of the national M&E Unites, will include investigations into the mindset of the MB users towards the project and phase out exercise
4	Capacity building for the development of more environmentally friendly MB alternatives (primarily based on non-chemical methods), reducing dependency on fumigants/chemical alternatives to ensure sustainability in the long term	Reports by the Project Coordination Unit and the National M&E Unit on the progress of non-chemical and IPM MB alternatives amongst MB users across sector and sub sectors

2767. UNEP also completed annually a '*Risk Factor*' Form, which was a combination of text and check boxes. The Project Manager and the Task Manager assigned ratings to the perceived risk as either '*low, medium, substantial, high, not applicable or to be determined*' for a range of project criteria: Project Management (Management structure, governance structure, internal communications, work flow, co-finance, budget, financial management, reporting, stakeholder involvement, external communications, short/long term balance, science and technological issues, political influences, other); and Project Context (political stability, environmental conditions, social/cultural/economic factors, capacity issues, other).

2768. UNEP also completed a '*Rating Monitoring and Evaluation*' Form, including the M&E activities that were carried out during the reporting period. The mainly text answers in this section covered a broad range of issues, such as the quality of the initial baseline methyl bromide consumption, the usefulness of the indicators that were used to assess performance, any challenges faced by UNEP to obtain data that were required to assess the indicators, and lessons learnt in regard to M&E.

8.8.10.6.1.4 Final Evaluation

2769. UNEP's M&E design[485], which aimed to measure the overall success of the project, referenced the requirement to monitor '*outputs*' (Table 51, column 2) and '*indicators'* (Table 51, column 3).

[483] Text in UNEP "Annual Evaluation" but not "Final Evaluation"
[484] Text in UNEP "Final Evaluation" but not "Annual Evaluation"
[485] UNEP. 2008. Project Final Report – Bulgaria. 8 pp.

The '*indicators'* were used by UNEP only for the Final Evaluation and they were not used in the Annual Evaluation. UNEP also reported on the overall success of the investment activity that was under the responsibility of UNDP.

8.8.10.6.1.5 Evaluation comments on M&E design

2770. The following comments address the ability of the M&E design to track and monitor progress toward achieving the project's objectives:

- The annual implementation progress was not measured against the performance indicator, and it was difficult to see how progress was therefore determined;
- The output often contained more than one element (e.g., cost-effectiveness, coordination, structures/mechanisms, future problem areas), but the response by UNEP addressed some of them;
- Some elements were used in the as an output, but a performance indicator was not developed to measure the output e.g. cost-effectiveness[486];
- '*Problems in delivering outputs'* was a column on the Form that was rarely if ever completed by UNEP, which suggested that the projects had no difficulties achieving the outputs required;
- '*Expected completion date'* was a column on the Form that was rarely if ever completed by UNEP, which showed that SMART indicators were not used;
- The column format resulted in very long reports because for most of the form only about one-quarter of the page could be used, which made reading the form difficult;
- One Risk Factor table was completed for all five countries involved in the project, whereas in reality the risks were not uniform for all countries;
- The methyl bromide baseline for the project did not take account of the latest consumption data reported to the Ozone Secretariat at the time of the initiation of the project, which resulted in greater expenditure than needed to eliminate less methyl bromide than originally determined by the baseline;
- The evaluation of the M&E undertaken during the project was helpful as it assessed the status and quality of the M&E procedures; and
- The indicators used in the Final Evaluation should have been used to measure performance in the Annual Evaluation.

2771. These limitations in the M&E design were assessed as reducing the ability of UNEP to assess the progress in the implementation of the project that aimed to introduce alternatives to methyl bromide in Lithuania.

2772. UNDP's Monitoring and Evaluation Plans were contained in Annex 5A: *Monitoring, Progress Reporting and Evaluation* and Annex 5B: *Terms of Reference for the Regional/International Project Steering Committee.* These Annexes were omitted from the UNDP Project Document and could not be evaluated.

8.8.10.6.2 Monitoring and evaluation plan implementation

2773. The M&E plans (Annual M&E and Final M&E) were implemented by UNEP, as evidenced by the reports provided to the evaluators. There were no reports that were made available to the evaluators from UNDP.

2774. Although the design of the M&E plan had limitations, its value lay in the 'follow-up' by UNEP that clearly signalled to participants that their progress in this project was being monitored and evaluated. In addition, UNEP required reporting from participants on progress, which was then used to in these annual reports, and workshops were held to share information and keep the project on track.

[486] The cost-effectiveness of alternatives to methyl bromide is very difficult to measure as it depends on the timing of the market, the methods used by the farmer, the level of pest infection at the time, and many other factors. At no stage was the financial value addressed, suggesting that cost-effectiveness was addressed superficially.

8.8.10.6.3 Budgeting and Funding for monitoring and evaluation activities

2775. UNEP budgeted $10,000 for the "…*risk evaluation and development of the monitoring and evaluation strategy…*", and $5,000 for the "… *Evaluation Report (including survey results, needs (technical, financial, policy, training), awareness strategy, identification of co-funding partners, preliminary risk evaluation results…*". These direct costs associated with M&E activities may have also been supplemented by UNEP's activities in general, in their role as Project Coordinator/Consultant. UNDP also was assigned a budget of $45,000 for travel and national consultants, but funds for M&E were not separately identified.

2776. The funding for M&E represents 6.7% ($15,000 of $225,000) of the total budget which, for an important activity, appeared to be relatively small. There was no information on budget versus expenditure and therefore it was not possible to assess the timing of the funding and compliance of expenditure with the budget assigned.

2777. The budget assigned by UNDP for M&E activities was provided in the Annex to the Project Document, but this was omitted from the document that was made available for assessment.

8.8.10.6.4 Long-term monitoring

2778. There was no requirement for long term monitoring in this project. However, Lithuania as a Member State of the EU has national reporting obligations under EU legislation on methyl bromide that it is imported or produced for feedstock and process agent uses[487]. Other uses of methyl bromide are no longer permitted under EU legislation after 18 March 2010, and therefore there are no other reporting requirements related to methyl bromide.

2779. Article 7 "*Reporting of data*" in the Montreal Protocol requires Parties to report by 30 September each year on their consumption and production of ODS in the previous year. Lithuania reported 2003 consumption data to the Montreal Protocol, but consumption data for 2004 onwards was reported by the European Commission on behalf of the EC, including Lithuania as a new Member State.

2780. In addition, Decision XV/15 that was agreed in 2003 encouraged Parties to forward data on consumption and production to the Secretariat as soon as the figures became available, and preferably by 30 June each year, rather than 30 September in order to facilitate the work of the Protocol's Implementation Committee. The Implementation Committee has not remarked on any aspects of data reporting by Lithuania, which suggested that reporting had been timely and accurate. The Ozone Secretariat reported in 2009 that most Parties complied with the voluntary June deadline.

2781. Data reporting by the EU to the Montreal Protocol on methyl bromide consumption is the most important action on long-term monitoring. Zero consumption reported by Lithuania to the EU would result in zero consumption being reported by the EU to the Montreal Protocol. An EU report of zero consumption would indicate that methyl bromide has been phased out in the EU including Lithuania, and continual reporting of zero consumption annually by the EU would indicated that the phase out has been sustained.

2782. Data reporting, and the infrastructure necessary for this, is expected to continue for ozone-depleting substances in general and for specific methyl bromide uses as described above. The costs for these data reports are expected to be included in the annual budget by the government of Lithuania for work assigned to the NOU.

8.8.10.7 Assessment of processes that affected attainment of project results

8.8.10.7.1 Preparation and readiness

2783. The main activity that indicates preparation and readiness for a project is the legislation that was in place in Lithuania prior to the start of the project to control methyl bromide, and the government and commercial infrastructure necessary to implement alternatives to methyl bromide that was in place in Latvia prior to the start of the project.

2784. In 1994, Lithuania introduced a permitting system for the import of ozone-depleting substances which was 11 years before the start of this project in March 2005. In 1996, Lithuania's Action

[487] Article 27 of Regulation (EC) No 1005/2009 on Substances that Deplete the Ozone Layer that came into force on 1 January 2010

Plan[488] included an environmental protection goal to reduce ozone-depleting substances by introducing legislation from 1996 to 1998 that would control ODS import, export and use including methyl bromide. Legislation in 1999 introduced the requirement for a license to store ozone-depleting substances; import quotas for ozone-depleting substances; a ban on the use of CFCs for use in new refrigeration and air-conditioning equipment, in aerosols and in the production of foam; and further restrictions on the use of methyl bromide. In 2003, Lithuania introduced a ban on new uses of ozone-depleting substances. In 2004 Lithuania introduced legislation that harmonised Lithuanian legislation on ozone-depleting substances with Regulation (EC) No 2037/2000 at the time Lithuania joined the EU on 1 May 2004[489]. Therefore, based on legislation that was introduced and in force well before the start of the project, Lithuania was assessed as well-prepared and ready for this project.

2785. The earlier project entitled "*Initiating early phase out of methyl bromide in CEITs through awareness raising, policy development and demonstration/training activities*" had helped to set up the infrastructure that was needed to implement the current project. That project had been instrumental in establishing a team in Lithuania that consisted of specialists on alternatives to methyl bromide, trainers to deliver workshops on alternatives, government ministries that were monitoring and reporting on the use of methyl bromide, awareness raising activities, and policy development. Commercial companies were involved in the workshops. Lithuania's use of methyl bromide was small – on average 10.8 ODP-tonnes of methyl bromide per year from 1994 to 2003 – but nevertheless needed to be replaced by an alternative.

2786. Lithuania was assessed as prepared and ready for this project, mainly because of two previous projects on ozone-depleting substances, and due to legislation that had been put in place to control methyl bromide. The government and commercial infrastructure necessary to implement alternatives to methyl bromide were also in place well before the start of the project.

8.8.10.7.2 Country commitment and motivation

2787. The country commitment and motivation can be determined by the government commitment to funding of activities on ozone layer protection. Lithuania has financed a National Ozone Unit (NOU) since 2002, which was staffed by 3 Full-Time-Equivalents until May 2005. Since 2002, the MoE has been the competent authority responsible for coordinating all activities on ozone layer protection in Lithuania. From 2002 until today, the NOU has been led by one person[490]. From April 2005, the NOU has assigned 1.5 FTE by the government of Lithuania to address issues on ODS.

2788. Several organisations in Lithuania were also financed by the government to undertake activities related to the phase out ozone-depleting substances, including methyl bromide, such as Customs Department (import and export of ODS to non-EU countries), the Labour Education and Training Service, the Ministry of Social Labour, and the Ministry of Education and Science.

2789. Activities on ozone-depleting substances reduction and phase out in Lithuania have included not only work this on methyl bromide but also work that has helped to reduce and/or eliminate CFCs, halon, methyl chloroform and HCFCs. These activities on ozone-depleting substances would not have been possible by the NOU alone. Instead, the NOU has leveraged its effectiveness by drafting legislation that empowers other services (such as Customs officers and inspectors) to undertake work on ODS according to the legislative requirements, and to report the results of their activities.

2790. Prior to joining the EU Lithuania had a strong resolve to reduce and eliminate ozone-depleting substances. This resolve was supported by EC legislation on ozone-depleting substances, in particular Regulation (EC) No 2037/2000. The impact of this legislation on encouraging activities on the reduction and elimination of ozone-depleting substances in Lithuania was described in Section 8.8.10.3.4 on page 503.

2791. For these reasons, Lithuania was assessed as committed and motivated to the elimination of

---

[488] Decree No I-1550. 25 September 1996. Lithuanian Republic Parliament

[489] LAND 50-2004: Ozone-Depleting Substances Management Requirements. In force from 1 May 2004. It implemented Regulation (EC) No 2037/2000 from the date that Lithuania joined the EC.

[490] Head of Chemical Substances, Division of Environmental Quality, MoE. Also responsible for Strategic Approach to International Chemicals Management.

ozone-depleting substances, and the country was assessed as likely to continue with this commitment.

8.8.10.7.3 Stakeholder involvement

2792. The major use of the methyl bromide in Lithuania was for the disinfestation of flour mills and silos. A National Steering Committee was established. It was chaired by the Secretary of the MoE. The National Steering Committee consisted of members from the MoE, the State Plant Protection Service (chemical registration and extension work), the State Grain and Seed Service, the Grain Processors Association, and a fumigation company. The MoE cooperated closely with the Ministry of Agriculture (for the registration of chemicals), the Ministry of Health (for fumigator certification) and the Ministry of Labour (for safety requirements). The State Plant Protection Service has a general mandate for maintaining national plant health and plays major role in the agrochemical registration process, education, training and supervision.

2793. The government of Lithuania had put in place the structure that was responsive to the work on the elimination of methyl bromide in mills. The government has implemented a multi-stakeholder approach that assigned responsibility to different services, administrations and ministries to undertake activities on monitoring and reporting of the use of methyl bromide. The responsibilities of the stakeholders were mandated by national legislation. In this way, the NOU itself could remain relative small with a strategic role, knowing that other stakeholders had assigned responsibilities in ozone layer protection.

8.8.10.7.4 Financial planning

2794. UNEP reported that the funds were correctly managed and transparently accounted for in the project. There was also no concern whatsoever on the financial management and planning as all budgets were managed as expected in the sub-projects and MOUs of the project.

2795. In October 2006 at the International Project Steering Committee Meeting in Sofia, the participants recommended that future projects should put in place procedures to source financial support for the use and refinement of alternatives and technology after the project is completed. In 2007, discussions were initiated on potential EC funds that could be used to support long-term research and validation of alternatives.

8.8.10.7.5 UNEP supervision and support

2796. UNEP reported that reports submitted by the countries in this project were *"… substantive reports presented in a timely manner … they were complete and accurate with a good analysis of project progress and implementation issues".* At the final meeting of the project participants in October 2006 in Plovdiv, there was general appreciation for UNEP's assistance and guidance that had been given to countries during the course of in this project.

8.8.10.7.6 Co-financing and project outcomes & sustainability

2797. There was no requirement for co-finance of the activities of UNDP and UNEP in this programme. However, France committed to provide $50,000 toward the project development costs of UNDP and UNEP, but these funds did not eventuate[491]. The UNEP regional budget included $1,921,929 of in-kind co-finance[492] for non-investment activities, and the UNDP regional budget included expected in-kind contributions of $373,400[493] for investment activities. The amount of co-finance declared by Lithuania for non-investment and investment activities in this project was not available.

2798. In 2008, UNEP reported that co-financing from four out of the five countries exceeded the co-finance envisaged at the start of the project start117. The co-finance was for office space and facilities for national project personnel and international experts working on the project; for participation of Government personnel that implemented project activities; for providing transportation, facilities for installation of equipment, and logistic support to the project; for communications; for personnel for technical assistance, site visits; and for personnel and other

[491] UNEP. 2008. GEF PIR FY2008. 50 pages
[492] UNEP. 2008. UNEP GEF PIR FY 2008 Review 1. For the period 1 July 2007 to 30 June 2008. 50 pp
[493] UNDP. 2003. Total Sector Methyl Bromide Phase Out in Countries with Economies in Transition. GEF – UNDP Project Doc. 29 pp.

resources for the monitoring and evaluation exercises. In the case of Lithuania, UNEP reported that it had yet to quantify its level of co-finance[494].

2799. A significant level of in-kind co-finance demonstrated the commitment of a country to the project and probably increased its "ownership" of the programme. Increased ownership has been shown in other projects to promote sustainability, since the government and commercial commitment is greater than when there is a financial stake in a successful outcome to the project.

2800. Although co-finance is important, there were other factors that were assessed as having a greater impact on the sustainability of the programme than co-finance, such as the EU legislative requirement to eliminate the use of methyl bromide by 31 December 2004 (see Section 8.8.10.3.4 on page 503). However, a sustainable source of funds to support the continued implementation of alternatives, and the refinement of the alternatives, after the project finished was considered very important by the members of the National Steering Committee at their meeting in October 2006. Further monitoring of pest problems may be warranted as a result of global warming which may result in warm-adapted pests extending their southern range northwards toward Lithuania in the future.

8.8.10.7.7 Project implementation delays and impact on project outcomes & sustainability

2801. Procurement of equipment by UNDP Bratislava office was delayed because of UNDP difficulties coordinating between the national Customs authorities and the involvement of UNDP personnel in some of the countries in the project. The variety of rules and practices in the different countries was not anticipated by UNDP, and each country had to be addressed individually in each case, which contributed to the overall delay in procurement and imports.

2802. Although procurement and project closure were delayed, these delays did not affect the national phase out since appropriate registration and legislative instruments were required by EC legislation to be in place, which prevented any prospect of a return to the use of methyl bromide. Restrictions on methyl bromide use, sale and import in Lithuania had been implemented according to Regulation (EC) No 2037/2000 in Lithuania in advance of Lithuania's accession to the EU on 1 May 2004.

2803. The mills in Lithuania have eliminated their use of methyl bromide and largely replaced it with phosphine and some heat treatments. However, the food industry is still dependent on chemical fumigation, which may not be sustainable due the toxicological review required under Regulation (EC) No 91/414 that has led to restrictions on the use of many fumigants and the elimination of many of them.

2804. The inability to register new formulations of traditional fumigants, and to maintain registration for existing fumigants, threatens the ability of users to have access in the longer term to effective pest control procedures. Inappropriate use of phosphine has resulted in insect resistance and reduced its ability to control pests in mills. Despite these problems with continuing use of chemical fumigants, the possibility of going back to methyl bromide is not an option as there are now several legislative instruments in the EU that ban the use of methyl bromide due to its toxic properties, and non-chemical pest control methods for mills have existed for many years.

8.8.10.8 Sub-Project Rating

GF/4040-05-05 Total Sector Methyl Bromide Phase Out in Countries with Economies in Transition - Lithuania		
Criterion	**Evaluator's Summary Comments**	**Evaluator's Rating**
Attainment of project objectives and results	See comments below	

[494] UNEP. 2008. UNEP GEF PIR FY 2008 Review 1. For the period 1 July 2007 to 30 June 2008. 50 pp

GF/4040-05-05 Total Sector Methyl Bromide Phase Out in Countries with Economies in Transition - Lithuania		
Criterion	**Evaluator's Summary Comments**	**Evaluator's Rating**
Sub criteria (in yellow below)		
Effectiveness	Lithuania started the project 10 months after approval; the project was most likely effective in sustaining the phase out of methyl bromide, rather than phasing it out	HS
Relevance	The project was relevant because it reduced and phase out methyl bromide which is ozone depleting; it avoided the need for critical use exemptions; it helped to minimise pesticides in food to comply with marketing standards in the EU; it helped with compliance with EU regulations; and it was in line with recommendations made by the steering committee	HS
Efficiency	Cost-effectiveness was about 90% more than the average cost-effectiveness of MLF-financed methyl bromide phase out projects, mainly because postharvest projects are more expensive than pre-harvest projects	S
Sustainability of Project outcomes (overall rating) Sub criteria (in yellow below)	See comments below	
Financial	Prospects for continued finance on ODS phase out is likely, but likely to be carried out at a relatively modest level given the poor economic conditions that current prevail in Lithuania due to the global economic crisis	S
Socio-Political	Lithuania has put in place the structure that can respond well to the work that phased out methyl bromide	HS
Institutional framework and governance	Range of government organisations involved in Lithuania, and the legislation that was in place, was assessed as sufficient to promote the sustainability of the methyl bromide phase out	HS
Environmental	National and EU legislation, as well as Custom's ODS surveillance procedures, combined to reduce the risk of methyl bromide returning	HS
Achievement of outputs and activities		
Monitoring and Evaluation (overall rating)	See below	

GF/4040-05-05 Total Sector Methyl Bromide Phase Out in Countries with Economies in Transition - Lithuania		
Criterion	**Evaluator's Summary Comments**	**Evaluator's Rating**
Sub criteria (in yellow below)		
M&E Design	Design described by UNDP and UNEP , which was deficient in some areas	S
M&E Plan Implementation (use for adaptive management)	Deficiencies in the design prevented M&E being used as an effective tool for monitoring progress	S
Budgeting and Funding for M&E activities	Budget for UNEP M&E was 6.7% of the overall budget; budget for UNDP component was not evident	S
Catalytic Role	No categorisation required	
Preparation and readiness	Well prepared and ready due in mainly to two previous projects on methyl bromide phase out and effective legislation	HS
Country commitment and motivation*	Committed and motivated to the elimination of ozone-depleting substances, and likely to continue with this commitment	HS
Stakeholder involvement	Multi-stakeholder approach that assigned responsibility to different services, administrations, ministries and commercial organisations	HS
Financial planning	Funds were correctly managed and transparently accounted for in the project	S
UNEP supervision and support**	UNEP had a good working relationship with Lithuania that covered work plan implementation, progress reports and financial reporting	S
Overall Rating		S

Highly Satisfactory (HS); Satisfactory (S); Moderately Satisfactory (MS); Moderately Unsatisfactory (MU); Unsatisfactory (U); Highly Unsatisfactory (HU);
*Motivation replaced TOR '*driveness*'; **Support replaced TOR 'backshopping'

9 Poland

8.9.1 Background

2805. Poland's first free parliamentary elections in 1991 signalled the beginning of elected governments and progress toward a free market economy. The policies introduced by the government from that year onwards promoted Poland's participation in the global economy and expanded the scope of private enterprise[495].

2806. As in many of the countries that became independent of the former Soviet Union, many of them in the early to mid-1990's had steadily reduced imports of ODS, in anticipation of the imminent closure of CFC and halon production in the Russian Federation. They wanted to eliminate their dependency on predominantly Russian imports by putting in place procedures to avoid disruption to the national users of equipment, when the supply in Russia ceased. In Poland's case, consumption of CFCs was reduced from 4,939 ODP-tonnes in 1990 to 1,756 ODP-tonnes in 1995[496], during a period of economic turmoil.

2807. Despite this significant effort, in 1996 Poland was in non-compliance with the Protocol because of its continued consumption of Annex A (Group I, CFCs) and Annex B (Group I, other fully halogenated CFCs) substances. Reported consumption was 549 and 19.5 ODP-tonnes of Annex A and B substances respectively in 1996, instead of zero[2]. Poland also consumed ODS for laboratory and analytical uses without an exemption in 1996, 1997 and 1998. Prior to going into non-compliance, representatives of Poland met with the Protocol's Implementation Committee in 1995 to discuss potential difficulties that Poland foresaw in meeting its obligations under the Montreal Protocol after 1995 "*…because of some doubts concerning the availability of substitutes*[497]". In order to try to remain compliant with the Protocol, Poland in 1995 requested the Parties approve an Essential-Use exemption for 100t of CFCs "*… for technical and economic reasons to prevent thousands of Polish citizens discarding their refrigerators with no immediate prospects for replacing them*."[498] Poland proposed to the Parties that it would not apply for an exemption at any time after 1996, if they were to approve Poland's exemption request for the consumption of CFCs in 1996[4].

2808. Poland's request was declined by the Parties as they believed that allowing an exemption for CFCs for refrigerator servicing "*…would set a bad precedent at a time when alternatives were considered to be available*." At their annual meeting one year later, the Parties approved an essential-use exemption for Poland for each year from 1997 to 2003 for 240 to 382 ODP-tonnes[2] of CFC per year, which brought Poland's consumption of CFCs in these years into compliance with the Protocol. The CFCs were used as the propellant in metered-dose inhalers for the treatment of asthma.

2809. By the time the GEF Project started in 1997, Poland had already acceded to the Vienna Convention, the Montreal Protocol, as well as the London and Copenhagen Amendments in 1996. Poland later ratified the Montreal and Beijing Amendments in 1999 and 2006 respectively.

8.9.2 Projects on methyl bromide

2810. The GEF initially funded a UNEP Project entitled "*Initiating early phase out of methyl bromide in CEITs through awareness raising, policy development and demonstration/training activities*".

---

495 US State Department. 2009.
496 Ozone Secretariat Data Centre, last updated 13 May 2009.
497 Decision VII/15: Compliance with the Montreal Protocol by Poland
498 Seventh Meeting of the Parties. 1995. Page 55.

This was a Medium-Sized Project (MSP) that was designed to assist seven CEITs to reduce their use of methyl bromide[499]. The Project commenced in March 2000 and concluded in September 2002. The total budget was $806,195 consisting of $700,000 from GEF, $37,000 in kind from the government, and $106,195 from Canada.

2811. The Project "*Initiating early phase out of methyl bromide in CEITs through awareness raising, policy development and demonstration/training activities*" consisted mainly of awareness raising activities on the uses of methyl bromide and its alternatives, policy development for methyl bromide phase out, identification of alternatives, diffusion of demonstration results, adoption of alternatives, and implementation of national programmes.

2812. Workshops were held in Hungary (23-25 April 2001, soil uses) and Bulgaria (28-30 May 2002, postharvest uses). These workshops concluded, *inter alia*, that further investment was needed to implement methyl bromide alternatives for to control pests in soil and durable commodities, and possibly for structural fumigation. The workshops also identified a need for non-investment activity such as training in the implementation of policies and measures to limit the use of methyl bromide and to expand the use of alternatives, to support and sustain training on the use, and the development of, alternative techniques.

2813. The usefulness of this initial project was assessed in a survey to all countries that participated in the project. Poland was one of the most active participating countries in this programme and reported[500] that the project was useful for identifying the importance of:

- Developing a robust strategy for phasing out methyl bromide;
- Raising the awareness of the need to phase it out, and the short term remaining to achieve that goal;
- Building reliable databases on consumption and specific information on alternatives;
- Demonstrating practical alternatives that could be used in the short term;
- Using the train-the-trainers concept to leverage training effort to teach as many users as possible on alternatives to methyl bromide;
- Developing longer term non-chemical alternatives; and
- Encouraging registration of new chemicals as early as possible.

2814. This initial project did, however, lay the foundation for further work in Poland by UNDP/UNEP in a project entitled "*Total Sector Methyl Bromide Phase Out in Countries with Economies in Transition*", which aimed to complete the phase out of Non-QPS uses of methyl bromide in six countries. The results of this Project are assessed in this Evaluation Report.

8.9.3 GF/4040-05-05 "Total Sector Methyl Bromide Phase Out in Countries with Economies in Transition"

8.9.3.1 Introduction

2815. The GEF also funded the UNDP/UNEP "*Total sector methyl bromide phase out in countries with economies in transition*" was designed to assist five[501] CEITs to phase out all uses of methyl bromide except quarantine and pre-shipment by 1 January 2005, in accordance with the text of the Copenhagen Amendment of the Montreal Protocol that was relevant to developed countries.

2816. The UNEP budget for the non-investment activities in the regional project was $4,203,754 including $130,500 for project development, $2,151,325 from the GEF and $1,921,929 of in-kind co-finance[502]. The UNDP budget for the investment activities in the regional project was $3,267,075 including $45,000 for project development, $2,848,675 from the GEF and expected in-kind contributions of $373,400[503]. The total budget for the project was therefore $7,470,829.

---

499 GF/4040-00-10 for CEITs Bulgaria, Estonia, Hungary, Latvia, Lithuania, Poland and Slovakia

500 Ausher, R. 2003. Evaluation of the project on initiating the early phase-out of methyl bromide in countries with economies in transition through awareness-raising, policy development and demonstration and training activities. GF/4040-00-10. UNEP Evaluation and Oversight Unit. 42pp.

501 GF/4040-05-05 for CEITS Bulgaria, Estonia, Hungary, Latvia, Lithuania and Poland. Azerbaijan and Uzbekistan were observers. Estonia did not consume methyl bromide

502 UNEP. 2008. UNEP GEF PIR FY 2008 Review 1. For the period 1 July 2007 to 30 June 2008. 50 pp

503 UNDP. 2003. Total Sector Methyl Bromide Phase Out in Countries with Economies in Transition. GEF – UNDP Project Doc. 29 pp.

The regional methyl bromide phase out project was scheduled to commence in May (UNEP) or December (UNDP) 2004 and to conclude in May 2006 (UNEP) or November 2007 (UNDP).

2817. This Regional Project in Poland aimed to phase out 52.97 ODP-tonnes per year of methyl bromide used for pre-harvest and post-harvest applications[504], which was the consumption reported by Poland in 2002. The Regional Project commenced in Poland on 31 March 2005[505] and was completed on 30 June 2008. Actual costs totalled $2,793,318 which consisted of GEF/UNEP $398,834 for capacity building, GEF/UNDP $688,372 for postharvest equipment, GEF/UNDP $499,840 for soil disinfestation equipment, co-finance of $253,164 from commercial partners in cash, and $953,108 of in-kind finance. The objective of the Project was to phase out all uses of methyl bromide except quarantine and pre-shipment (QPS) by 1 January 2005, in accordance with the Copenhagen Amendment of the Montreal Protocol relevant to developed countries.

2818. In 2003, Poland reported a consumption of 36 tonnes of methyl bromide to the Montreal Protocol. Poland reported an 8-year average consumption of 43.9 ODP-tonnes of methyl bromide per year from 1996 to 2003. Poland imported methyl bromide in each of those years[506]. Poland was approved critical uses exemptions[507] for the consumption of methyl bromide for the fumigation of soil for the production of strawberry runners in 2006 (40 tonnes), 2007 (40 tonnes) and 2008 (24.5 tonnes); for the post-harvest fumigation of medicinal herbs and dried mushrooms in 2005 (4.1 tonnes), 2006 (3.56 tonnes), 2007 (1.80 tonnes) and 2008 (1.80 tonnes); and for the post-harvest fumigation of coffee and cocoa beans in 2006 (2.16 tonnes), 2007 (1.42 tonnes) and 2008 (1.42 tonnes). Methyl bromide was not used for any non-QPS uses in Poland from 1 January 2009.

2819. The EU reported methyl bromide consumption on behalf of all Member States including Poland from 2004 onwards, but the amount consumed by Poland was not publicised. It is likely that the project funding in Poland assisted not only with the phase out the critical uses of methyl bromide and but also it probably helped to sustain the phase out of its uses in general.

8.9.3.2 Attainment of objectives and planned results

8.9.3.2.1 Effectiveness

2820. The project that aimed to phase out methyl bromide regionally through a combination of awareness raising activities, policy development assistance, training on alternatives and investment activities, and data collection activities to measure the impact of the project. According to UNEP[508], this included the following performance indicators:

- Provision of methyl bromide publications and materials (with provisions for translation into local languages) to support *awareness-raising* activities;
- Training workshops or modules on *policy development* for the control of methyl bromide (bringing together policy makers, Customs officers, importers, users, producers);
- *Training courses/workshops* to educate stakeholders on alternatives and to develop training strategies for local extension workers on promoting and implementing alternatives;
- *Investment activity* to implement suitable methyl bromide alternatives for control of pests in soil (pre-harvest) and durable commodities (post-harvest); and
- The phase out of non-QPS methyl bromide consumption[509].

2821. The achievement of outputs and activities by Poland, as measured against these performance

---

[504] MB - PIRMBProject08rev1, page 6.

[505] An MOU covered the period 31 March to 31 December 2005, and the Project commenced 1 January 2006. The Project was approved 1 May 2004, endorsed by CEO Nov 2004 and activities in the Project commenced in March 2005.

[506] Consumption of MB was 15 ODP-tonnes/1996; 0/1997; 9/1998; 0/1999; 0.5/2000; 8.8/2001; and zero from 2002

[507] TEAP. 2009. Critical Use Nominations for Methyl Bromide. Annex IV. Part A: Trend in Pre-Plant Soil Applications. Part B: Trends in Post-harvest Structural and Commodity Applications. Period 2005 to 2010. Information supplied by the Ozone Secretariat to MBTOC. Pages 79-83.

[508] UNEP. 2003. GEF PDF Block B Request: *Total Sector MB Phase Out in Countries with Economies in Transition*. Page 9. UNEP-DTIE internal publication. 41 pages.

[509] Included by the evaluators in this report as this was implied but not stated by UNEP.

indicators, are provided in Section 8.9.3.5.1 "*Delivered outputs*" on page 528.

8.9.3.2.2 Relevance

8.9.3.2.2.1 Continued reduction of methyl bromide

2822. The five countries that had reported consumption of methyl bromide, and that were participants in the project "*Initiating early phase out of methyl bromide in CEITs through awareness raising, policy development and demonstration/training activities*", were reported to have reduced their combined consumption of methyl bromide from 120.42 ODP-tonnes at the start of the project to 86.16 ODP-tonnes in 2000.

2823. However, consumption reported in 2001 indicated that for some countries investment assistance was urgently needed to fully phase out methyl bromide. Bulgaria, the Czech Republic, Estonia, Hungary, Latvia, Lithuania, Poland, and Slovakia were the original participants in the project. Bulgaria, Hungary, Latvia, Lithuania and Poland were responsible most of the methyl bromide consumption in the region.

2824. In 2001, three countries (Bulgaria, Latvia and Poland) showed signs of increased methyl bromide consumption. For example, Poland reported a consumption of 38.8 ODP-tonnes in 2000 and 53.0 ODP-tonnes in 2001 which was equivalent to about 37% more methyl bromide in the second year compared to the first. The governments of these countries maintained that without further assistance they would be unable to completely phase out methyl bromide. Other Member States at that time were reducing rather than increasing their use of methyl bromide. Poland was the largest user of methyl bromide in the regional project.

2825. For these reasons, it was relevant for UNEP and UNDP to include Poland in the project to ensure that methyl bromide was phased out and did not increase again in that country.

8.9.3.2.2.2 Compliance with market standards

2826. Farmers in Europe at the time were experiencing market pressures to reduce the environmental impact of their farming practices. European supermarket chains had established a code of practice for agricultural production for fruit and vegetables, called EurepGAP. EurepGAP is a private sector body that sets voluntary standards for the certification of agricultural products globally. These standards were developed in response to consumer concerns about food production standards, pesticides and environmental pollution from agriculture.

2827. Increasingly at that time and even today, the European supermarket chains were requiring farmers/suppliers to comply with these strict standards, if they wished to continue supplying the supermarkets in the future. The standards required suppliers/farmers to justify in writing the use of methyl bromide and other fumigants, and strongly promoted integrated pest management (IPM) and non-chemical methods of controlling pests and diseases.

2828. The project was relevant because it helped to build capacity for the longer-term development of non-chemical alternatives that are suitable for the markets and circumstances in which they operate.

8.9.3.2.2.3 Recommendations for reducing methyl bromide use

2829. The GEF[510] stated that "*…In order to achieve compliance with the Montreal Protocol, a full phase out of all reported (non-QPS) consumption (and production) needs to be achieved by the end of 2004 … consumption needs to be reduced from the current levels … to zero in 2005*". Because methyl bromide was still being consumed in Poland in 2001 just prior to when the project was being formulated[511], Poland was eligible for assistance to completely phase out methyl bromide.

2830. The Workshop on Methyl Bromide Alternatives for Soil Uses (April 2001, Hungary) concluded in part that the deployment of alternatives *"…may need extra financial investment, (with the further) support of the GEF, particularly where the establishment of soil-less production, registration of new biological agents or pesticides, or higher application costs of physical and cultivation costs are involved".* Poland had both pre-harvest and post-harvest uses of methyl

[510] GEF. 2003. GEF Support to Countries with Economies in Transition in Phasing Out of Annex C1 and E Substances of the Montreal Protocol GEF/C.18/Inf.6, page A4

[511] Ozone Secretariat Data Centre. 2009. Latvia reported to the Parties of the Montreal Protocol a consumption of 8.8 ODP-tonnes of methyl bromide in 2001.

bromide, and financial investment was relevant to solve pest problems in both sectors to develop and implement alternatives.

2831. A similar conclusion was reached by working groups at the subsequent meeting in Bulgaria for training in post-harvest alternatives (May, 2002), where participants concluded in part that *"…Alternatives are present, but assistance is required for technology transfer and adaptation to the specific conditions, and to produce new alternatives as the existing ones are not always suitable to replace methyl bromide (under the conditions experienced in the CEITs of the Eastern European region)…".*

2832. The reduction and phase out of methyl bromide in Poland is also consistent with the objectives of the Vienna Convention and the Montreal Protocol, which *requires Parties to take appropriate measures in accordance with the provisions of this Convention and of those Protocols in force to which they are party to protect human health and the environment against adverse effects resulting or likely to result from human activities which modify or are likely to modify the ozone layer*[512].

2833. The GEF established in 1995 an Ozone Layer Depletion Focal Area in response to the Montreal Protocol. The Focal Area has the strategic objective of protecting human health and the environment by assisting countries to phase out their consumption and production of ODS, to prevent emissions of ODS, and to encourage the uptake of alternative technologies and practices according to a country's commitments under the Montreal Protocol. The financial interventions in the GEF Focal Area contribute to the return of the ozone layer to pre-1980 ozone levels, which is expected by 2065.

2834. The reduction and phase out of methyl bromide was a requirement for developed countries such as Poland that had ratified the Copenhagen Amendment in the Montreal Protocol. In addition, the reduction and phase out of methyl bromide was required by 31 December 2004 which was shortly after Poland's accession to the EU on 1 May 2004. The sustained phased out of methyl bromide was therefore relevant for avoiding non-compliance with EU legislation on methyl bromide that applied shortly after accession. Poland avoided non-compliance by applying for, and being approved, critical uses of methyl bromide for specific uses where alternatives had yet to be developed and implemented.

2835. The actions taken by Poland to phase out methyl bromide were therefore relevant to continuing the reductions in methyl bromide use that had been achieved in previous projects, compliance with market standards by implementing production practices that minimised the use of chemicals in the food chain, recommendations for reducing methyl bromide use, compliance with Montreal Protocol, and sustainability of the compliance with EU regulations after accession to the EU.

8.9.3.2.3 Efficiency

2836. The cost-effectiveness as a means of determining 'efficiency' was not relevant to the Institutional Strengthening component of this project (such as advice on the development of policies and measures), as Institutional Strengthening is not normally subject to cost-effectiveness criteria. The GEF/UNEP-UNDP non-investment in this regional project was $4,203,754.

2837. Poland aimed to phase out 52.97 ODP-tonnes (75.7 tonnes) per year of methyl bromide that was used in the pre-harvest and post-harvest sectors. This was the consumption reported in 2002 and it was used by UNEP as the baseline. Poland reported that the GEF/UNDP provided $688,372 for postharvest equipment and $499,840 for soil disinfestation equipment. The total for investment activities in Poland in this project was therefore $1,188,212.

2838. In 2003, which was the last year of methyl bromide consumption data published for Poland and about 15 months before the project commenced on March 2005, Poland reported a methyl bromide consumption of 36.0 ODP-tonnes[513], equivalent to 51.43 tonnes. This was close to the amount phased out as critical uses, which (based on the amounts approved) were 4.1 tonnes in 2005, 45.7 tonnes in 2006, 43.22 tonnes in 2007 and 27.72 tonnes in 2008. Poland's average

[512] Handbook for the Vienna Convention for the Protection of the Ozone Layer - 7th Edition (2006). Article 2: General Obligations.
[513] Ozone Secretariat Data Centre, 3 May 2009

consumption of critical uses over the 4-year period was 30.10 tonnes, which was equivalent to 21.13 ODP-tonnes. Based on the GEF funding for investment activities of $1,188,212 the cost-effectiveness of the project to the GEF for eliminating the use of critical uses of methyl bromide in Poland was therefore an average of $56.23 per ODP-kg per year.

2839. Two other cost-effectiveness calculations are reasonable, based on the UNEP baseline and the UNDP estimate. The cost-effectiveness based on the UNEP 2002 baseline consumption of 52.97 ODP-tonnes was $22.43 per ODP-kg per year. UNDP estimated the cost-effectiveness to the GEF to be about $50 per ODP-kg for the investment component of the regional project, based on the phase out of about 100.2 ODP-tonnes of methyl bromide annually in the region of the participating countries[514].

2840. These cost-effectiveness figures for Poland can be compared with the cost-effectiveness of methyl bromide phase out projects in other countries. The cost-effectiveness reported by the MLF for the phase out of methyl bromide in 31 Developing Countries prior to 2003 ranged from $0.04 to $85.18 per ODP-kg, the price depending mainly on the size of the project and its location[515]. The average cost-effectiveness in 24 completed projects that were assessed by the MLF was $23.55 per ODP-kg of methyl bromide.

2841. The *actual* cost-effectiveness of $56.23 per ODP-kg based on the targeted phase out of an average of 21.13 ODP-tonnes per year was about more than twice the average cost-effectiveness of $23.54 ODP-kg per year of MLF-financed methyl bromide phase out projects described above. The *theoretical* cost-effectiveness of $22.43, based on the UNEP baseline of 52.97 ODP-tonnes per year, was marginally cheaper than the cost-effectiveness of the MLF-financed projects that averaged $23.55 per ODP-kg of methyl bromide.

2842. The average annual cost-effectiveness of the methyl bromide phase out project in Poland was therefore assessed as more expensive in practice ($56.23) but similar in theory ($22.43) to the cost-effectiveness of similar projects undertaken in developing countries ($23.55). It is also worth noting that the reason for the higher practical cost is because projects in the post-harvest sector have higher costs for equipment needed to replace methyl bromide in this sector[516], compared to the pre-harvest sector.

8.9.3.3 Assessment of sustainability of project outcomes

8.9.3.3.1 Financial resources

2843. The institutional arrangements in Poland to address the UNDP/UNEP Regional Project were similar to other countries in the Project. Poland financed the Ozone Layer Protection Unit within the Industrial Chemistry Research Institute in Warsaw. This later became the Project Coordination Unit that was responsible for project management and administration. The MoE was the Executing Agency. National Experts (one on soil topics, the other on postharvest) provided technical advice to all of these bodies. A National Steering Committee provided advice and consisted of representatives from the Ministries and governmental bodies, fumigators, methyl bromide importers and methyl bromide end users.

2844. The Polish government finances these organisations to under activities to reduce and eliminate ozone-depleting substances, and that provide information on ozone-depleting substances to the European Commission in compliance with EU regulations and directives. In this regard, the government had contracted the specialised services of the Ozone Layer Protection Unit to undertake defined work on ozone layer protection. Member States including Poland continue to undertake these activities, not only because of the requirement to comply with national environmental objectives, but also to avoid infringement action which has been undertaken by the European Commission in the past when a Member State has not complied with the requirements of the EU legislation.

2845. For these reasons, the prospects for continuing finance by the government of Poland on activities relating to the reduction and phase out of ozone-depleting substances were assessed

---

[514] UNDP. 2003. Total Sector Methyl Bromide Phase Out in Countries with Economies in Transition. GEF – UNDP Project Document. 29 pp. Page 27

[515] MLF. 2004. Desk Study on Methyl Bromide Projects. UNEP/OzL.Pro/ExCom/43/8. Annex V, pages 36-37.

[516] UNDP. 2003. Total Sector Methyl Bromide Phase Out in Countries with Economies in Transition. GEF – UNDP Project Document. 29 pp. Page 27

as likely. This was expected to continue even during the economic crisis, as Poland's GDP grew by 1.7% making Poland the only European Union economy that did not contract in 2009[517].

8.9.3.3.2 Socio-political

2846. The institutions in Poland that addressed the UNDP/UNEP Regional Project were similar to other countries in the Project. The project was coordinated and managed by the Project Coordination Unit within the Industrial Chemistry Research Institute in Warsaw. The MoE was the Executing Agency. A National Steering Committee provided advice and consisted of representatives from the Ministries and governmental bodies, fumigators, methyl bromide importers and methyl bromide end users.

2847. National Experts (one on soil topics, the other on postharvest) provided technical advice to all of these bodies. In the pre-harvest sector, the State Agricultural Extension Service trained farmers on the use of alternatives to methyl bromide. Representatives from the Service and the State Plant Protection Inspectorate participated in the training sessions. A private company (Imants) and many private companies and growers participated in the training sessions. The training component of the programme is evaluated in Section 8.9.3.5.1.3.2 *Training on pre-harvest alternatives to methyl bromide* on page 529.

2848. In the post-harvest sector, training was delivered by a private company (BM Seminar Germany), and many of the mill owners and operators participated in the training sessions. The training component of the programme is evaluated in Section 8.9.3.5.1.3.3 *Training on post-harvest alternatives to methyl bromide* on page 530.

2849. The University of Environmental and Life Sciences (Wroclaw) provided monitoring and evaluation (M&E) services in the soil sector, and the Institute of Plant Protection (Poznan) provided M&E services in the post-harvest sector.

2850. The MoE cooperated closely with the Ministry of Agriculture (for the registration of chemicals), the Ministry of Health (for fumigator certification) and the Ministry of Labour (for safety requirements).

2851. The government of Poland has put in place the structure that was responsive to the work on eliminating the use of methyl bromide. The government has implemented a multi-stakeholder approach that involves different services, administrations and ministries to undertake activities on monitoring and reporting ODS use.

8.9.3.3.3 Institutional framework and governance

2852. The institutional framework in Poland that addressed the UNDP/UNEP Regional Project was similar to other countries in the Project. The project was coordinated and managed by the Project Coordination Unit within the Industrial Chemistry Research Institute in Warsaw. The Ministry of Environment was the Executing Agency. A National Steering Committee provided advice and consisted of representatives from the Ministries and governmental bodies, fumigators, methyl bromide importers and methyl bromide end users.

2853. The Ministry of Environment was responsible for the governance of the phase out of methyl bromide, which it achieved by drafting legislation that was subsequently adopted and came into force to control the use of methyl bromide. Moreover, restrictions on the use of methyl bromide as a result of the legislations encouraged the adoption of alternatives.

2854. Legislation in Poland that had been adopted prior the start of the project included a tax on CFCs at $30/kg and other ODS (1992), a ban on new halon equipment (1992), a ban on the use of halon in ships (1992), licences for the import/export of all ozone-depleting substances including methyl bromide (1996), and a ban on new equipment on the market containing CFC, HCFCs and halon (1997). The driver for legislation in Poland on ozone-depleting substances was Regulation (EC) No 2037/2000, which came into force in the EU on 30 June 2000. This regulation came into force in Poland on 1 May 2004 when Poland acceded to the EU.

2855. Training growers and mill owners in alternatives and their use was an important element in the

[517] Financial Times. 2010 (February 22). The [Polish] finance minister predicted the economy would grow by 3 per cent [in 2010], compared with pre-crisis rates of 5-6 per cent. The main reason for the reduced forecast was that three-quarters of Poland's exports are sent to the EU, which was only slowly returning to growth. Poland proved resilient due to the "*… hardy nature of its companies, the low level of consumer and corporate debt compared with Western Europe, and a relatively healthy banking system.*"

institutional framework in Poland. The State Agricultural Extension Service was responsible for the training in the pre-harvest sector, and a private company contracted to the Ministry of Environment was responsible for training in the post-harvest sector. The training component of the programme is evaluated in Sections 8.9.3.5.1.3.2 and 8.9.3.5.1.3.3 below.

2856. The government of Poland has maintained the necessary level institutional strength to address ozone layer protection issues across a range of ministries and departments. Legislation in Poland, which was established by the initiative of the MoE and the NOU, now involves different authorities, services, departments and Ministries who monitor and report on the compliance of companies with ozone-depleting substances legislation. The legislation supplements EC legislation on the control and phase out of ozone-depleting substances. Member States including Poland continue to undertake these activities, not only because of the requirement to comply with national environmental objectives, but also to avoid infringement action which has been undertaken by the European Commission in the past when a Member State has not complied with the requirements of the EU legislation.

8.9.3.3.4 Environmental

2857. The main driver affecting the use of methyl bromide in Poland was national and EU legislation that existed at the time of the project that restricted the use of methyl bromide and that required activities by users and Member State competent authorities. The EU legislation has since been superseded by revised legislation that has eliminated the use of methyl bromide altogether.

2858. The environmental legislation that was in force in the EU at the time of the project and until 31 December 2009, and relevant for pre-harvest and post-harvest non-QPS methyl bromide uses in this project, was Regulation (EC) 2037/2000. This legislation required Member States:

- To phase out the placing on the market of non-QPS uses of methyl bromide by 31 December 2004;
- To put in place all precautionary measures practicable to prevent and minimise leakages of methyl bromide from fumigation installations and operations in which methyl bromide is used;
- To define the minimum qualification requirements for the personnel involved in methyl bromide fumigation;
- To require producers, importers and exporters of methyl bromide to report to the European Commission on the quantities of ODS produced, imported and exported annually; and
- To submit annual reports on the use of methyl bromide and its alternatives, critical uses of halons, the use of CFCs in medical products that control asthma, the phase out of halon on ships and in aircraft, and the quantity of ozone-depleting substances recovered, reclaimed, recycled and destroyed.

2859. Poland implemented national legislation that harmonised as much as possible Polish legislation on ODS with Regulation (EC) No 2037/2000 immediately prior to Poland joining the EU on 1 May 2004[518]. This national regulation, that limited the availability of ozone-depleting substances including methyl bromide, also had the secondary important effect of encouraging the development of ODS-free alternatives as a way of controlling pests without the restrictions inherent in the ozone-depleting substances.

2860. New legislation on ODS came into force on 1 January 2010. Regulation (EC) No 1005/2009 replaced Regulation (EC) 2037/2000. Methyl bromide did not meet the safety criteria and was de-registered in the Biocides Directive[519] (non-plant pesticide) from 1 September 2006, and in the Pesticides Directive[520] (Plant Protection Product, PPPD) from 18 March 2009.

2861. Regulation (EC) No 1005/2009 allows MB-QPS stocks[521] to be used until 18 March 2010, but

[518] LAND 50-2004: Ozone-Depleting Substances Management Requirements. In force from 1 May 2004. It implemented Regulation (EC) No 2037/2000 from the date that Lithuania joined the EC.
[519] Regulation (EC) 2032/2003
[520] Decision 2008/753/EC
[521] Articles 12 (1) (2) in Regulation (EC) No 1005/2009 on ODS

limits the quantity to 45 ODP-tonnes from 1 January to 18 March 2010, and none from this date onwards. Up until 18 March, methyl bromide can only be used for QPS at government-approved fumigation sites and only if degassing equipment is in place to recover 80% of the methyl bromide used in the fumigation. Methyl bromide may be used for Emergency Uses[522] for controlling unexpected pest outbreaks, but only if it is first authorised by the European Commission and providing methyl bromide is permitted under the Biocides and Pesticides Directives. Currently, methyl bromide is not permitted in these Directives and *ipso facto* it cannot be used for QPS. Therefore, all uses of methyl bromide including those for QPS are banned in the EU including Poland from 19 March 2010. A total ban of methyl bromide will prevent QPS uses being used off-target for non-QPS uses and help to reinforce the total ban on the use of methyl bromide in Europe.

2862. The main environmental risk that could undermine the implementation of the alternatives in Poland is illegal imports of methyl bromide. However, this seems unlikely since there were three courses in Poland in the past that trained Customs agents all aspects of ODS detection and legislation. Poland wrote a Training Manual for Customs as the first version of the UNEP Manual at the time was not sufficiently comprehensive. The Customs officers received 40 units for detecting ozone-depleting substances which in 2009 were being used at the border entry points. Any ozone-depleting substances intercepted were sent for validation prior to the commencement of infringement action.

2863. In addition to the inspection and monitoring procedures that have been implemented for ozone-depleting substances including methyl bromide, the previous and current regulation on ozone-depleting substances has in place a requirement for Member States to put in place *effective, proportionate and dissuasive* penalties for illegal import of ozone-depleting substances or illegal use of ozone-depleting substances.

2864. The evaluation showed that Poland had put in place legislation, trained customs officers in ODS-detection procedures and equipped them with refrigerant detection equipment. These actions had resulted in the interception of illegal ODS imports. Smugglers had been fined when, for example, HCFCs were illegally imported from Ukraine. Poland has therefore been successful in putting in place legislation and procedures to combat illegal trade.

2865. The risk of methyl bromide import and use re-establishing in Poland was assessed as low, because of the national and EU legislation, as well as Custom's ODS surveillance procedures and reporting that were in place to detect and confiscate any imports of methyl bromide which would be illegal.

8.9.3.4 Catalytic role

2866. The key factors influencing catalytic action are *innovation, demonstration, co-operation and replication*. In this methyl bromide sub-project, the two factors that influenced catalytic action were *co-operation* and *replication*.

2867. The Project Coordination Unit that was established in Poland to coordinate and manage the activities on alternatives to methyl bromide in the pre-harvest and post-harvest sectors, was responsible for encouraging a '*bottom to top*' training process. This increased the capacity of stakeholders to sustain the phase out and to take operational decisions that were both effective and economically viable. The planned activities and the use of *cooperative* methods of delivery laid the foundation for a supportive framework that implemented the alternative technologies.

2868. As a result of the project, UNEP organised the participation of experts from the World Bank and the MLF to promote the *replication* of the training activities developed in this regional project. The training manuals were translated (into Russian), for broader use in the Eastern Europe and Central Asian region, at the cost of the MLF funds of the ECA network.

2869. The World Bank officer responsible for the Ukraine methyl bromide project, as well as the Regional Ozone Network for Europe and Central Asia, were kept informed of the results of this regional project because of its potential to help with the phase out of methyl bromide in other countries through *replication* of all or part of the work that was carried out in the regional project.

[522] Articles 12 (3) in Regulation (EC) No 1005/2009 on ODS

2870. For these reasons, this methyl bromide regional phase out project was assessed as having a useful catalytic role.

8.9.3.5 Achievement of outputs and activities

8.9.3.5.1 Delivered outputs

2871. Section 8.9.3.2.1: *Effectiveness* on page 521 showed the basis for selecting the following achievement or performance indicators:

- Provision of methyl bromide publications and materials (with provisions for translation into local languages) to support *awareness-raising* activities;
- Training workshops or modules on *policy development* for the control of methyl bromide (bringing together policy makers, Customs officers, importers, users, producers)
- *Training courses/workshops* to educate stakeholders on alternatives and to develop training strategies for local extension workers on promoting and implementing alternatives;
- *Investment activity* to implement suitable methyl bromide alternatives for control of pests in soil (pre-harvest) and durable commodities (post-harvest); and
- The phase out of non-QPS methyl bromide consumption.

2872. The delivered outputs are discussed for each of them below.

8.9.3.5.1.1 Awareness raising

2873. The GEF/UNEP Project "*Initiating early phase out of methyl bromide in CEITs through awareness raising, policy development and demonstration/training activities*"[523] focused on the development and translation of public awareness materials, demonstration projects, regional training activities, and policy development. The Project commenced in March 2000 and concluded in September 2002. Poland was one of the most active participating countries in this project.

2874. This later GEF/UNEP Project "*Total sector methyl bromide phase out in countries with economies in transition*" focused on the development and translation of public awareness materials, demonstration projects, regional training activities, and policy development. The demonstration project in Poland tested various chemical and non-chemical combinations on several crops in open field (cabbage, celery and tomato) and in glasshouses (strawberries, peppers). The demonstration work shortened the time for the UNDP/UNEP Regional Project by allowing equipment selection to proceed as soon as the project was approved.

2875. In the post-harvest sector, a range of equipment was used to replace methyl bromide's postharvest uses in fumigation chambers, silos or flour mills. Polish mill owners and fumigators went on study tours to see postharvest operations in Germany, Italy and The Netherlands, which raised the awareness of the equipment that was available and which assisted them with decisions on equipment selection and procurement. Poland believed that awareness raising activities carried out in schools in rural areas was a supplementary activity that helped to promote environmentally-friendly pest control methods.

2876. Raising the awareness of alternatives for growers and mill owners was largely achieved in the training programmes that were delivered in Poland. The State Agricultural Extension Service was responsible for the training in the pre-harvest sector, and a private company contracted to the Ministry of Environment was responsible for training in the post-harvest sector. The training component of the programme is described in Sections 8.9.3.5.1.3.2 and 8.9.3.5.1.3.3 below.

2877. The awareness raising activities on methyl bromide alternatives were part of a larger programme on awareness raising on ozone-depleting substances in general that was undertaken by the NOU in Poland in 1999 and 2000. The Public Awareness Raising Campaign included the design, printing and distribution of materials on ozone layer protection; seminars for journalists; contests and concerts for children and teenagers; design, production and distribution of the

[523] GF/4040-00-10 for CEITs Bulgaria, Estonia, Hungary, Latvia, Lithuania, Poland and Slovakia.

Green Cards; TV reports, animated films and purchase of the rights to "*Hole in the Sky*" video cassette; advertisement in 85 cinemas in Poland for 2 weeks; articles in the press; and 100 CD ROMs on the work of Prozon.

2878. An Impact Assessment Committee reported that the Public Awareness Raising Campaign was successful as it improved the recovery of ozone-depleting substances, promoted a favourable public response on legislation on ozone-depleting substances that was under development at the time, and it likely to have a sustainable impact on future generations that understand the need for the recovery of ozone-depleting substances. However, since a base line was not established, and performance indicators developed to monitor changes relative to the base line, this impact was impossible to verify.

2879. Despite not being able to measure the impact, and for the reasons described above, the awareness raising activities in this project on alternatives to methyl bromide in Poland were assessed as having been delivered.

8.9.3.5.1.2 Policy development

2880. Poland harmonised its national legislation with the legislation of the EU on ozone-depleting substances in advance of its accession to the EU on 1 May 2004. In addition, dissuasive penalties were implemented for violators of the legislation on ozone-depleting substances.

2881. The Polish government has implemented legislation that mandates various government services, administrations and ministries to undertake activities on monitoring and reporting ODS use. The requirements of the stakeholders are supported by legislation. In this way, the NOU itself can remain relative small with a strategic role, on the basis that other stakeholders also contribute to activities on ozone layer protection.

2882. The development of the policies and the implementation of the legislation in Poland were assessed as having been delivered.

8.9.3.5.1.3 Training and workshops

8.9.3.5.1.3.1 Customs training

2883. There were three courses undertaken, prior to the commencement of this the project on the phase out of methyl bromide, that trained Customs agents all aspects of ODS detection and legislation. Poland wrote a Training Manual for Customs as the first version of the UNEP Manual at the time was not sufficiently comprehensive. The Customs officers received 40 ODS detection units which are currently in use at the border entry points. Any ODS intercepted was sent for validation prior to the commencement of infringement action.

2884. These activities by Poland showed that it had put in place legislation, trained customs officers in procedures to detect ozone-depleting substances and equipped them with refrigerant detection equipment. These actions had resulted in the interception of illegal trade in ozone-depleting substances. Smugglers had been fined when, for example, HCFCs were illegally imported from Ukraine. Poland has therefore been successful in putting in place legislation and procedures to combat illegal trade.

8.9.3.5.1.3.2 Training on pre-harvest alternatives to methyl bromide

2885. In Poland, the Regional Project was divided into pre-harvest and postharvest activities that aimed to phase out methyl bromide. Training was an essential and important component of the Project.

2886. An M&E survey carried out before and after the training showed that *after* the course the participants became more aware of the range of alternatives, that they found the costs of alternatives were comparable to methyl bromide, and that they appreciated the requirement to install them as soon as possible.

2887. The main pre-harvest use of methyl bromide was for the production of strawberry runners. Poland produces about 17 million strawberry runner plants annually from about 170 ha. They are shipped to Spain and Italy, and exported to Morocco. There are about 15-20 growers that produce most of the runners. They are in demand because they produce two weeks earlier than locally grown runners.

2888. Dazomet and metam sodium were selected as the chemicals to replace methyl bromide for the treatment of open fields prior to planting strawberry runners. To apply these chemicals, the Regional Project supplied 4 rotary spader machines and two tractors.

2889. Steam treatment was also used as a replacement for methyl bromide to disinfest nematodes in the soil of glasshouses and plastic tunnels that are used to produced ornamental flower crops. Two steam boilers were financed by the Project. To heat the soil, the boiler passes superheated water at 200°C through pipes buried in the soil. Steaming is only used for ornamental crops, as strawberry and tomato are produced on soilless systems.

2890. Fifteen trainers delivered 13 courses to more than 500 farmers. The State Agricultural Extension Service trained farmers on the use of alternatives to methyl bromide. Representatives from Service and the State Plant Protection Inspectorate participated in the training sessions. The government relied on specialised training on the use of equipment delivered by manufacturers of the equipment, such Imants who provided training on the use of the rotary spader technology. There were other companies which received equipment in the Project based on well developed criteria, including Grupa Producentów Owoców i Warzyw Hortus, Gospodarstwo Rolno-Ogrodnicze Wojciech Lechowski, Zamojskie Zakłady Zbożowe, Zarząd Morskich Portów Szczecin-Swinoujscie, PHU Cargofum, Agropest, Agropest Alfa, and Agrochemical Pest. Representatives of many other companies also participated in the training sessions.

Figure 36: Spader showing nematocide bins (red), and details of spades that are damaged by rocks in soil. Solfum, Poland.

8.9.3.5.1.3.3 Training on post-harvest alternatives to methyl bromide

2891. A range of equipment was used to replace methyl bromide's postharvest uses in fumigation chambers, silos or flour mills. Equipment supplied by the Project included ThermoNox™ mobile heating units & electrical distribution system for heating all or part of a mill to arthropod pests, industrial vacuum cleaners to remove dust that harbours arthropod pests, ventilators and blowers to circulate the phosphine, equipment for measuring phosphine concentrations, pest population monitoring equipment, a generator of phosphine gas, a phosphine recirculation J-system and portable fans for use on silos, and materials and equipment for sealing silos and mills.

2892. The companies received equipment in the post-harvest sector based on well-developed criteria. They included Zamojskie Zakłady Zbożowe, Zarząd Morskich Portów Szczecin-Swinoujscie, PHU Cargofum, Agropest, Agropest Alfa, and Agrochemical Pest. Representatives of those and many other companies participated in the training related to the post-harvest use of alternatives.

2893. Six technical training workshops focused on specific methyl bromide-free methods and areas of application e.g., heat treatment in mills, IPM/phosphine. Practical demonstrations were provided on the sites of the end users e.g., flour mill. In the postharvest sector, 241 fumigators, end users and plant protection inspectors participated in the training sessions.

2894. The training programme and workshops on alternatives to methyl bromide in Poland were assessed as having been delivered.

8.9.3.5.1.4 Investment activity

2895. There were two companies that received funding to phase out ODS in Poland in this Regional Project that phased out methyl bromide: Solfum (chemical and bio-control services); and PNOS (seed-producing and marketing company). One other company (Herbapol) was not funded by the GEF Project, but is shown in this report as an example of catalytic action as it was financially assisted by separate funding.

Figure 37: Cocoon for creating low oxygen environment to kill pests on seeds. PNOS Seed Company, Poland.

8.9.3.5.1.4.1 Solfum agricultural services

2896. In 2009 Solfum had 15 staff and offered a range of chemical and bio-control services pest and disease control services to growers. The company used methyl bromide on soil for the last time in 2008 on 30 ha of strawberry runners. From 2009 onwards, metam sodium had fully replaced methyl bromide for soil treatments. The Project provided the company with two rotary spaders and a steam treatment unit for soil disinfestation, and an extensive range of equipment for postharvest pest control.

2897. Solfum reported that the replacement of methyl bromide in this Project in fact saved both the company and the strawberry runner industry. The area of strawberry runner cultivation had increased from 26 ha in 2005 to 100 ha in 2007, despite constant damage (Figure 36) to the spaders by rocks in the ground, and plant losses due to *Verticilium* being 7% more than when methyl bromide was used. The PCU attributed the 4-fold increase to the rotary spaders financed by the Project. The company examined other machinery during the procurement process and remained convinced that the equipment purchased was indeed the best available for the task. Furthermore, if the spaders had not been financed by the Project, jobs and financial returns to not just the company but also the local area would have both been lost.

Figure 38: Cocoon for creating low oxygen environment to kill pests on seeds, with damaged zipper. PNOS Seed Company, Poland.

8.9.3.5.1.4.2 PNOS seed supply

2898. PNOS SA is a state-owned seed-producing and marketing company which had been recently re-structured and which employed 300 staff. Seeds were shipped to Europe and exported to Belarus, Russia and Ukraine via 100 companies and three distribution centres. PNOS had joint ownership of more than 100 varieties of vegetable seed. Seeds certified as organic were produced and marketed.

2899. The Project financed two "GrainPro Cocoons" (Figure 37), each one being an air-tight, two-piece PVC structure joined together with a tongue-&-groove zipper. A vacuum pump extracted the air. Arthropods in or on the seeds stored in bags died as a result of an increase in carbon dioxide and reduction of oxygen due to the respiration of the seeds.

2900. Unfortunately PNOS, local experts and GrainPro had not succeeded in sealing the cocoons due to a fault with the zipper (Figure 38) and holes in the PVC, so they remain unused. The Project Coordination Unit attributed this failure to inadequate pre-purchase testing and unsatisfactory

performance by GrainPro to rectify a faulty product. Even if the cocoons were to become operational, additional finance would be required to keep them in a constant temperature room above 20°C, as this is the temperature required to kill the pests in a reasonable time. The requirement for a constant temperature room was not foreseen in the Project.

2901. Fumigation with phosphine is an alternative treatment to methyl bromide and the GrainPro cocoons. A speedbox for phosphine was provided to PNOS by the Project, but it could be used as the registration expired in 2008. Re-registration is expected by July 2009. PNOS plans to test phosphine treatment of seeds using methods already registered in Poland, which is used by 5-7 other seed companies operating in Poland.

2902. A commercial vacuum cleaner to reduce dust and mites in the packing facility was also provided by the Project. It was reported by PNOS to be the only equipment that was usable and that was effective.

2903. For the reasons described above, the investment activities in the regional project in Poland were assessed as having been delivered.

8.9.3.5.1.5 The phase out of methyl bromide consumption

2904. Poland phased out the consumption of methyl bromide from 1 January 2009 and therefore did not meet the objectives of the Regional Project which aimed to complete the phase out by 1 January 2005. Poland's use of methyl bromide over this 4 year period was in compliance with the requirements of the Montreal Protocol, as the Parties had approved the critical uses of methyl bromide in Poland each year for this period. Poland's ability to engage at a regional level on ways to assess, manage and ultimately to reduce ODS was enhanced by the Project.

8.9.3.5.2 Awareness about ODS, ODS substitute technology, and strengthening of institutional capacities to achieve the ODS phase-out

2905. The extensive work in Poland to increase the awareness of ozone layer depletion was described in Section 8.9.3.5.1.1 *Awareness raising* on page 528. The work on methyl bromide substitutes in the pre-harvest and post-harvest sectors was described in Section 8.9.3.5.1.4 *Investment activity* on page 531.

2906. The capacity of the Ozone Layer Protection Unit, and later the Project Coordination Unit, to respond to projects that reduced and eliminated ozone-depleting substances, was increased by several GEF-funded projects. The first was a GEF/World Bank Project that targeted all ODS for phase out except methyl bromide and HCFCs. The second was a small Project that aimed to reduce the use of methyl bromide, which was a followed by this third and altogether larger Project on methyl bromide which aimed to phase it out.

2907. The Project Coordination Unit successfully coordinated and managed the activities in this project of several government organisations and a private training contractor that delivered information on a range of suitable alternatives to stakeholders. The combination of training workshops and practical activities in Poland, using both government and commercial sources of information, expedited the uptake of the alternatives and the subsequent elimination of the critical uses of methyl bromide.

8.9.3.5.3 Authority / credibility, necessary to influence policy and decision-makers

2908. The Project Coordination Unit in Poland had the authority / credibility, necessary to influence policy and decision-makers, which was shown mainly through the NOUs actions and ability:

- To provide methyl bromide publications and materials to support *awareness-raising* activities;
- To implement *policies and measures* to control of methyl bromide, bringing together policy makers, Customs officers, importers, users, producers;
- To coordinate *training courses/workshops* to educate stakeholders on alternatives and to develop training strategies for local extension workers on promoting and implementing alternatives;
- To encourage *investment activity* to implement suitable methyl bromide alternatives for control of pests in soil (pre-harvest) and durable commodities (post-harvest); and

– The phase out of non-QPS methyl bromide consumption.

2909. This credibility has been established by the Project Coordination Unit within the Ministry of Environment that cooperated with a diverse range of government bodies in Poland that were involved in the reduction and phase out of ozone-depleting substances (Section 8.9.3.3.2 *Socio-political* on page 525 described these bodies). The Project Coordination Unit was assessed as capable of carrying out tasks on methyl bromide reduction and phase out due to a combination of political, technical and administrative expertise.

8.9.3.6 Assessment of monitoring and evaluation systems

8.9.3.6.1 Monitoring and evaluation design

8.9.3.6.1.1 UNDP

2910. UNDP took responsibility for the monitoring and evaluation of the investment component. At the end of each project year, the UNDP Montreal Protocol Unit aimed to evaluate the degree to which the objectives of the investment project had been achieved. Supervision missions were planned to be undertaken by relevant experts appointed by UNDP as necessary. The UNDP monitoring and evaluation activities were to be in addition to the normal monitoring and evaluation activity in the project undertaken as standard UNDP procedures.

In the participating countries, independent bodies were identified to also be responsible for M&E activities, as it was considered important to reduce the implementation period to meet the phase out deadlines. The M&E body was designed to act as a continuous management tool, visiting MB users, identifying success and failure factors, and providing information to the Project Coordination Unit and particularly feedback to the Steering Committee and Technical Committee, consultants and Implementing Agencies. The implementation, coordination and monitoring arrangements for the UNEP/UNDP/GEF Project[524] were shown in Figure 20 on page 224.

8.9.3.6.1.2 UNEP

2911. UNEP designed an annual monitoring and evaluation format to assess the non-investment activities, and also provided a Final Assessment design which aimed to report on the results of the project.

8.9.3.6.1.3 Annual evaluation by UNEP

2912. UNEP completed a '*Project Performance and Risk*' Table annually that measured and rated progress toward achieving the project objectives and assessed implementation progress. The progress was reported for each of the countries individually.

2913. The attainment of the project objective, which was '*preservation of the ozone layer*', was measured against the outcome of a '*Sectoral phase out of methyl bromide in countries as required by the schedule of the Montreal Protocol*'. This outcome was defined as uses that were non-QPS and non-CUE, as both QPS and CUEs were permitted under certain conditions.

2914. UNEP's M&E design[525], which aimed to annually measure implementation progress, referenced the requirement to monitor '*outputs*' (Table 72, column 2). UNEP also reported on progress with the implementation of the investment activity that was under the responsibility of UNDP.

Table 52: UNEP-designed "outputs" and "indicators" that were used to monitor progress and evaluate success in the methyl bromide phase out project implemented in Bulgaria

NO	OUTPUT	INDICATOR
Column 1	**Column 2**	**Column 3**
Document	*Project Performance and Risk Final Evaluation*	*Final Evaluation*
1	Development and implementation of cost-	Permanent National Steering

[524] From: UNDP. 2003. Total Sector Methyl Bromide Phase Out in Countries with Economies in Transition. GEF – UNDP Project Document. 29 pp. Page 25.

[525] UNEP. 2008. GEF PIE FY 2008 (for the period 1 July 2007 to 30 June 2008).

NO	OUTPUT	INDICATOR
Column 1	**Column 2**	**Column 3**
Document	*Project Performance and Risk Final Evaluation*	*Final Evaluation*
	effective, sustainable, national phase out coordination structures and mechanisms to carry out the project work, cope with future methyl bromide phase out problem areas, and sustain phase out post-project	Committee, Technical Group, and trained extension service and user groups in countries at project end; registration of additional pest control products where needed; implementation of additional policy measures where needed.
2	Rapid transfer of replacement technologies to MB users, including installation of equipment and participatory training at local level, focusing on a quick replacement for the 2005 growing season to permit country compliance with the Montreal Protocol, [focus on non-chemical and IPM MB alternatives from 2006 onwards][526] [using fumigants/chemicals as necessary][527]	Replacement of MB use in sectors by chemical and non-chemical alternatives at the end of the project
3	Enhanced awareness and confidence of MB users and other stakeholders in the phase out process, through the monitoring of the efficacy and economic performance of alternatives, and increased ability of users to manage pest control problems and find solutions	Detailed regular reports by the Project Coordination Unit and the National M&E Unit on the progress of the MB replacement amongst MB users across sector and sub-sectors. Survey reports of the national M&E Unites, will include investigations into the mindset of the MB users towards the project and phase out exercise
4	Capacity building for the development of more environmentally friendly MB alternatives (primarily based on non-chemical methods), reducing dependency on fumigants/chemical alternatives to ensure sustainability in the long term	Reports by the Project Coordination Unit and the National M&E Unit on the progress of non-chemical and IPM MB alternatives amongst MB users across sector and sub sectors

2915. UNEP also completed annually a '*Risk Factor*' Form, which was a combination of text and check boxes. The Project Manager and the Task Manager assigned ratings to the perceived risk as either '*low, medium, substantial, high, not applicable or to be determined*' for a range of project criteria: Project Management (Management structure, governance structure, internal communications, work flow, co-finance, budget, financial management, reporting, stakeholder involvement, external communications, short/long term balance, science and technological issues, political influences, other); and Project Context (political stability, environmental conditions, social/cultural/economic factors, capacity issues, other).

2916. UNEP also completed a '*Rating Monitoring and Evaluation*' Form, including the M&E activities that were carried out during the reporting period. The mainly text answers in this section covered a broad range of issues, such as the quality of the initial baseline methyl bromide consumption, the usefulness of the indicators that were used to assess performance, any challenges faced by UNEP to obtain data that were required to assess the indicators, and lessons learnt in regard to M&E.

[526] Text in UNEP "Annual Evaluation" but not "Final Evaluation"
[527] Text in UNEP "Final Evaluation" but not "Annual Evaluation"

8.9.3.6.1.4 Final Evaluation

2917. UNEP's M&E design[528], which aimed to measure the overall success of the project, referenced the requirement to monitor '*outputs*' (Table 72, column 2) and '*indicators'* (Table 72, column 3). The '*indicators'* were used by UNEP only for the Final Evaluation and they were not used in the Annual Evaluation. UNEP also reported on the overall success of the investment activity that was under the responsibility of UNDP.

8.9.3.6.1.5 Evaluation comments on M&E design

2918. The following comments address the ability of the M&E design to track and monitor progress toward achieving the project's objectives:

- The annual implementation progress was not measured against the performance indicator, and it was difficult to see how progress was therefore determined;
- The output often contained more than one element (e.g., cost-effectiveness, coordination, structures/mechanisms, future problem areas), but the response by UNEP addressed some of them;
- Some elements were used in the as an output, but a performance indicator was not developed to measure the output e.g. cost-effectiveness[529];
- '*Problems in delivering outputs'* was a column on the Form that was rarely if ever completed by UNEP, which suggested that the projects had no difficulties achieving the outputs required;
- '*Expected completion date'* was a column on the Form that was rarely if ever completed by UNEP, which showed that SMART indicators were not used;
- The column format resulted in very long reports because for most of the form only about one-quarter of the page could be used, which made reading the form difficult;
- One Risk Factor table was completed for all five countries involved in the project, whereas in reality the risks were not uniform for all countries;
- The methyl bromide baseline for the project did not take account of the latest consumption data reported to the Ozone Secretariat at the time of the initiation of the project, which resulted in greater expenditure than needed to eliminate less methyl bromide than originally determined by the baseline;
- The evaluation of the M&E undertaken during the project was helpful as it assessed the status and quality of the M&E procedures; and
- The indicators used in the Final Evaluation should have been used to measure performance in the Annual Evaluation.

2919. These limitations in the M&E design were assessed as reducing the ability of UNEP to assess the progress in the implementation of the project that aimed to introduce alternatives to methyl bromide in Lithuania.

2920. UNDP's Monitoring and Evaluation Plans were contained in Annex 5A: *Monitoring, Progress Reporting and Evaluation* and Annex 5B: *Terms of Reference for the Regional/International Project Steering Committee.* These Annexes were omitted from the UNDP Project Document and could not be evaluated.

8.9.3.6.2 Monitoring and evaluation plan implementation

2921. The M&E plans (Annual M&E and Final M&E) were implemented by UNEP, as evidenced by the reports provided to the evaluators. There were no reports that were made available to the evaluators from UNDP.

2922. Although the design of the M&E plan had limitations, its value lay in the 'follow-up' by UNEP that clearly signalled to participants that their progress in this project was being monitored and

[528] UNEP. 2008. Project Final Report – Bulgaria. 8 pp.

[529] The cost-effectiveness of alternatives to methyl bromide is very difficult to measure as it depends on the timing of the market, the methods used by the farmer, the level of pest infection at the time, and many other factors. At no stage was the financial value addressed, suggesting that cost-effectiveness was addressed superficially.

evaluated. In addition, UNEP required reporting from participants on progress, which was then used to in these annual reports, and workshops were held to share information and keep the project on track.

8.9.3.6.3 Budgeting and Funding for monitoring and evaluation activities

2923. UNEP budgeted $10,000 for the "*…risk evaluation and development of the monitoring and evaluation strategy…*", and $5,000 for the "*… Evaluation Report (including survey results, needs (technical, financial, policy, training), awareness strategy, identification of co-funding partners, preliminary risk evaluation results…*". These direct costs associated with M&E activities may have also been supplemented by UNEP's activities in general, in their role as Project Coordinator/Consultant. UNDP also was assigned a budget of $45,000 for travel and national consultants, but funds for M&E were not separately identified.

2924. The funding for M&E represents 6.7% ($15,000 of $225,000) of the total budget which, for an important activity, appeared to be relatively small. There was no information on budget versus expenditure and therefore it was not possible to assess the timing of the funding and compliance of expenditure with the budget assigned.

2925. The budget assigned by UNDP for M&E activities was provided in the Annex to the Project Document, but this was omitted from the document that was made available for assessment.

8.9.3.6.4 Long-term monitoring

2926. There was no requirement for long term monitoring in this project. However, Poland as a Member State of the EU has national reporting obligations under EU legislation on methyl bromide that it is imported or produced for feedstock and process agent uses[530]. Other uses of methyl bromide are no longer permitted under EU legislation after 18 March 2010, and therefore there are no other reporting requirements related to methyl bromide.

2927. Article 7 "*Reporting of data*" in the Montreal Protocol requires Parties to report by 30 September each year on their consumption and production of ODS in the previous year. Poland reported 2003 consumption data to the Montreal Protocol, but consumption data for 2004 onwards was reported by the European Commission on behalf of the EC, including Poland as a new Member State.

2928. In addition, Decision XV/15 that was agreed in 2003 encouraged Parties to forward data on consumption and production to the Secretariat as soon as the figures became available, and preferably by 30 June each year, rather than 30 September in order to facilitate the work of the Protocol's Implementation Committee. The Implementation Committee has not remarked on any aspects of data reporting by Poland, which suggested that reporting had been timely and accurate. The Ozone Secretariat reported in 2009 that most Parties complied with the voluntary June deadline.

2929. Data reporting by the EU to the Montreal Protocol on methyl bromide consumption is the most important action on long-term monitoring. Zero consumption reported by Poland to the EU would result in zero consumption being reported by the EU to the Montreal Protocol. An EU report of zero consumption would indicate that methyl bromide has been phased out in the EU including Poland, and continual reporting of zero consumption annually by the EU would indicated that the phase out has been sustained.

2930. Data reporting, and the infrastructure necessary for this, is expected to continue for ozone-depleting substances in general and for specific methyl bromide uses as described above. The costs for these data reports are expected to be included in the annual budget by the government of Poland for work assigned to the Project Coordination Unit.

8.9.3.7 Assessment of processes that affected attainment of project results

8.9.3.7.1 Preparation and readiness

2931. The main activity that indicates preparation and readiness for a project is the legislation that was in place in Poland prior to the start of the project to control methyl bromide, and the government and commercial infrastructure necessary to implement alternatives to methyl

[530] Article 27 of Regulation (EC) No 1005/2009 on Substances that Deplete the Ozone Layer that came into force on 1 January 2010

bromide that was in place in Poland prior to the start of the project.

2932. The Ministry of Environment in Poland was responsible for the governance of the phase out of methyl bromide, which it achieved by drafting legislation that was subsequently adopted and came into force to control the use of methyl bromide. Moreover, restrictions on the use of methyl bromide as a result of the legislations encouraged the adoption of alternatives.

2933. Legislation in Poland that had been adopted prior the start of the project included a tax on CFCs and other ozone-depleting substances (1992), a ban on new halon equipment (1992), a ban on the use of halon in ships (1992), licences for the import/export of all ozone-depleting substances including methyl bromide (1996), and a ban on new equipment on the market containing CFC, HCFCs and halon (1997). The driver for legislation in Poland on ozone-depleting substances was Regulation (EC) No 2037/2000, which came into force in the EU on 30 June 2000. This regulation came into force in Poland on 1 May 2004 when Poland acceded to the EU. Poland had to have harmonised its legislation with that of the EU prior to acceding to the EU. This was achieved before the start of the regional project, and therefore Poland was assessed as ready and prepared for the project that eliminated the use of methyl bromide.

2934. An earlier project entitled "*Initiating early phase out of methyl bromide in CEITs through awareness raising, policy development and demonstration/training activities*" had helped to set up the infrastructure that was needed to implement the current project. That project had been instrumental in establishing a team in Poland that consisted of specialists on alternatives to methyl bromide, trainers to deliver workshops on alternatives, government ministries that were monitoring and reporting on the use of methyl bromide, awareness raising activities, and policy development. Commercial companies were involved in the workshops.

2935. Poland's use of methyl bromide was the largest of all countries in the regional project. Its average consumption of methyl bromide for critical uses over the 4-year period was 30.10 tonnes. Therefore of all the countries involved, Poland faced the most difficult task because of the relatively large quantity that needed to be eliminated and, moreover, the methyl bromide was being used for purposes where no alternatives had been developed. To eliminate this methyl bromide, Poland had to break new ground and develop alternatives that were technically and economically feasible.

2936. Poland was assessed as prepared and ready for this project, mainly because of two previous projects on ozone-depleting substances, and due to legislation that had been put in place to control methyl bromide and other ozone-depleting substances. The government and commercial infrastructure necessary to implement alternatives to methyl bromide were also in place well before the start of the project.

8.9.3.7.2 Country commitment and motivation

2937. The country commitment and motivation can be determined by the government commitment to funding of activities on ozone layer protection. Poland has financed a Project Coordination Unit since the late 1990s that contains two staff within the Industrial Chemistry Research Institute in Warsaw. In addition, the time of an official within the Ministry of Environment is also funded for work on ozone-depleting substances including participation at national and international meetings and conferences, and cooperation with the Ministry of Economy in drafting and reviewing national and EU legislation.

2938. Besides the Ministry of Environment and the Project Coordination Unit, several other organisations in Poland participated activities related to the phase out ozone-depleting substances, including methyl bromide, such as the Ministry of Agriculture and Rural Development, the Ministry of Economy, the Ministry of Finance, the Ministry of Health, the Ministry of Labour and Social Policy, the Ministry of National Education, and the Ministry of Regional Development.

2939. Activities on ozone-depleting substances reduction and phase out in Poland have included not only work this on methyl bromide but also work that has helped to reduce and/or eliminate CFCs, halon, methyl chloroform and HCFCs. These activities on ozone-depleting substances would not have been possible by the Project Coordination Unit alone. Instead, the Project Coordination Unit and the Ministry of Environment have leveraged their effectiveness by drafting legislation that empowers other services (such as Customs officers and inspectors) to

undertake work on ozone-depleting substances according to the legislative requirements, and to report the results of their activities.

2940. Prior to joining the EU Poland had a strong resolve to reduce and eliminate ozone-depleting substances. This resolve was supported by EC legislation on ozone-depleting substances, in particular Regulation (EC) No 2037/2000. The impact of this legislation on encouraging activities on the reduction and elimination of ozone-depleting substances in Poland was described in Section 8.9.3.3.4 on page 526.

2941. For these reasons, Poland was assessed as committed and motivated to the elimination of ozone-depleting substances, and the country was assessed as likely to continue with this commitment.

8.9.3.7.3 Stakeholder involvement

2942. The major use of the methyl bromide in Poland was for the disinfestation strawberry runners (86.5%), with relatively minor quantities used for postharvest treatments (9.3% for herbs and mushrooms, 4.1% for coffee and cocoa).

2943. A National Steering Committee was established. It was chaired by the Secretary of the Ministry of Environment. The National Steering Committee was established that provided advice to the Ministry of Environment and the National Steering Committee. It consisted of representatives from the Ministries and governmental bodies, fumigators, methyl bromide importers and methyl bromide end users.

2944. The University of Environmental and Life Sciences (Wroclaw) provided monitoring and evaluation (M&E) services in the soil sector, and the Institute of Plant Protection (Poznan) provided M&E services in the post-harvest sector.

2945. State Agricultural Extension Service trained farmers on the use of alternatives to methyl bromide. Members of the Service and the State Plant Protection Inspectorate also participated in the training sessions. A private company that supplied the soil equipment (Imants) and a company that provided training for postharvest specialists (BM Seminar) were also key organisations that supported the government by delivering the training requirements.

2946. Private companies that were involved in the soil sector and post-harvest sector participated in the training. The companies are listed in Sections 8.9.3.5.1.3.2 *Training on pre-harvest alternatives to methyl bromide* and 8.9.3.5.1.3.3 *Training on post-harvest alternatives to methyl bromide.*

2947. The government of Poland had put in place the structure that was responsive to the work on the elimination of methyl bromide in the pre-harvest and post-harvest sectors. The government has implemented a multi-stakeholder approach that assigned responsibility to different services, administrations and ministries to undertake activities on monitoring and reporting of the use of methyl bromide. The responsibilities of the stakeholders were mandated by national legislation. In this way, the Project Coordination Unit itself could remain relative small with a strategic role, knowing that other stakeholders had assigned responsibilities in ozone layer protection.

8.9.3.7.4 Financial planning

2948. UNEP reported that the funds were correctly managed and transparently accounted for in the project. There was also no concern whatsoever on the financial management and planning as all budgets were managed as expected in the sub-projects and MOUs of the project.

2949. In October 2006 at the International Project Steering Committee Meeting in Sofia, the participants recommended that future projects should put in place procedures to source financial support for the use and refinement of alternatives and technology after the project is completed. In 2007, discussions were initiated on potential EC funds that could be used to support long-term research and validation of alternatives.

8.9.3.7.5 UNEP supervision and support

2950. NEP reported that reports submitted by the countries in this project were "*… substantive reports presented in a timely manner … they were complete and accurate with a good analysis of project progress and implementation issues".* At the final meeting of the project participants in October 2006 in Plovdiv, there was general appreciation for UNEP's assistance and guidance that had

been given to countries during the course of in this project.

8.9.3.7.6 Co-financing and project outcomes & sustainability

2951. There was no requirement for co-finance of the activities of UNDP and UNEP in this programme. However, France committed to provide $50,000 toward the project development costs of UNDP and UNEP, but these funds did not eventuate[531]. The UNEP regional budget included $1,921,929 of in-kind co-finance[532] for non-investment activities, and the UNDP regional budget included expected in-kind contributions of $373,400[533] for investment activities.

2952. In this project, Poland reported that actual costs totalled $2,793,318 which consisted of $398,834 from UNEP for capacity building, $688,372 from UNDP for postharvest equipment, $499,840 from UNDP for soil disinfestation equipment, and co-finance of $253,164 from commercial partners in cash. The amount of in-kind finance was not declared by Poland.

2953. In 2008, UNEP reported that co-financing from four out of the five countries exceeded the co-finance envisaged at the start of the project start[117]. The co-finance was for office space and facilities for national project personnel and international experts working on the project; for participation of Government personnel that implemented project activities; for providing transportation, facilities for installation of equipment, and logistic support to the project; for communications; for personnel for technical assistance, site visits; and for personnel and other resources for the monitoring and evaluation exercises.

2954. A significant level of o-finance demonstrated the commitment of a country to the project and probably increased its "ownership" of the programme. Increased ownership has been shown in other projects to promote sustainability, since the government and commercial commitment is greater than when there is a financial stake in a successful outcome to the project.

2955. Although co-finance is important, there were other factors that were assessed as having a greater impact on the sustainability of the programme than co-finance, such as the EU legislative requirement to eliminate the use of methyl bromide by 31 December 2004 (see Section 8.9.3.3.4 on page 526). However, a sustainable source of funds to support the continued implementation of alternatives, and the refinement of the alternatives, after the project finished was considered very important by the members of the National Steering Committee at their meeting in October 2006. Further monitoring of pest problems may be warranted as a result of global warming which may result in warm-adapted pests extending their southern range northwards toward Poland in the future.

8.9.3.7.7 Project implementation delays and impact on project outcomes & sustainability

2956. The Regional Project was approved 1 May 2004, endorsed by CEO Nov 2004 and activities in the Project commenced in March 2005. It commenced in Poland on 31 March 2005 (initially under an MOU) and was completed on 30 June 2008. A Memorandum of Understanding between the Ministry of Environment and the Implementing Agencies covered the period 31 March to 31 December 2005, and the Project commenced 1 January 2006. The MOU process allowed Poland to commence the project within 4 months of the project being endorsed, which indicated that any delay was minimised.

2957. However, there were other factors that contributed to the project outcome and sustainability. Appropriate legislation that controlled ozone-depleting substances was required to be in place prior to accession on 1 May 2004. In addition, Poland had registered the use of key chemicals as alternatives to methyl bromide. The combination of legislation and registrations limited the prospects of a return to the use of methyl bromide. Restrictions on methyl bromide use, sale and import in Poland had been implemented according to Regulation (EC) No 2037/2000 in Poland in advance of Poland's accession to the EU on 1 May 2004.

2958. The mills in Poland have eliminated their use of methyl bromide and largely replaced it with phosphine and some heat treatments. Dazomet and metam sodium were selected as the chemicals to replace methyl bromide for the treatment of open fields prior to planting strawberry runners. To apply these chemicals, the UNDP/UNEP Regional Project supplied 4

---

[531] UNEP. 2008. GEF PIR FY2008. 50 pages
[532] UNEP. 2008. UNEP GEF PIR FY 2008 Review 1. For the period 1 July 2007 to 30 June 2008. 50 pp
[533] UNDP. 2003. Total Sector Methyl Bromide Phase Out in Countries with Economies in Transition. GEF – UNDP Project Doc. 29 pp.

rotary spader machines and two tractors. The area of strawberry runner cultivation increased from 26 ha in 2005 to 100 ha in 2007. The PCU attributed the 4-fold increase in cultivated area of runners to the rotary spaders financed by the Project. Furthermore, if the spaders had not been financed by the Project, jobs and financial returns to the local area would have both been lost.

2959. The soil sector in Poland is completely dependent on chemical fumigation, whereas the post-harvest sector is at least partly dependent on chemical fumigation but other non-chemical methods can be used. Chemical fumigants may not be available in the future due the toxicological review required under Regulation (EC) No 91/414 which has led to restrictions on the use of many fumigants and the elimination of many of them.

2960. Solfum said that deregistration of metam sodium as a result of the ongoing review of fumigants in the EU would be financially disastrous for the company and the farmers, as potential replacements such as 1,3-dicloropicrin and chloropicrin were not registered in Poland. In Poland, metam sodium is the only chemical that can be used in the rotary spaders. The Agricultural Ministry was not fully engaged in the Project, particularly on issues related to the registration of chemicals. The bio-control procedures were considered the most sustainable, but they were not commercially available and had to be developed. Solfum was not aware of any chemical products or non-chemical procedures that were available on the market that could replace metam sodium.

2961. From 1 January 2009, methyl bromide has been phased out for all uses in the EU except internationally permitted uses such as QPS, and even this will be banned in the first quarter of 2010. The phase out of methyl bromide may not be sustainable as it has been replaced by another fumigant (metam sodium) which itself may be banned. Even the use of this metam sodium is costly to the company, compared to using methyl bromide, because the fumigation equipment (rotary spaders) that was used to inject the fumigant into the ground was frequently damaged by rocks in the field. Replacement blades needed to be welded onto the unit after every 2-3 ha of spading. The repairs took 2-3 days each time, resulting in significant downtime.

2962. The inability to register new formulations of traditional fumigants, and to maintain registration for existing fumigants, threatens the ability of users to have access in the longer term to effective pest control procedures. Inappropriate use of phosphine has resulted in insect resistance and reduced its ability to control pests in mills. Despite these problems with continuing use of chemical fumigants, the possibility of going back to methyl bromide is not an option as there are now several legislative instruments in the EU that were introduced from 2006 to 2010 that ban the use of methyl bromide due to its toxic properties, and non-chemical pest control methods for mills have existed for many years.

8.9.3.8 Sub-Project Rating

GF/4040-05-05 Total Sector Methyl Bromide Phase Out in Countries with Economies in Transition - Poland		
Criterion	**Evaluator's Summary Comments**	**Evaluator's Rating**
Attainment of project objectives and results Sub criteria (in yellow below)	See comments below	
Effectiveness	Effective in meeting the performance indicators for awareness raising, training, policy development, and investment activity to eliminate critical uses of methyl bromide	S
Relevance	Reductions in methyl bromide achieved in previous projects, compliance with market standards by implementing production practices that minimised the use of	HS

GF/4040-05-05 Total Sector Methyl Bromide Phase Out in Countries with Economies in Transition - Poland		
Criterion	**Evaluator's Summary Comments**	**Evaluator's Rating**
	chemicals, consistent with recommendations for reducing methyl bromide use, compliance with Montreal Protocol, and sustainability of the compliance with EU regulations after accession to the EU.	
Efficiency	More expensive in practice ($56.23) but similar in theory ($22.43) to the cost-effectiveness of similar projects undertaken in developing countries ($23.55)	S
Sustainability of Project outcomes (overall rating) Sub criteria (in yellow below)	See comments below	
Financial	Prospects for continuing finance by the government of Poland on activities relating to the reduction and phase out of ozone-depleting substances were assessed as likely. This was expected to continue even during the economic crisis, as Poland's GDP grew by 1.7% making Poland the only European Union economy that did not contract in 2009	S
Socio-Political	Socio-political structure that was responsive to the work on eliminating the use of methyl bromide, and the use of a multi-stakeholder approach that involved different services, administrations and ministries to undertake activities on monitoring and reporting ODS use	S
Institutional framework and governance	Poland has maintained the necessary level institutional strength to address ozone layer protection issues across a range of ministries and departments; national legislation supports EC legislation on the control and phase out of ozone-depleting substances	HS
Environmental	Risk of methyl bromide import and use re-establishing in Poland was assessed as low, because of the national and EU legislation, as well as Custom's ODS surveillance procedures and reporting that were in place	HS
Achievement of outputs and activities		
Monitoring and Evaluation (overall rating) Sub criteria (in yellow below)	See below	
M&E Design	UNDP and UNEP M&E design present; but	S

GF/4040-05-05 Total Sector Methyl Bromide Phase Out in Countries with Economies in Transition - Poland		
Criterion	**Evaluator's Summary Comments**	**Evaluator's Rating**
	UNEP design indicated some deficiencies	
M&E Plan Implementation (use for adaptive management)	Could not find information on the implementation of the UNDP M&E plan; UNEP plan was basically implemented but deficiencies in the design prevented it full use to assist project to be completed	S
Budgeting and Funding for M&E activities	M&E budget was 6.7% of total UNEP and UNDP project development budget; budget for UNDP was in the Annex to the Project Document but not attached	S
Catalytic Role	No categorisation required	
Preparation and readiness	Prepared and ready for this project, mainly because of two previous projects on ozone-depleting substances, and due to legislation that had been put in place to control methyl bromide and other ozone-depleting substances	HS
Country commitment and motivation*	committed and motivated to the elimination of ozone-depleting substances, and the country was assessed as likely to continue with this commitment	HS
Stakeholder involvement	Multi-stakeholder approach that assigned responsibility to different services, administrations and ministries to undertake activities on monitoring and reporting of the use of methyl bromide; mill owners and strawberry runner growers involved through training and commercial activities	HS
Financial planning	Funds were reported by UNEP to be correctly managed and transparently accounted for in the project	S
UNEP supervision and support**	Appreciation for UNEP's assistance and guidance that had been given to countries during the course of in this project	S
Overall Rating		S

Highly Satisfactory (HS); Satisfactory (S); Moderately Satisfactory (MS); Moderately Unsatisfactory (MU); Unsatisfactory (U); Highly Unsatisfactory (HU);
*Motivation replaced TOR '*driveness*'; **Support replaced TOR 'backshopping'

10 Tajikistan

8.10.1 Background

2963. Tajikistan is a landlocked low-income country in Central Asia with a population of 7.3 million and a per capita income of $550[534]. Tajikistan continues to face difficult challenges arising from its geography, history, institutional weaknesses and the global economic crisis. Tajikistan suffered a civil war immediately after independence during 1992 to 1997, which inflicted widespread physical damage and loss of up to 50,000 lives. Peace and stability were achieved twelve years ago in 1997. The country experienced strong economic growth between 2000 and 2007, averaging about 9% per year. But for the last two years, Tajikistan's economic development was frustrated by deficiencies in macroeconomic management and severe winter energy shortages. Although the poverty rate declined recently, it still remains very high.

2964. Tajikistan ratified the Montreal Protocol and the London Amendment on 7 January 1998. In 1998, the total consumption of all ODS in Tajikistan was about 60 ODP-tonnes. At that time, the Refrigeration Sector consumption was 96.7% of all ODS consumption in Tajikistan. It covered the repair of domestic (38.7% of ODS consumption) and commercial and industrial refrigeration appliances (41.1%). Also at that time, there was a local manufacturer of domestic refrigerators. The industrial refrigeration applications use ammonia as the refrigerant. The use of halon and ODS in aerosols have been discontinued. The ODS consumption in Tajikistan decreased by about 82%, from about 213 ODP-tonnes in 1986 to 38 ODP-tonnes in 1996, due to structural changes in the country's economy.

2965. Tajikistan acceded to the Vienna Convention on 6 May 1996, the Montreal Protocol on 7 January 1998, and the London amendment on 7 January 1998. As a developed country that was formerly a part of the Soviet Union, Tajikistan was required to, *inter alia*, phase out the consumption of halon on 1 January 1994; and to phase out CFCs by 1 January 1996. The Ministry of Nature Resources Protection was the national coordinating body on issues related to the Montreal Protocol. The Ministry set up a special body for Ozone Depleting Substances (the Ozone Unit) that was in communication with the Cabinet of the President, State Committee on Industry, State Agency for Statistics, State Customs Committee, Department of Fire Fighting – Ministry of Internal Affairs, and other related Ministries, Committees and Institutions. The Ministry constituted a National Country Programme Team (NCPT) comprising of representatives of the various ministries, committees, institutions, etc., to support it in its efforts to facilitate ODS phase-out. The country programme for the phase-out of ODS was compiled in 1999 based on the exhaustive data survey of ODS consumption in various sectors, conducted by the NCPT.

2966. In October 2001, the thirteenth Meeting of Parties to the Montreal Protocol noted that Tajikistan was in non-compliance with its control obligations[535]. Tajikistan believed that this situation would continue through at least to 2004. In its country program, Tajikistan committed to reduce CFC consumption to 14.08 ODP-tonnes for the calendar year 2002, to 4.69 ODP tonnes for 2003 and to phase out CFC consumption by 1 January 2004. The Government committed to establish in 2002 a licensing system for ODS imports and exports, and to reduce methyl bromide consumption to 0.56 ODP-tonnes for 2002, to 0.28 ODP-tonnes for 2003, and to phase out methyl bromide consumption by 1 January 2005.

2967. The Parties in 2001 urged Tajikistan to work with the relevant implementing agencies to

---

[534] World Bank country profile.

[535] Decision XIII/20: Compliance with the Montreal Protocol by Tajikistan.

promote the adoption of alternatives to ODS. Tajikistan requested the GEF to assist it to achieve compliance with the provisions of the Montreal Protocol.

2968. With the assistance from the GEF, the Country Programme and the Refrigerant Management Plan were prepared in accordance with the guidelines of the Multilateral Fund. The project components reflected the strategies formulated in the Country Programme and the Refrigerant Management Plan.

2969. The GEF Council and the GEF GEO approved the Country Programme and the ODS Phase out Project for Tajikistan in December 1999 with the budget of $817,221. Additionally, it was anticipated that $194,956 would be contributed by enterprises and the Government. The main objective of this project was to assist Tajikistan in the rapid phase-out of ODS consistent with Decision XIII/20 of the Parties and, as a result, enhancing the credibility of the country in the international community. The project targeted priority ODS phase-out activities in the refrigeration sector that would enable the transition to non-ODS alternatives in this important sector before supplies of ODS were discontinued allowing the country to avoid the economic and social disruption. The project targeted eliminating the use of 24.11 ODP MT of ODS. The technology conversion under the project was intended for key industries to maintain domestic and export markets.

2970. The project was approved by GEF in December 1999 and started in December 2000 after the first disbursement by UNEP. The project was completed in December 2006. The GEF project comprised four sub-projects:

- GF/4040-00-23 – Institutional Strengthening and Capacity Building – Establishment of an Ozone Office (UNEP)
- GF/4040-02-03- Training of trainers for use of ODS-free refrigerants, including training of custom officers (UNEP);
- TAJ/00/G35- - National programme for recovery and recycling of ODS refrigerants (UNDP/UNOPS);
- TAJ/00G36 – Complete phase out of CFCs in manufacturing of domestic refrigerators at Pamir(UNDP/UNOPS);

2971. The estimated total cost of the project was US$ 1,183,677 which includes equipment, services, technical assistance, training, physical and price contingencies and net present value of incremental operating costs. The project was financed by a GEF grant of US$ 817,221 and contributions from the beneficiaries / Government amounting to US$ 194,956. The breakdown of the project cost is shown in Table 53.

Table 53: Sub-projects and associated costs

No	Sub-Projects	IA	GEF	Co-finance $	Total $
1	Elimination of CFC 12 in the Manufacture of Domestic Refrigerators at PAMIR	UNDP/UNOPS	171,072	173,956*	345,028
2	Refrigeration – Recovery & Recycling	UNDP/UNOPS	306,465	0	306,465
3	Technical assistance – Training of trainers	UNEP	122,673	45,000**	167,673
4	Technical assistance – Institutional Strengthening	UNEP	217,011	21,000**	238,011
TOTALS			**817,221**	**239,956**	**1,057,177**

*Government/Industry in-kind contribution that corresponds to the incremental operating costs for ½ year; ** In-kind contribution

2972. The design of the UNEP and UNDP projects did not require clearly defined logframes and prior agreed performance indicators (PIs) at the time of their formulation and approval. The 2004 Mid-Term Review identified the issue of absence of results-based management and accountability frameworks, including PIs in UNEP and UNDP sub-projects. Therefore, it has been necessary to retrospectively formulate some of project outputs and outcomes, and PIs based on results of mid-term evaluation, UNEP PIRs and what the project actually did on the ground.

8.10.2 GF/4040-00-23 – Institutional Strengthening and Capacity Building – Establishment of an Ozone Office (UNEP)

8.10.2.1 Objectives/Goals

2973. The overarching objective of this sub-project (GF/4040-00-23) was the strengthening of the national capacity to effectively coordinate and administer the actions outlined in the Country Program (CP) and the Refrigerant Management Plan (RMP). More specifically, the sub-project addressed the following needs: 1) to establish a NOU which would undertake and monitor the implementation of the CP and the RMP; 2) to facilitate in setting up a legal and regulatory system that meets the needs of compliance with MP obligations; 3) to enhance the ODS knowledge base in all sectors of civil society through the implementation of ODS awareness programme; 4) to support and encourage local industry and technical institutes in adopting ODS-free substitute technologies; 5) to coordinate implementation of ODS phase out activities according IA working plans and ODS phase out schedule established by the Parties to the MP; 6) to enable the collection of the required data on ODS use and consumption; 7) to enable the reporting to the Ozone Secretariat in accordance with Article 7 of the Montreal Protocol and to IAs. In the final analysis, the ultimate goal of the country ODS phase out programme and this sub-project was to eliminate the use of CFCs and to meet the requirements of the Montreal Protocol.

8.10.2.2 Effectiveness: Performance indicators

2974. In the absence of the logframe for the evaluation of the IS component, the performance indicators were inferred from the outputs/ deliverables contained in the project document and UNEP PIRs and assessed as commensurate real outcomes (Table 54).

Table 54: Tajikistan Objectives/ Intended Results - Outputs/Deliverables - Outcomes/Performance indicators

Objectives/Intended Results	Outputs/Deliverables	Outcomes/Performance indicators
1. Strengthening of the national capacity to effectively coordinate and administer the actions outlined in CP and RMP	1. Establishing NOU and initiating actions that created a suitable climate in the country for the expeditious phase-out 2 Political priority assigned by the Government to environmental issues and the MP in particular	1. Strengthened institutional capacity and improved coordination among stakeholders • Time required to UNEP to disburse the first funding tranche; • Timely recruitment of sufficient and qualified NOU staff; • Timely establishment of adequate infrastructure; • Provision of the counterpart funding; • Continuity of NOU staff and operation; • Ratification of MP Amendments; • Establishment of the Interagency Committee;

Objectives/Intended Results		Outcomes/Performance indicators
		• Approval of the Action Plan; • Access of NOU staff to decision makers;
2. The facilitation of legislative measures for the phase-out of ODS;	3 Development, promotion and adoption of legislative acts and regulations on control of ODS ;	2. Introduction of legal acts regulating ODS import-related issues and their enforcement • Adoption of legislation on ODS import/export licensing system in 2002 (Decision XIII/20); • Establishment of ODS import quota system; • Register of authorized importers; • Introduction of ban on trade of ODS and equipment containing ODS; • Adoption of qualification requirements in servicing; • Adoption of legislation that mandates 3R activities; • Measures on enforcement of legislation through training of customs officers; • Change of market price relations between CFCs and substitutes; •
3. The facilitation of increased coordination and monitoring of the CP and RMP	4. Effective interaction with governmental institutions and agencies; 5. Increased cooperation with business sector and professional associations; 6. Assistance in coordination and monitoring of implementation of investment and training sub-projects executed by IAs as part of RMPs;	• 3. Improved coordination and monitoring in implementation of the CP and RMP • Evidences of access of NOU to and interaction with decision makers; • Involvement of private sector stakeholders; • Establishment and support of the Refrigeration Association; • Successful completion of training of custom officers together with UNEP; • Successful completion of training of good servicing practices together with UNEP; • Successful completion of training of R/R operators together with UNDP; • Successful completion of conversion of “Pamir” plant to non-ODS technology;
4. The design and implementation of	• 7. Conducting awareness workshops for central and	• 4. Improved communication with and effective engagement

Objectives/Intended Results	Outputs/Deliverables	Outcomes/Performance indicators
ODS awareness programme	regional governmental officials, environmental inspectors and customs officers on ozone layer and MP issues • • 8. TV and radio interviews on ozone layer protection issues • • 9. Dissemination of booklets about ozone layer protection, and implementation of National ODS Phase out Programme;	of governmental and non-governmental institutions , professional organizations, private sector and general public in ODS phase out activities • • 5. Reduction of ODS consumption due to public awareness programme; • Number of workshops and degree of participation of institutions listed in Item 4. above in awareness programme and related ODS phase out activities; • Number of publications prepared and disseminated; • Degree of market penetration of ODS free products;
5. Support and encourage local industry and technical institutes in adopting ODS-free substitute technologies	10. Support in conversion of manufacturing domestic refrigeration appliances at "Pamir" 11. Coordination in provision of modern tools and equipment to servicing workshops in domestic, commercial refrigeration and A/C sector;	• 6. Adoption ODS-free substitute technologies by "Pamir" 7. Adoption of good servicing practices and availability of modern tools in the refrigeration sector, including recovery and recycling • ODP tonnes phased out at "Pamir"; • Number of servicing kits provided to servicing enterprises;
6. Facilitate / enable the collection of the required data on ODS use and consumption, establish the line of information exchange in the country and reporting to the Ozone Secretariat and IAs.	12. Collection, analysis and exchange of MP related information in the country and the region; 13. Preparation annual reports on ODS consumption and NOU activities to the Ozone Secretariat (OS); 13. Preparation and submission of necessary information and reports to the implementing agencies; 14. Exchange of experience between the NOU and other	8. Establishment the line of communication with the Customs, SCS, and licensed importers to collect ODS import data; 9. Establishment the line of communication with NOUs in border countries; • Creation of ODS database; • Availability of MP related information on the OS website; • Reports of the Implementation Committee; • Participation in Central Asia and Eastern Europe Networking; • Assessments of the NOU reporting quality by IAs;

Objectives/Intended Results	Outputs/Deliverables	Outcomes/Performance indicators
	Network members to combat illegal trade in ODS, including sub-regional cooperation;	
7. Facilitate the Government of Tajikistan to reduce and phase out consumption of controlled ODS by 2004.	15. Coordination of the implementation of the National ODS Phase out Programme;	10. Compliance with ODS phase out schedule established in Para 2(a) and 3, Decision XII/20 of the Parties; 12 Compliance with methyl bromide reduction schedule established in Para 2(d), Decision XII/20 of the Parties;

8.10.2.3 Attainment of objectives and planned results: Effectiveness

2975. The assessment of achieved results and their effectiveness involve the analysis of how the intended results as formulated in the sub-project were achieved and inputs have been translated into outputs and long term outcomes, and impact. The effectiveness, relevance and efficiency were used as qualifiers in measuring the success or failure as appropriate.

8.10.2.3.1 Establishment of the Ozone Office

2976. The IS project provided resources to the Ministry of Nature Resources Protection for strengthening the national institutional structure and monitoring the ODS phase-out activities for a period of three years. UNEP approved the IS project in October 2000 and disbursed the first tranche through the UNDP local office in December 2000. The first disbursement took place after twelve months from the time of Project approval by GEF. This support included computing and communications equipment, operating costs including telecommunications and office supplies, staff support for a national project coordinator and NOU personnel, funding for essential public awareness and project support services.

2977. The National Ozone Unit (NOU) was established in the MNRP as non-profit organization in January 2001. It was staffed by four employees, including the former Deputy Minister of MNRP as the head of NOU. The head of NOU continued to discharge his responsibilities as Deputy Minister. The activities of the NOU had a well-defined place in the national administration and access to the key decision-makers, including enforcement agencies. The GEF support of the NOU was originally scheduled for 3 years until the end of 2003.

2978. The Government of Tajikistan attached a great importance to national obligations associated with the Montreal Protocol. The Interagency Committee (IC) was established in Tajikistan for the implementation of the National ODS Phase out Programme (Country Programme (CP)) adopted by the Government Decree[536] in December 2002. The representatives of the State Committee of Environment and Forestry (SCEF), Ministry of Economy and Trade, Ministry of Revenue, Ministry of Foreign Affairs, Ministry of Finance, State Committee on Statistics and others were assigned as members of this Committee. The Head of the NOU (the First Deputy of the Chairman of SCEF) was appointed as a Coordinator of IC.

2979. A three year ODS phase out action plan was agreed with IC and adopted by the SCEF. The Action Plan was directly related to the Institutional Strengthening Project work schedule and closely coordinated with training, recovery and recycling, and investment components. The Committee on the Environment Protection of the Cabinet of Ministers monitored the implementation of the National Programme on Ozone Protection. The implementation of its Action Plan was part of two important National Plans: the Plan of the National Development of the Republic of Tajikistan until 2015, and the Plan of the Poverty Alleviation. The implementation of requirements of the

[536] Decree of the Government of Tajikistan No 477 of 3 December 2002

Montreal Protocol was also one of indicators determining the ecological sustainability in the country.

2980. Within this management context, the NOU received a clear and comprehensive mandate to coordinate the Government's activities to meet its commitments under the MP. The existing set up provided the NOU staff the necessary access to decision makers and enforcement agencies. The NOU launched the process of ratification of Copenhagen, Montreal and Beijing amendments to the Montreal Protocol. The process took a number of years to be completed. The parliament ratified all the three amendments in May 2009.

2981. The appointment of a high ranking official with many years of experience in environment science and management as the head of the National Ozone Unit provided conditions for a good start. The deputy of the head of the NOU is a refrigeration engineer with years of practical experience in servicing domestic and commercial refrigeration equipment and A/C systems. The Refrigerant Management Plan (RMP) was an important part of the CP since the bulk of ODS consumption was in the refrigeration servicing sector. The presence of a refrigeration expert in the NOU staff greatly facilitated the implementation of the RMP.

2982. The NOU prepared and approved the working plans for 2002, 2003 and 2004. However, due to the delays in financing, some activities were rescheduled. These delays were caused by UNDP/UNEP's complex reporting and accounting requirements, that the NOU was not trained to meet. Despite these difficulties, reports on a limited number of implemented activities were submitted to UNEP.

2983. The IS sub-project was not completed as planned. The financial support to the NOU was extended for another two years in 2004 and 2005, with finance from original funds. This support included provision of operating costs including telecommunications and office supplies, staff support for a national project coordinator, funding the awareness raising, and project support services. The IS sub-project was financially closed in December 2006. The delay in completion of planned project activities had no adverse impact on Tajikistan commitments to phase out CFCs in accordance with Decision XIII/20: Compliance with the Montreal Protocol by Tajikistan. Tajikistan's objective to phase out its 1999 consumption of 50.7 ODP-tonnes of ODS was fully met by I January 2004. The extension of the IS sub-project in 2004 and 2005 facilitated, however, the continuity of the NOU until the funding of the NOU was resumed in 2009 under the extension of GEF support to ODS phase out activities.

2984. One of the important outcomes of the IS project was attained. The fully functioning and effective NOU was established and continued its operations even beyond the date of financial closure of the IS sub-project.

8.10.2.3.2 Adoption of legislative acts and regulations on control of ODS and its enforcement

2985. The NOU was actively involved in preparing legislative drafts and promoting their approval. In 3 December 2002, the Decree 477 of the Cabinet of Ministers was adopted on measures for the implementation of Vienna Convention on ozone layer protection and Montreal Protocol on ozone depleting substances. This Decree provided , the following important actions:

- Approved the National ODS Phase out Programme;
- Endorsed provisions regulating imports of ODS and licensing of activities related to the use of bulk ODS and equipment containing ODS;
- Established ODS imports quotas for the period 2003 to 2005;
- Endorsed the Ministry of Nature Protection as responsible agency for issuing one time permissions for ODS imports.
- In December 2005, the Cabinet of Ministers approved an amendment[537] to the Decree 477 and introduced the ban on production, imports and re-export of CFCs and Halon.
- In 2006, existing legislation on licensing was amended to require activities related to the purchase, sale, use and destruction of ODS and ODS-containing products to be licensed, as well as activities related to the installation, maintenance and repair of

[537] Decree No 517 of 30 December 2005. The list of products was established in the annex to the decree.

equipment containing ODS[538];

- In 2007, additional legislation on licensing was approved including revised directives on the licensing of ODS-related activities and activities related to the installation, maintenance and repair of equipment containing ODS[539].
- The NOU has enforced adopted legislation by developing " Instruction on regulation of ODS and imports of ODS containing products" and "Instruction for individuals and legal entities engaged in service of refrigeration equipment and import into the Republic of Tajikistan of ODS and ODS containing products". The NOU in co-operation with the Customs developed the format for application for one time permission designed for ODS importers and the format of one time permission issued by the Ministry of Nature Protection.
- Under the Ministry of Nature Protection, the Commission was established for registration of ODS importers and eligible refrigeration service activities, and licensing ODS imports.

2986. The adopted legislation acts have been enforced through training of custom officers and regional and local ecological inspectors. The change of market prices of CFC-12 refrigerant and its substitute HFC-134a was indicative of a positive impact of enforcement of the adopted legislative measures (Table 55). The price of CFC-12 reached its maximum in 2005 representing increase of about 140% against 2001. The increase in price was driven by the ban on CFC imports introduced in 2004.

Table 55: The market price of CFC-12 and HFC-134a in Tajikistan (US$)

Refrigerant	Years								
	2001	2002	2003	2004	2005	2006	2007	2008	2009
CFC-12	6.85	7.25	7.80	8.54	16.35	14.54	10.38	11.11	10.10
HFC-134a			12.80	12.45	11.72	9.67	7.80	8.97	7.87

2987. The head of the NOU was active in promoting ratification of Copenhagen, Montreal and Beijing amendments to the Montreal Protocol and participating in key hearing sessions in the Parliament of Tajikistan.

2988. The conclusion is that the needed legislative measures were developed, promoted, adopted and enforced in Tajikistan with the pivotal role of the NOU. The position of the NOU in the Governmental structure and its access to decision makers were crucial factors that facilitated promotion and adoption of the ozone related legislation.

8.10.2.3.3 The NOU role in co-ordination and monitoring of ODS phase out activities

2989. The implementation of the ODS phase out programme required the NOU coordination on three levels: a) among governmental institutions; b) among implementing agencies; and c) among national commercial enterprises. The ground for close relationship with governmental institutions was laid in 1998 when the head of the NOU, then the Deputy Minister of Environment, was appointed by the Presidential Decree as a coordinator of the Inter-ministerial Working Group on development of the National Program on Protection of the Ozone Layer. High ranking officials from the legal department of the Cabinet of Ministers, the State Committee on Industry, State Customs Committee, State Agency on Statistics, the State Ecological Inspectorate and others were members of the Working Group and worked together on issues related to the Vienna Convention and the Montreal Protocol. Once the GEF project was approved, the established contacts facilitated co-ordination of the implementation of specific ODS phase out activities by the NOU. Among others, these activities include:

1) The development and promotion of legislation in the Cabinet of Ministers and the Parliament. Information presented in the relevant section shows that adoption of ODS

[538] Decree No 327 of 30 June 2006. Law of Republic Tajikistan on the Licensing of Specific Activities.
[539] Decree No 172 of 3 April 2007. New version of directives on the Licensing of Specific Activities.

regulations could not have been achieved without the proper co-ordinating role of the NOU.

2) The NOU closely co-ordinated with the State Customs Committee (SCC) activities on enforcement of ODS imports control, training of custom officers, provision and distribution of refrigerant identifiers, and customs clearance of equipment delivered by IA under several sub-projects. All these activities have been successfully completed. The scope of these activities and achievements will be further discussed in the following sections.
3) The NOU interacted successfully with the State Committee on Statistics (SCS) and SCC on collection of national ODS consumption data. The information provided by SCS and SCC enabled the NOU timely reporting data to the Ozone Secretariat.
4) The NOU worked closely together with the Ecological Inspectorate and its regional branches on enforcement of the legislation on licensing activities related to the use of ODS and installation, maintenance and repair of ODS containing equipment. The refrigeration servicing shops visited by the evaluation team confirmed the involvement of the Inspectorate in regular monitoring activities.

2990. The NOU played an important role in coordination of the implementation of the Refrigerant Management Plan (RMP). The RMP in Tajikistan was developed as a strategic tool to enable the reduction and subsequent phase out of ODS consumption in the refrigeration sector in a coordinated, planned and cost-effective way. The major elements of the RMP included appropriate and adequate training of servicing technicians in the environmentally-safe handling of refrigerants, retrofitting of existing refrigeration equipment to use non-ODS alternatives, and the recovery and recycling of ODS refrigerants. The RMP was accompanied by a policy framework consisting of regulations of ODS imports, certification of servicing personnel and introduction of a system of economic incentives/disincentives. The implementation of the RMP required optimal time sequencing and close co-ordination in execution of training components by UNEP and investment components by UNDP, and adoption of appropriate policy framework by the Government.

2991. The Government, with assistance from the NOU, managed to adopt the legislation on licensing and quota system to control imports of ODS within 22 months starting from the date of the NOU set up. This legislation effectively enabled the implementing agencies to start activities on training of custom officers and refrigeration technicians within the time schedule determined in the RMP. The introduction of the ban on ODS imports resulted in the shortage of supply of CFC-12 refrigerant stimulating recovery and recycling operations.

2992. The NOU established good working relations with two major refrigeration servicing companies that dealt with the commercial and domestic sectors respectively. The active involvement of these two companies was extremely important for successful implementation of training of refrigeration technicians and establishment of a network of refrigerant recovery and recycling operations. The NOU facilitated creation of the Refrigeration Association (RA) which assisted in the implementation and monitoring of the RMP, and collection of data on recovery and recycling. Currently, the Refrigeration Association continues its activities with membership of 744 persons.

2993. In conclusion, the NOU played the pivotal role in coordination of the implementation of the National Country Programme and RMP. The role of the NOU in coordination of UNEP and UNDP interaction, however, was limited. The coordination of timely allocation and disbursement of GEF resources, procurement and delivery of equipment by implementing agencies was beyond the control of the NOU. The level of co-ordination between the implementing agencies will be discussed in following sections.

8.10.2.3.4 The public awareness programme

2994. The objective of the awareness campaigns was to disseminate information on the ODS phase out, the existence of ODS-free technologies and the need to control consumption and movement of ODS in the country for the general public and local industry, the Customs and the

Inspectorate, and other Governmental institutions.

2995. The NOU realized the importance of raising the public awareness about the ozone depletion problem and its relationship with the Government strategy on the implementation of the National Programme on ODS phase out. Altogether, 22 booklets in relation to the implementation of the National Programme were published and disseminated among Regional Offices of the MEP for further distribution locally. There are several examples of these booklets: "*Problems with the depletion of the ozone layer*", "*Status of the ozone layer*", "*Main facts, scientific data and policies related to the ozone layer protection*", "*Montreal and Kyoto Protocols: Two Protocols – One World*", "*Reduction of ozone layer depletion and global warming*", "*Measures undertaken by Republic of Tajikistan on the ozone layer protection*", "*Projects on ozone layer protection, implemented in Republic of Tajikistan*", "*Recovery and recycling of refrigerants in Tajikistan*", "*Problems of transition to alternative refrigerants*", "*New refrigerants: pluses and minuses*", "*What is the ozone hole*", and others. During the period from October 2000 until October 2005 eight seminars on ozone layer protection were conducted for regional inspectors and Governmental official in four regions. The State TV and radio stations covered regularly ozone related workshops and other events.

2996. The public awareness and media coverage were the factors that facilitated promotion of ozone related legislation in the Parliament. The improved awareness of regional inspectors facilitated the closer and more effective co-operation with customs officers and resulted in prevention of illegal ODS trade. The wide dissemination of information about ozone depleting issues contributed to expanded penetration of ODS-free equipment and its acceptance by the general public. In general, the expected outcomes of the public awareness component have been achieved.

2997. As in many other CEITs, Tajikistan had undertaken activities on awareness raising to shore up support from the public, government and business stakeholders for legislation and activities that would restrict and eventually phase out ODS. As in other countries UNEP project design did not include, a baseline and performance indicators to measure the benefits of ODS reduction. These could have been, for example, before and after data on the number of ODS-free refrigerators bought by the general public, an increase in ODS refrigerators being sent for recycling, demand for information on the website (as number of hits) on ODS-free alternatives. It was therefore impossible to evaluate the impact of the awareness programme.

8.10.2.3.5 The role of the NOU in promoting and adopting ODS-free substitute technologies by the industry and technical institutions

2998. The domestic refrigerator manufacturer "Pamir" was included in the National Country Programme as a priority enterprise to be converted to non-ODS technology. The UNDP sub-project financed the replacement of 8.61 ODP-tonnes per year of CFC-12 with HFC-134a refrigerant. The conversion of "Pamir" was accomplished in June 2001. With bilateral assistance, "Pamir" later installed an additional production line based on iso-butane without further GEF assistance, so that "Pamir" had an option to implement hydrocarbon technology while the user demand would be increasing. The head of the NOU signed the Certificate of Completion of all conversion works in December 2002 together with UNDP expert and the Director of "Pamir". The NOU in co-operation with the State Committee on Industry and the management of "Pamir" tried trough UNDP to get additional GEF financing to replace the CFC-based foam insulation technology with new hydrocarbon-based equipment. These attempts did not materialise in the absence of solid CFC-11 baseline consumption.

2999. The NOU was actively involved in the implementation of the conversion of the plant. The NOU assisted in interaction of the enterprise with UNOPS, UNDP and the bi-lateral donor, their international experts and suppliers of equipment and materials. The NOU established contacts with the Government of Switzerland as a bi-lateral donor financing "Pamir" conversion to iso-butane and Transfair GmbH (Germany) that implemented installation of iso-butane production line. The NOU interacted with the State Customs Committee enabling timely and tax-free delivery of production equipment. Unfortunately, the annual production of HFC-134a based product did not exceed 2,250 units that denoted only about 1.3% of its installed capacity. "Pamir" products could not compete with imported refrigerators available at the market in Tajikistan because of high energy consumption and outdated design. The production stopped in

2006 and the enterprise went bankrupt. More detailed information regarding "Pamir" conversion is provided in the section dedicated to the UNDP/UNOPS sub-project.

3000. The coordination efforts of the NOU brought much more positive results in promoting the new technology in the refrigeration end-user and servicing sector. The introduction of legislation on banning imports of bulk ODS and ODS containing equipment, and intensive public awareness campaign created conditions for steady market penetration of domestic and commercial refrigeration equipment, and A/C systems based on non-ODS alternatives such as HFC-134a, R-404A, R-410A, R-407C and others. The total population of CFC-based domestic refrigerators was estimated to be about one million units in 1999-2000 in Tajikistan. Currently, about 85% of them have been replaced with HFC-134a- and iso-butane-based appliances. The life time of domestic appliances is more than 20 years in countries like Tajikistan. It is expected that CFC-12 refrigerant will still be in demand in the near future sourced mainly from recovery and recycling operations. In commercial refrigeration sector, the replacement of old equipment with new non-ODS alternatives has been more far-reaching because of shorter life time of equipment. The structural changes in commercial and retailing business also accelerated the faster change over.

3001. Through the implementation of the recovery and recycling project, servicing shops were provided with modern and more efficient servicing equipment such as electronic leak detectors, refrigerant analysers, braising equipment, digital thermometers and scales, vacuum pumps and manual tools. This equipment and training subsequently received enabled servicing technicians to apply good servicing practices improving quality of repair and reducing leaks and emission of CFC refrigerants to the atmosphere. Additionally, servicing workshops were provided with refrigerant recovery and recycling equipment that prevented venting the refrigerant during repair operations. Altogether, 117 sets of servicing and recovery and recycling equipment were provided to the network of servicing companies in the country. The NOU co-ordinated the distribution of equipment using the quantity of ODS refrigerant consumed by each servicing outlet as an indicator. More detailed information is provided in following sections in discussing the recovery and recycling sub-project.

3002. In conclusion, the NOU played an important role in adoption and promotion of new non-ODS based technology and equipment in the manufacturing, end-user and servicing sectors.

8.10.2.3.6 The role of the NOU in collection of ODS related data and information exchange with other parties

3003. The collection of ODS consumption data and reporting this data to national supervisory bodies and the Ozone Secretariat is the important task included in the terms of responsibilities of the NOU. The data officially reported under Article 7 of the Montreal Protocol to the Ozone Secretariat serve as a basis for determination of the compliance of the country with the Montreal Protocol phase-out schedule.

3004. There are three sources of information on imports of ODS in the country. The first source is one time permissions on imports of ODS issued by the Ministry of Environment Protection. The second source is customs declarations which register actual quantities imported to the country. The central customs office collects reports from their check points quarterly and sends its annual reports to the MEP and NOU. Additionally, the NOU received ODS consumption data from State Committee on Statistics (SCS). It is mandatory for importers of ODS and ODS containing equipment to report their business related information to SCS, including data on quantities of imported ODS. The NOU compares and validates these three streams of data and prepares the consolidated report to the Ozone Secretariat on the annual basis.

3005. The Implementation Committee of the Parties of the Montreal Protocol monitors the reporting of Article 7 data by countries and brings cases of non-compliance in data reporting to the Parties. The Thirteenth Meeting of the Implementation Committee in July 2003 observed in its report that Tajikistan did not provide data on the progress in the implementation of the agreed benchmarks and recommended the Ozone Secretariat to send the reminder to the country.

3006. In its early stage, the NOU experienced problems in communication with UNEP DTIE in Paris. These problems originated from the lack of initiation process as such after establishing the NOU. In particular, no training was provided on reporting and accounting requirements. The difficulties in communication occurred also due to frequent changes of backstopping officers in

Paris office. The Russian speaking staff was not always available. The head of NOU visited Paris Office in January 2004 and a log frame of activities until December 2004 was elaborated. In 2004, the supervisory role was taken away from UNEP DTIE and the UNEP GEF task manger and the Financial Management Officer were assigned to supervise IS sub-projects funded by GEF in CEITs. In April 2004, UNEP GEF organized Workshop on Management and Enhancement of Reporting Procedures of GEF-funded Ozone Projects. NOU officers from Tajikistan, Turkmenistan and Uzbekistan were brought to Paris and many outstanding issues were resolved. Since then, the NOU regularly reported data to UNEP GEF office.

8.10.2.3.7 The role of the NOU in facilitating the phase out CFCs, halons and Methyl Bromide

3007. By the time of formulation of its Country Programme, Tajikistan did not use halons in existing fire fighting systems. Tajikistan's objective to phase out its 1999 consumption of 50.7 ODP-tonnes of ODS was fully met by 1 January 2004, largely as a result of the GEF financial assistance. Tajikistan returned to compliance with the requirements of the Montreal Protocol, in accordance with Decision XIII/20 of the Parties.

3008. In agreement with Tajikistan's commitment in Decision XIII/20, Tajikistan successfully ended the use of methyl bromide for soil fumigation in 1999. In 2006, consumption of methyl bromide for quarantine and pre-shipment, which is a permitted use under the Montreal Protocol, was 3.84 ODP-tonnes mainly for cotton and grain exports to Iran. The Sections below demonstrate the important role of the NOU in facilitating the phase out of CFC and halons in the country.

8.10.2.3.8 Relevance

3009. The inputs and outputs have been transformed into specific and tangible outcomes. The outcomes of the project are fully in agreement with the Government strategy and priorities outlined in the country programme.

3010. Although the GEF is not linked formally to the Montreal Protocol, its strategy in the Ozone Layer Depletion Focal Area is an operational response to the Montreal Protocol and its Adjustment and Amendments. The strategic objective of the Focal Area is to protect human health and the environment by assisting countries in phasing out the consumption and production, and in preventing releases, of ODS while enabling alternative technologies and practices according to countries' commitments under the Montreal Protocol. The expected long-term impact of the GEF interventions is to contribute to the return of the ozone layer to pre-1980 ozone levels, which is expected by 2065.

3011. The GEF developed a focal area operational strategy to address ODS in 1995 with the goal "to contribute to measures that protect human health and the environment against adverse effects resulting, or likely to result from, human activities that modify or are likely to modify the ozone layer"

3012. The link between ozone depleting chemicals and climate change has also increased dramatically in recent years with the recognition that many of ODS also have significant global warming potential (GWP)[540] many hundreds to thousands of times greater than carbon dioxide. The GEF portfolio of ODS phase out project in CEITs and in Tajikistan, in particular, contributed to avoided GHG emissions. The project outcomes are, therefore, consistent with contributed to the objectives of GEF Ozone Layer Depletion and Climate Change Focal Areas and respective operating strategies.

8.10.2.3.9 Efficiency

3013. The GEF support of the NOU through the institutional strengthening project was originally scheduled for 3 years (2001 – 2003) providing $217,011. The Government of Tajikistan co-financed the project with $21,000 in-kind contribution. It is problematic to assess the cost-effectiveness of the IS project in terms of US$/kg ODP. However, from analysis of outcomes versus inputs, one can conclude that the project was very cost-effective. The financial support to the NOU was extended for another three years (2004 - 2006), with finance from the original funds since not all the planned activities were completed. This extension did not affect

[540] Global warming potential is a measure of how much a given mass of greenhouse gas is estimated to contribute to global warming. It is a relative scale which compares a gas in question to that of the same mass of CO2 (whose GWP is 1).

negatively the compliance with ODS phase out requirements. The CFC and halons consumption was completely phased out in 2004. The objectives of project could have been met faster had the UNEP overall and financial management would be more efficient. Once the GEF financing was exhausted, the support of the NOU from the Government was critical to maintain the sustainability of the results achieved. The GEF financing of the NOU was resumed only in 2009 under the IS extension project approved by the GEF Council in 2007.

8.10.2.4 Assessment of Sustainability of project outcomes

8.10.2.4.1 Financial resources

3014. Since its inception in 2001, the NOU was staffed with 4 staff members and 3 consultants. In 2006, the GEF funding was stopped. The workforce of the NOU funded by the project was reduced to two staff members (the head and translator). The Government established and maintained a position in the Hydrometeorological Service for the head of the NOU in anticipation of the extension of the IS project. The scope of activities of the NOU has been substantially reduced. The continuation of the NOU operation was possible thanks to the support received from the Refrigeration Association and private sector. The GEF funding resumed in March 2009. The IS extension project approved by the GEF Council has included cash co-finance of approximately US$ 17,000 from the Government. The further delay in receiving the assistance posed a risk of losing out the momentum.

8.10.2.4.2 Socio-political and institutional framework and governance

3015. Socio-political sustainability is directly related to the level of Government commitment adopting legislation to restrict import and export of ODS and equipment containing ODS, and ensure training of technicians in the refrigeration sector and custom officers. More important for sustainability of the achieved results are the enforcement of adopted legislation and further legislative work after the Project was completed, such as mandatory recovery and recycling of ODS, introduction of qualification requirements for refrigeration servicing personnel and the continuing monitoring and reporting of recovered and recycled ODS. The NOU facilitated adoption of the above legislative and policy changes in Tajikistan. The Refrigeration Association has also played an important role in enforcement of adopted legislation in the servicing sector. These measures played a critical role in providing relevant signals to the private sector and individual consumers to move into more environmentally friendly alternative chemicals and technologies creating conditions for the sustainability of project outcomes.

8.10.2.4.3 Environmental

3016. The risk of illegal trade still remains because of the continuous demand for CFC-12 for servicing old refrigeration equipment. The state of the economy is not favorable to stimulate the early replacement of existing CFC-12-based equipment.

3017. The recovered quantity of CFC-12 in recent years shows that the demand remains steady at about 11 ODP tonnes and even growing. The NOU, the State Customs Committee and the Inspectorate in the MNRP should continue to remain vigilant.

8.10.2.5 Achievement of outputs and activities

3018. The achievement of outputs and activities is analysed in the section Attainment of objectives and planned results: Effectiveness. All the fifteen outputs were achieved. The implemented outputs and activities created a solid base for attaining objectives and meeting planned outcomes.

8.10.2.6 Catalytic role

3019. The catalytic role of the IS project can be traced through results of awareness raising component that encouraged positive approach toward activities related to the protection of the ozone layer. The wide dissemination of information about the threats to the ozone layer contributed in promoting ODS free equipment and its acceptance by the general public. The IS project had a strong influence on the attitude of companies and servicing technicians in the refrigeration and air-conditioning sector. They now apply good practices in servicing the refrigeration equipment and will transmit this knowledge to new generation of servicing personnel.

8.10.2.7 Assessment of Monitoring and Evaluation Systems

8.10.2.7.1 M&E design

3020. The evaluators had limited capabilities in investigating the monitoring and evaluation systems applied in the course of the implementation of the IS project. On UNEP side, the project was managed by DTIE office in Paris until early 2003 when GEF Task Manager and Finance Management Officer in Nairobi took over the operational control. The GEF Task Manager was transferred to Washington DC in 2007. Originally, the evaluation team was scheduled to visit DTIE Headquarters in Paris to get acquainted with the project documentation, including progress reports and to be briefed by UNEP DTIE staff members involved in management of the GEF portfolio in CEITs. However, this visit did not materialise. Later, the head of DTIE Ozone Action Branch in Paris office advised the evaluation team that all the archived documents related to GEF ozone portfolio in CEITs were discarded. The evaluation team had a short briefing session with the GEF Task Manager (TM) in Geneva during the 29th Meeting of OEWG in July 2009. The evaluation team was provided with annual Project Implementation Reports (PIR) presented to the GEF Secretariat by the GEF Task Manager. The assessment of monitoring and evaluation system is based on the analysis of PIRs, mid-term evaluation report and interviews of the NOU.

3021. The mid-term evaluators had the opportunity working with UNEP DTIE staff and relevant documentation in Paris in 2004. The mid-term evaluation report (MTER) identified shortcomings of the M&E system design, in particular, the report called to review and determine the adequacy of Performance Indicators (PIs) where they exist and assign PIs where they did not exist. The Report recognized also the lack of result-based management and accountability framework.[541]

3022. The Project Implementation Reports (PIR) prepared by the GEF TM indicated to similar problems. The design of the Ozone portfolio of CEIT ODS capacity building and institutional strengthening projects was not reflective of state-of-the-art project management practices. Nor, do they address accountability in an adequate manner, especially country accountability for sustaining results achieved. Many of the PIs that do exist in documents are either out of date, or irrelevant to the project implementation status. With poor design and performance indicators, it meant that even with proper reporting under a standard M&E Plan there was a quantitative aspect to reporting under the project, but it was difficult to track the quality of the outputs, and ultimately their sustainability. Risk analysis was also not a part of project design, and this further compounded the ability of both execution and implementing agencies to predict long term/post project problems as all activities appeared well executed and timely.[542] The evaluation team is in agreement with conclusions in regard to M&E design contained in the mid-term evaluation report and UNEP GEF PIRs.

3023. The 2006 PIR prepared by GEF TM contains the necessary monitoring tools such as assessment and rating of progress in regard to project outputs, internal and external risk identification and rating and description of project implementation monitoring, experience and lessons.

3024. The implementation of IS activities was also monitored through the country internal mechanisms.

8.10.2.7.2 M&E plan implementation

3025. The Committee on the Environment Protection of the Cabinet of Ministers and the Ministry of Environment Protection (MEP) monitored the implementation of the National Programme on Ozone Protection. The implementation of its Action Plan was part of two important national plans: the Plan of the National Development of the Republic of Tajikistan until 2015, and the Plan of the Poverty Alleviation. The implementation of requirements of the Montreal Protocol was one of indicators determining the ecological sustainability in the country, so this indicator had a very high profile politically.

3026. All activities of the NOU were accomplished in accordance with the work plan and monitored by

---

[541] Mid-term evaluation report 4 July 2004, Victor Buxton and Risto Ciconkov

[542] UNEP GEF PIR FY 06 (1 July 2005 to 30 June 2006)

the NOU and in close coordination with the MEP. The head of the NOU supervised consultants working on the project. The consultants prepared quarterly, or when necessary, reports on the work and provided the necessary supporting documents. Regional Committees for Environment Protection interacted with the NOU directly and assisted in monitoring of data on ODS consumption.

3027. The NOU prepared and submitted quarterly, half-yearly and annual progress reports to UNEP DTIE and later to UNEP GEF TM and FMO according to the project document reflecting outputs/activities, data on reduction of ODS consumption, providing reports on expenditures incurred, future action plans and cash advance requests. Monitoring and reporting on the project activities have been carried out by and large in a timely and efficient manner. These progress reports were the primary source of information included in the annual UNEP GEF Project Implementation Reports presented to the GEF Secretariat.

3028. The project monitoring and supervision by UNEP DTIE and later by the GEF TM include implementation of the SMART system as defined in Annex 4 of the Terms of Reference for the terminal evaluation (see Annex 1: Terms of Reference in this report). The major outcome of the project i.e. the ODS phase out was monitored against the baseline through the cross-checking Article 7 data reported to the Ozone Secretariat. The routine monitoring of progress was primarily based on the review of quarterly and semi-annual reports submitted by the NOU to UNEP DTIE and later to the GEF TM and FMO and well reflected in annual UNEP GEF PIRs.

3029. In the course of the project, the NOU prepared and submitted for approval by UNEP annual work plans with good consistency. However, due to delays in the earlier stage of the project not all kind of activities were implemented in a timely fashion. Usually these delays occurred due to an early lack of dedicated staff in UNEP, and associated delays in processing of expenditure reports and cash advances. UNEP DTIE and DGEF conducted a workshop on management of GEF-funded ozone projects to enhance reporting procedures and address outstanding operational and financial issues in April 2004. No UNEP staff field validation missions were undertaken.

3030. The mid-term evaluation was conducted in March 2004 and the terminal evaluation was carried out in March 2009.

8.10.2.7.3 Budgeting and Funding for M&E activities

3031. The internal monitoring of ODS phase out activities by the NOU staff and local consultants was covered from the budget of the IS project. The monitoring functions were part of working responsibilities of UNEP DTIE and DGEF staff. The evaluation team had no access to financial documents since the focus of the evaluation was on outcomes and impact of the project.

8.10.2.7.4 Long-term Monitoring

3032. The Government continues fulfilling requirements of the Montreal Protocol. The NOU maintains monitoring, collection and reporting of ODS consumption data to the Ozone Secretariat in accordance with Article 7 of the Montreal Protocol and its amendments, and relevant decisions of the Parties. Countries not submitting data or submitting inconsistent data are requested by the Ozone Secretariat to comply with the data reporting requirements. Such cases can also be put on the agenda of the Implementation Committee of the Montreal Protocol, which may ask Parties concerned for explanations and could recommend suitable action to the Meeting of the Parties. Thus in 2003, shortcomings in Article 7 data reporting by Tajikistan were recognized by the Implementation Committee. The letter was sent to Tajikistan reminding of its benchmark commitments and requesting to report on progress made to achieve them. The NOU responded promptly to the request. Since then, Tajikistan has a good record of reporting its Article 7 data. The NOU was also regularly reporting to UNEP GEF TM and FMO on the implementation of the IS project. The regular reporting of data ensures the sustainability of the outcomes of the project.

8.10.2.8 Assessment of processes that affected attainment of project results

8.10.2.8.1 Preparation and readiness

3033. The GEF intervention in CEITs addressing the ODS phase out issues was based in great extent on the experience gained by the Multilateral Fund and its implementing agencies (UNEP, UNDP, World Bank, UNIDO) in Article 5 countries. The GEF intervention in Tajikistan followed the

strategy that proved to be successful in many Article 5 countries i.e. as a first step, preparation the country programme with direct involvement of the Government and other stakeholders concerned and the Refrigerant Management Plant. The preparation of these strategic documents contributed greatly into the development and design of the package of the GEF ODS phase out projects in Tajikistan, including the Institutional Strengthening project. The institutional strengthening and capacity building activities in combination with awareness programme, training components and recovery and recycling of controlled ODS refrigerants, and investment project in the refrigeration manufacturing industry were distinctive in many ODS phase out programmes implemented in Article 5 countries. UNEP and UNDP were very much familiar with challenges in implementing such programmes.

3034. The Government managed to designate a competent staff in a relatively short period of time. However, the first period of initiation of the newly formed NOU in Tajikistan proved to be difficult when the NOU staff experienced a steep learning curve trying to adopt new reporting requirements and financial procedures of two international organisations. The problems were exacerbated by the frequent changes in supervisory staff in UNEP DTIE and the language barrier. It should be mentioned that similar problems have been successfully addressed by the Multilateral Fund through the networking of ozone officers. The GEF approach did not envisage establishment of such institutions. Instead, the GEF organised the regional compliance project for 21 countries. Regrettably, Tajikistan and other Central Asia NOUs could not fully benefit from early workshops due to lack of communication in Russian. Nevertheless, the competent and responsible NOU staff managed to establish good working relationships with all major stakeholders and outreach general public and industry groups through effective awareness campaign.

3035. As pointed out in the M&E Design section, the IS project being developed some time ago does not contain well developed performance indicators, nor setting specific time frame, milestones, sequencing and dependency of planned activities, and assigning responsibility. The availability of logframes was not mandatory in early design of IS projects. The necessary corrections in design have been done in development of recently approved extension of the IS project. Nonetheless, apart from the monitoring by the implementing agency, the implementation of the project has been supervised by the Government as part of the Country Programme and by the Implementation Committee. The outputs set out in the original IS document have been met. The project design, however, has not comply with the dynamic nature of the Montreal Protocol and the expansion of its control measures required adequate adjustment in the NOU set up.

8.10.2.8.2 Country commitment

3036. Government commitment is an important driver to ensure progression from inputs to outcomes and impacts. Several key components were identified by the evaluation for assessment of the Government commitments: legislation (including Montreal Protocol compliance); customs and border security; training of refrigeration servicing technicians; recovery and recycling programs. The Government adopted a package of legislation related to the country commitments under the Montreal Protocol. Indicators associated with the legislative measures have been considered in relation to the IS project in other sections of this assessment. Other components have been discussed under training and recovery and recycling projects.

3037. The GEF required, as a condition of the provision of financial assistance, that Tajikistan became a Party to the Vienna Convention and the Montreal Protocol, and the London Amendment. Tajikistan joined the Vienna Convention in 1996 and acceded to the Montreal Protocol and its London Amendment in January 1998. It took more time to accede to three remaining MP instruments. With efforts put forth by the NOU, Copenhagen, Montreal and Beijing amendments were ratified by the Parliament of Tajikistan in May 2009. Acceptance of all 6 instruments by a country indicated that the government was fully committed to being bound by all the control measure obligations and requirements contained in the Montreal Protocol.

3038. The Decision XIII/20 of the Parties mandated the Government to adopt the licensing system in 2002. The relevant legislation was approved by the Cabinet in December 2002 to comply with this decision. The timely approval of this legislation reduced the demand for ODS and encouraged the use of alternatives, and served as a driver for launching the implementation of training and R/R programmes.

3039. Additionally, the legislation that mandated ozone-depleting substance (ODS) recovery, recycling and reclamation ("3R") operations and reporting the results of the 3R was implemented in Tajikistan. The Government put in place qualification requirements for personnel that serviced refrigeration and air conditioning equipment. These regulatory measures further enhanced the effectiveness of training and R/R programmes.

3040. The Government support of the NOU was not part of the MOU at the time of establishment of the NOU in Tajikistan. Such commitments have been obtained from the Government in conjunction with IS extension approved by the GEF Council.

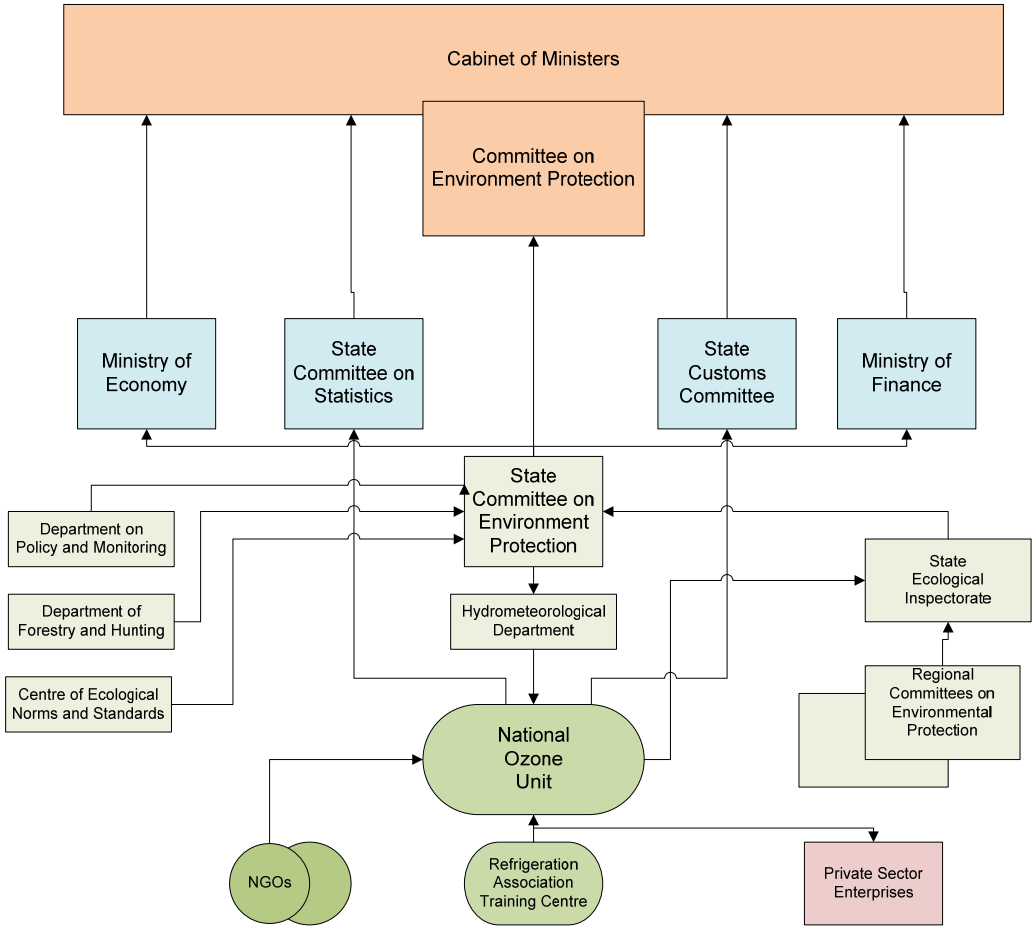
3041. The evaluation concludes that the Government commitments in Tajikistan effectively minimized ongoing damage to the ozone layer.

8.10.2.8.3 Stakeholder involvement

3042. The National ODS Phase out Programme is included in the National Development Plan until 2015 and the National Strategy of Alleviation of Poverty (2007-2009). The Ministry of Nature Protection through the NOU is in charge of the implementation and coordination of the National Programme on ODS phase out. Several Ministries and Governmental institutions are directly involved into the implementation process such as Committee on the Environmental Protection of the Cabinet of Ministers, State Customs Committee, State Committee on Statistics, Ministry of Economy as well as Ministry of Finance, Ministry of Foreign Affairs, Academy of Science, State Committee on TV and Radio Broadcasting, Ministry of Education. The NOU is interacting regularly with the Refrigeration Association and its training centres in the implementation of the training and R/R components. The NOU worked together with the Central Asian Regional Ecology Center (NGO) and educational facilities promoting awareness of ozone and MP related issues.

3043. Figure 39 shows the linkages of the NOU with major national Governmental and private institutions.

Figure 39: Government structure in Tajikistan for the implementation of the Montreal Protocol



8.10.2.8.4 Financial planning

3044. The financial planning and control were exercised by the UNEP DTIE staff together with UNEP GEF Financial Management Officer. The allocation of cash was based on the review of quarterly and semi-annual progress reports, properly formatted expenditure reports, plans of future actions and requests for cash advances with clear time tables prepared by the NOU. The monies have been transferred to the NOU through local UNDP office in Dushanbe. The evaluation team was not provided the access to financial planning documents and, therefore, is not in a position to comment in full on the appropriateness of financial planning standards applied by UNEP and UNDP.

3045. The NOU indicated to difficulties in following the UNEP/UNDP reporting and financial procedures. The format and reporting requirements have been changed by DGEF that contributed to delays in provision of funds and caused rescheduling the implementation of training activities. The NOU experienced problems in receiving the outstanding balances from UNDP once a financial year closed. The problems were usually resolved after the FMO interventions. The NOU pointed out to encashment disadvantages due to discrepancies in local exchange rates and those used by the UNDP office.

3046. The NOU activities and accounting were subject to regular national financial auditing.

8.10.2.8.5 UNEP / UNDP Supervision and backstopping

3047. UNDP was responsible for formulation and implementation of investment sub-projects with the private sector involving the United Nations Office for Project Services (UNOPS) for procurement and project management that relied mainly on international consultants. UNDP widely engaged its country office that provided interactions with the Government and also served as a financial institution supporting UNDP investment activities and UNEPs institutional strengthening and training components.

3048. UNEP was a lead agency in the country program preparation and in implementation of institutional strengthening and capacity building, awareness raising and training activities. UNEP DTIE was a responsible supervising organization since the inception of the NOU in 2001 until 2003. This period was the period of initiation and learning for the newly formed NOU. The NOU staff experienced difficulties trying to adopt new reporting requirements and financial procedures of two international organisations. The problems were exacerbated by the frequent changes in supervisory staff in UNEP DTIE and the language barrier. In 2004, UNEP GEF took over the supervisory role.

3049. It should be mentioned that similar problems have been successfully addressed by the Multilateral Fund through the networking of ozone officers. The GEF approach did not envisage establishment of such institutions. Instead, the GEF organised the regional compliance project for 21 countries. Regrettably, Tajikistan and other Central Asia NOUs could not fully benefit from early workshops due to lack of communication in Russian. The NOU highly appreciated the GEF support enabling its participation in East European and Central Asia network.

3050. There were no supervisory missions to Tajikistan on the part of UNEP DTIE and DGEF during the project. In April 2004, UNEP DTIE and DGEF organised the Workshop on Management of GEF-funded Ozone Projects: “Enhancement of Reporting Procedures”. The Workshop proved to be very useful for the reallocation of the balance of IS project of US $33,000 and extension of the project until 2005.

8.10.2.8.6 Co-financing and Project Outcomes & Sustainability

3051. The Government declared co-financing of the IS project amounting to US $21,000 (in-kind). Reporting of in-kind co-financing was not a part of the original project reporting. There have been no official lists of leveraged resources for the projects of the Ozone portfolio, as this was never mandatory for Ozone projects. However, with the extension of projects, and expansion of some of the originally designed activities, the Government has undoubtedly put resources forward (in the form of extra working hours, human resources, provision of office space) in support of the project.

3052. The importance of the Government contribution was crucial after the financing of the IS project was closed in June 2006. The Government support of the NOU was very limited and continued

until the GEF support was resumed in March 2009 under the new extension of the IS project approved by the GEF Council in 2007. It is problematic to expect significant co-financing in countries with high level of poverty such as Tajikistan.

3053. The Government commitments are more important factors to maintain sustainability of project outcomes. Sustainability of the process of ODS elimination depends mainly on the institutional capacity to enforce the existing legislation and end-user and consumer awareness. The delay in provision of funds by UNEP DGEF to the NOU put at risk the outcomes of the IS project achieved.

3054. The precise amount of in-kind financing was not recorded. The loss of one source of funding for a prolonged period did not result in closure of the NOU because it depends on multiple sources of funding for its operation, and in this sense there is sustainability beyond the funding period of the project.

3055. This 2.5 year gap in funding demonstrated that the lack of funds for this period did not result in closure of the CCCC, and hence their operations were assessed as sustainable. The sustainability of the CCCC could be attributable to multiple sources of funds, so when one source such as UNEP is delayed it does not result in a closure of the CCCC.

8.10.2.8.7 Delays and Project Outcomes & Sustainability

3056. Originally, the implementation of IS and associated training components were planned for the period 201-2003. The implementation of the second phase in training of refrigeration technicians and custom officers was deferred to 2004-2006. Respectively, the IS project was extended several times to match the implementation schedule of training components within the same approved budget. It should be noted that delays did not affect negatively the achievement of benchmarks established in Decision XII/20 established by the Parties. In certain degree, the extension of IS project helped in maintaining the continuity of the operation of the NOU in anticipation of the continuation of GEF funding. The major outcomes such as the complete phase out of Annex A and B controlled substances and the enforcement of adopted legislation were sustained.

8.10.2.9 Project ratings

3057. The ratings of the IS project is rated according to categories and criteria specified in Annex 1 of the Terms of Reference of the evaluation. The ratings are presented in Table 56.

Table 56: Project ratings for the Institutional Strengthening project in Tajikistan

Criterion	Evaluator's Summary Comments	Rating
Attainment of project objectives and results (overall rating)	All the project objectives were attained	**HS**
Effectiveness	All the project objectives (ODS phase-out; availability of ODS-free technology and products; introduction of ODS containment practices; raised awareness; strengthened institutional capacity; established country commitments) have been successfully met.	**HS**
Relevance	All project outcomes are fully consistent with GEF strategy in ozone and climate focal areas and Government priorities.	**HS**

Criterion	Evaluator's Summary Comments	Rating
Efficiency	The financial support to the NOU was extended for another three years (2004 - 2006), with financing from the original funds since not all the planned activities were completed. This extension did not affect negatively the compliance with MP requirements. However, the objectives of project could have been met faster had the UNEP overall and financial management would be more efficient.	**S**
Sustainability of Project outcomes (overall rating)	The disruption in GEF financing of the NOU put the sustainability of project outcomes at risk	**ML**
Financial	The GEF financing of the NOU stopped in 2006. The scope of activities of the NOU has been substantially reduced. The Government provided very limited support. The GEF funding was resumed only in 2009 putting the financial sustainability of the NOU and project outcomes at evident risk.	**ML**
Socio Political	Legislative and enforcement measures created conditions for the sustainability of project outcomes.	**L**
Institutional framework and governance	The strengthened institutional capacity and Government commitments ensured the institutional sustainability and governance.	**L**
Environmental	There is still high demand for ODS refrigerant and, respectively, a risk of ODS illegal trade.	**ML**
Achievement of outputs and activities	All the fifteen outputs were achieved. The implemented outputs and activities created a solid base for attaining objectives and meeting planned outcomes.	**HS**
Monitoring and Evaluation (overall rating)	The design of the IS project is not reflective of state-of-the-art project management. The implementation of M&E plan was good quality due to the high political profile of the national ODS phase-out programme.	**MS**
M&E Design	The design of the IS project is not reflective of state-of-the-art project management practices and lacking of result-based management and accountability framework. Risk analysis was also not a part of project design.	**MU**
M&E Plan Implementation (use for adaptive management)	The implementation of the national ODS phase-out programme had a high political profile in the country and was supervised by the Cabinet of Ministers. The Ecological Inspectorate and its regional offices interacted with the NOU directly and assisted in monitoring of data on ODS consumption. The ODS phase out was monitored by UNEP against the baseline through cross-checking of Article 7 data reported to the Ozone	**S**

Criterion	Evaluator's Summary Comments	Rating
	Secretariat. The routine monitoring of progress was primarily based on the review of quarterly and semi-annual reports submitted by the NOU to UNEP DTIE and later to the GEF TM and FMO and well reflected in annual UNEP GEF PIRs. Due to delays in processing of expenditure reports and cash advances, not all kind of activities were implemented in a timely fashion.	
Budgeting and Funding for M&E activities	No supervisory and monitoring visits were mounted by UNEP and DGEF. The internal monitoring of ODS phase out activities by the NOU staff and local consultants was covered from the budget of the IS project.	**MS**
Catalytic Role	No ratings are requested for the catalytic role.	
Preparation and readiness	The project document was associated with the country programme that had a high political profile. The Government established the Interagency Committee (IC) composed of representatives of key ministries and agencies concerned. The Head of the NOU (the First Deputy of the Chairman of SCEF) was appointed as a Coordinator of IC. The project management proved to be adaptable and the execution benefited from high level of Government commitments. The project design was lacking the logframe and performance indicators.	**S**
Country ownership / motivation	The Government demonstrated the high level of commitments and ownership in meeting the requirements of the MP.	**S**
Stakeholders involvement	The project involved all relevant stakeholders in project preparation and execution.	**S**
Financial planning	The project had moderate shortcomings in flow of funds that had some negative impact on timely delivery of outputs.	**MS**
UNEP Supervision and backstopping	In general, UNEP fulfilled its role of the supervisory agency. At its initial stage, the NOU staff experienced difficulties trying to adopt new reporting requirements and financial procedures. No supervisory missions were undertaken to the country.	**MS**
Overall Rating	All the objectives of the project were met with minor shortcomings.	**S**

8.10.3 GF/4040-02-03- Training of trainers for use of ODS-free refrigerants, including training of custom officers (UNEP);

8.10.3.1 Background

3058. UNEP and UNDP in close co-operation with the Government prepared the National ODS Phase out Programme using the 1998 ODS consumption as the baseline. The total ODS consumption was 60.1 ODP tonnes. The majority i.e. 96.5 % of the total consumption was in the refrigeration servicing sector. The ODS phase out in the refrigeration servicing sector requires a systematic

approach based on a comprehensive, multi-faceted strategy aiming at establishing the proper sequencing of projects and policies that proceed in a coordinated way. Such strategy was reflected in the Refrigeration Management Plan (RMP) developed by UNDP. The training of technician in good practices is part of the RMP along with training of custom officers in controlling imports of ODS, recovery and recycling, including a hands-on training on the respective practices. These projects are complemented by additional measures such as improvement of data collection, monitoring, awareness raising, and other related activities. The RMP identified 105 refrigeration servicing outlets in the country with total 230 servicing technicians. The RMP estimated that the introduction of good servicing practices and maintenance would result in reduction of CFC refrigerant consumption and emissions equal to 9.54 ODP tonnes in 1999.

8.10.3.2 Attainment of objectives and planned results

8.10.3.2.1 Objectives, outputs, outcomes and performance indicators

3059. The training project's objectives are to lend technical support, provide technical information and demonstrate procedures and practices to refrigeration servicing technicians that reduce and eliminate emissions of ODS refrigerants during preventive and unscheduled repair and maintenance. This project also provided the Customs Department with ODS detection equipment to enable identification of ODS imported in bulk quantities and in equipment and would provide hands-on training for selected customs officials from the various checkpoints in the country who, respectively, influence the movement of ODS across borders and consumption in the country. In the absence of the logframe for the evaluation of the training components, the performance indicators were inferred from the outputs/ deliverables contained in the project document and UNEP PIRs (Table 57).

Table 57: Objectives/ Intended Results - Outputs/Deliverables - Outcomes/Performance indicators

Objectives/Intended Results	Outputs/Deliverables	Outcomes/Performance indicators
1. Training of adequate number of local trainers in good servicing practices to reduce ODS emissions	1. Procurement and delivery of training equipment; 2. Establishing a training center; 3. Development and translation of training curricula and manuals; 4. Conducting Train-the-Trainer Workshops (Phase 1); 5. Certification of trainers ;	1. Availability of adequate number of local trainers. • Time required by UNEP to disburse GEF funding; • Timely establishment and availability of equipped training center; • Availability of training materials in the training process; • Number of certified trainers;
2. Training of refrigeration technicians in good servicing practices to reduce ODS emissions	6. Establishing regional training centers equipped with training equipment; 7. Dissemination of information about training programme among servicing	2. Introduction of good servicing practices into routine operation of servicing network and reduction ODS emissions. 3. Contribution to meeting

Objectives/Intended Results	Outputs/Deliverables	Outcomes/Performance indicators
	companies around the country. Compilation of lists of participants and training schedule. 8. Conducting training workshops for servicing technicians (Phase 2); 9. Organizing testing and certification of trainees;	the ODS phase-out schedule. • Availability of functioning training centers; • Number of months elapsed since training-the –trainers workshop; • Number of trained and certified technicians; • Reduction in ODS emissions due to introduction of good servicing practices; • Continuation of the training programme after the project;
3. Availability of trained custom officers and check points equipped with refrigerant identifiers	10. Procurement of refrigerant identifiers; 11. Establishing training centres; 12 Development and translation of a training manual; 13. Conducting a training workshop for trainers with participation of higher level officials from customs and other government departments (Phase 1); 14. Conducting the training programme on application of the licensing system and identification equipment for customs officers at border checking points(Phase 2);	4. Enforcement of ODS import licensing and quota system through training of customs officers and providing refrigerant identifiers to border check points. 5. Reduction in illegal trade of ODS. 6. Improvement in ODS data collection resulting from the raised awareness about ODS import licensing and quota system among higher level officials from customs and other government departments; • Number of customs training courses conducted and officers trained; • Establishment of in-country customs training capacity; • Continuity (follow-up, refreshment) of training activities; • Curricula and material used in customs training; • Adequate number of Identification equipment supplied; • Effective use of identifiers; • Availability of computerized customs data system;

Objectives/Intended Results	Outputs/Deliverables	Outcomes/Performance indicators

8.10.3.2.2 Effectiveness

8.10.3.2.2.1 Training in the refrigeration servicing sector

3060. The training component was implemented by UNEP in co-operation with the UNDP country office. The training component was approved by UNEP in January 2002. GEF funds were disbursed in April 2002. It took 16 months for UNEP to start disbursement of funds for the implementation of the training component.

3061. The training of refrigeration technicians is an important element of the Refrigerant Management Plan and recognized as a good driver for reduction of CFC-12 refrigerant in servicing operations. The director of Refrigeration Centre Ltd. (Dushanbe) was very actively involved in the implementation of the training programme. He acted as a deputy of the head of the NOU at the initial stage and as a consultant in refrigeration.

3062. The NOU staff and a refrigeration expert prepared a training module for the training program. The Russian version of the UNEP manual "*Good Practices in Refrigeration*" was received from Uzbekistan and further adapted. The NOU selected candidates to be trained as refrigeration instructors among most experienced professionals. Notwithstanding that the delivery of equipment for the training centre was delayed until October 2002, the Phase 1 "*The Train the Trainers*" workshop was held in June 2002 in Dushanbe in a temporary training centre where 19 refrigeration technicians were trained and were certified as trainers for the Phase II training. A refrigeration expert from the Uzbekistan was invited as an instructor for the workshop, and he was assisted by staff of the NOU. The training curriculum covered issues related to the Montreal Protocol, Governmental regulations on ODS and practical aspects of good servicing operations including recovery and recycling. Additionally, training on refrigerant recovery and recycling was provided by UNDP in July 2002. This training component will be discussed under TAJ/00/G35- - National programme for recovery and recycling of ODS refrigerants (UNDP/UNOPS).

3063. Two permanent training centres have been established following the precedent set by the Refrigeration Centre Ltd: one in Dushanbe and one in Khundzhand. In November 2004, the Refrigeration Association (RA) was established in Tajikistan and registered as a non-governmental organization. The RA took an active part in organising the subsequent training of servicing technicians. By the end of 2005, the scheduled Phase II training was carried out using the trainers from Phase 1 to train technicians in different parts of the country. About 42 months elapsed before the Phase 2 was implemented. The delay in commencement of Phase 2 was caused by difficulties in disbursement of financial resources from UNEP via UNDP local office to the NOU. The training programme continued until the end of 2006.

3064. This training project was crucial for the successful implementation of the Refrigerant Management Plan due to the significant contribution of the refrigeration sector to the overall ODS consumption in the country. Altogether, 15 training seminars for refrigeration servicing technicians in different geographical regions resulted in 334 trained technicians. All participants passed the test on completion of the training and received official certification, as well as service kits. The technicians were pleased with the tools in the kit and they demonstrated proficiency in the application of good servicing practices and evacuation and recovery of refrigerants.

3065. The outcomes of this training component were achieved. Good servicing practices have been introduced into routine operation of servicing network resulting in reduction of ODS emissions. Some servicing shops flushed the system with CFCs to eliminate the air from the system, and then vented the flushed CFC into the atmosphere prior to final charging. It is assumed that as a result of training and provision of vacuum pumps the bad practices of venting that considered to be normal, have been virtually eliminated. The quality of repair work has also improved because of training resulting in reduced leakage rate and CFC emissions. The indicator of positive impact of training is the significant decline in the demand for CFC refrigerant. However, it is not possible to quantify the impact of this training component in terms of ODP phased out since the

methodology of monitoring and impact assessment was not developed and put in place by UNEP as part of the implementation process.

3066. The RMP estimated that the introduction of good servicing practices and maintenance would result in reduction of CFC refrigerant consumption and emissions equal to 9.54 ODP tonnes. Only limited number of trainers has been trained during Phase 1 that was implemented in June 2002. The Phase 2 of the training programme commenced with a significant delay at the end of 2005. The CFC consumption was zero in 2004 in Tajikistan. Therefore, only insignificant phase out of CFC consumption, if any, could be attributed to the UNEP training component.

3067. The introduction of good servicing practices and maintenance and availability of trained servicing manpower contributed to the reduction in demand of CFC refrigerant once legal imports stopped in 2004.

3068. The next phase of the training programme is supposed to be supported from the extension of the GEF grant for the Institutional Strengthening. The funding has been recently transferred to the UNDP office in Dushanbe. The trainees will be provided with the certificate that will be later used as a proof of qualification that is necessary for the application for the license. The procedure of issuing the licenses has been debated in the Government and will be established in the near future.

8.10.3.2.2.2 Training of customs officers

3069. The NOU established good relationship with the State Customs Committee (SCC) that was initially incorporated into the Ministry on State Income and Taxes. The SCC was involved in the development of ODS related legislation. The NOU officer and officials from the State Customs Committee and the Environment Inspectorate from Tajikistan participated in the workshops held in Baku, Azerbaijan (June 2000) and in Budapest, Hungary (May 2004).

3070. The GEF training component financed the training of customs officials and procurement of ODS detection equipment provided to the Customs Department that enabled identification of ODS imported in bulk quantities and in equipment. The NOU organized Phase 1 of the Train-the-Trainer course for 18 custom officials in December 2002 when the legislation on the establishing of the license system was adopted. The timing has been properly chosen. Representatives also attended the course from the Ministry of Economy and Trade, Ministry of State Income and Taxes, Ministry of Justice, Ministry of Finance and State Inspection of Plants Quarantine. Training of customs officers and provision of adequate identification equipment were needed to ensure effective application of the ODS imports licensing system. The participation of representatives from other Governmental institutions *inter alia* made possible the creation and strengthening of an informal network to combat illicit entry of ODS.

3071. The customs operations manuals for the customs officers were developed by UNEP and distributed among participants. This manual offers background information on ODS issues including an overview of the MP, its amendments and national phase out strategies and was, therefore, used as the main teaching material. It also provided in-depth information on the national legislation and licensing system, revised customs codes, monitoring and control system for ODS and ODS containing products, and relevant implications for routine operations of customs officers.The instructors and speakers for the workshop were two UNEP international consultants. They were assisted by the NOU staff and several concerned Government departments. The certificates were provided after conducting verification tests at the end of the course.

3072. Phase 2 of training was conducted in 2006 for 87 officers representing 22 entry points in four regions. The training curriculum covered issues on ozone layer depletion and the Montreal Protocol provisions, national regulations concerning ODS, methods of identification of ODS, and illegal trade in ODS. A practical session on identification of ODS using refrigerant identifiers was also part of the agenda. At the end of the workshop, each participant who passed the test received a certificate. In total, 32 instruments have been procured: 22 ODS identifiers were distributed among regional entry points and 10 units were provided to the central laboratory. In case of suspicious shipments, customs generally do a physical check of the content using identifiers and notify the responsible authority (generally the NOU). Although difficult to quantify, the effectiveness of import licensing and prevention of illegal imports of ODS is highly

dependent on the ability of customs officers to apply the legal regulations in force and to identify illegal shipments of refrigerants. Respectively, the training of customs officers was crucial in supporting the legal system.

3073. The identifiers are simple to use and provide consistent and accurate results. The refrigerant identifiers supplied are able to detect R12, R22, R134a, HC and air and show the proportion of each in a sample from a cylinder or a system. The identifiers have mainly been used by customs officers to verify cylinder contents. They cannot identify any blends based on HCFCs or HFCs. In such cases, the reading "unknown" would appear and only a laboratory would be able to identify the product with a gas chromatograph.

3074. There is still a demand in Tajikistan for CFC refrigerant so the illegal trade is still in place. There were not many cases of interception of ODS (mainly CFC-12). The illegal trade in ODS was associated with smugglers carrying small quantities of ODS without licenses. The SCC informs regional ecological inspectors when they intercept ODS at the border. Regional ecological inspectors work closely with SCC. Ecological inspectors identified significant quantities of CFC-11 and CFC-12 mixture (2,300 kg) at former aluminium plant and the inventory of 6,000 kg of CFC-11 in the closed refrigerator manufacturing plant. All these quantities are sealed and checked for leakage.

3075. The rotation of customs personnel at entry checkpoints is very frequent, which has the disadvantage of leaving only a few from the 87 ODS-trained officers available for duty. The NOU recognized the value of regular training of customs officers, as the nomenclature of substances and equipment changes frequently, and to have the detection equipment calibrated. The customs are using six digit harmonized code system that is not able to handle emerging refrigerant blends. The SCC is considering the introduction of additional national two-digit codes.

3076. The SCC Customs departments annually report on registered imports of controlled substances to the NOU. Monitoring based on customs statistics, import licenses issued and importers' records allow for transparency and provide, despite some mistakes detected, a fairly reliable data basis for calculating trade and consumption of ODS. The SCC is developing a common computer system interconnected locally with the NOU and internationally with countries members of the Eurasian Economic Community (Belarus, Russia, Kazakhstan, Kyrgyzstan and Tajikistan). The future electronic network coupled with licensing systems would allow for the generation of automatic notification to the receiving countries of authorized exports of ODS. These notices could also be sent to other ozone officers at the regional level. Such systems also allow for the generation of reliable up-to-date statistics.

8.10.3.2.3 Relevance

3077. The Table 4 show how inputs and outputs have been transformed into specific and tangible outcomes. The outcomes of the training component are fully in agreement with the strategy and priorities outlined in the country programme.

3078. The training component being part and parcel of the ODS phase out programme is fully consistent with the GEF ozone focal area. More details were provided in the relevant Sections above.

8.10.3.2.4 Efficiency

3079. The ODS phase out target of the training component was established at 9.54 ODP tonnes of national consumption. This target was not attained since the Phase 2 of training was delayed and started when the CFC consumption was reported to be zero. In general, it is difficult to measure the success of the training of refrigeration servicing technicians in terms of quantities of avoided emissions and reduction in the use of CFC refrigerants since the reliable methodology does not exist. It is obvious, however, that introduction of good servicing practices resulted in elimination of flushing the refrigeration systems with CFC-12, reducing the number of cases of overcharging the system with the CFC refrigerant and cutback of leakage rate due to better quality of repair.

3080. The number of trained technicians (355) exceeded the total number of servicing staff as estimated in the RMP (230). The efficiency is assessed as amount of $345 spent on training of one servicing technician. The efficiency in dollar terms could not be calculated for customs training component since the evaluation team had no access to the financial documentation

reflecting the breakdown of the cost for training and procurement of ODS identifiers.

3081. There was a lag in the implementation of the Phase 1 and Phase 2 of refrigeration technicians and customs officers of 42 months. Phase 1 was conducted in 2002, while the last training workshop of Phase 2 was completed in 2006. The efficiency of the implementation and respectively avoided emissions would be more beneficial had the timing between Phase 1 and Phase 2 were shorter.

8.10.3.3 Assessment of Sustainability of project outcomes

3082. The assessment of sustainability of outcomes was made for two sub-components: training of refrigeration technicians and associated distribution of modern servicing tools; and training of custom officers and delivery of refrigeration identifiers to border checking points.

8.10.3.3.1 Financial resources

3083. The training centre that was created under the training component has been continuing its activities upon completion of the project. The training centre has been managed by the NOU jointly with the Refrigeration Association (RA). In 2008, 14 servicing technicians and 12 ecological inspectors have been trained free of charge using resources of the RA. In 2009, GEF funds approved under the IS project extension has been disbursed. The training activities will continue using GEF resources. The financial risk for sustaining outcomes is very low.

8.10.3.3.2 Socio-political

3084. The Government commitments to continue the ODS phase out activities are strong. In 2009, the Parliament ratified the Montreal and Beijing amendments to the Montreal Protocol. The NOU and SCC agreed to continue training of customs officers. Socio-political risk is insignificant.

8.10.3.3.3 Institutional framework and governance

3085. The participation of high level officials in the Phase I seminars facilitated the raising of awareness of the training programme. The top customs officials supported the introduction of import controls and the organization of Phase II courses. Currently, the number of trained custom officers is diminishing due to high rotation of the personnel. The management of the SCC committed to further strengthening the role of the customs in enforcement of ODS control regulations, including the continuation of training activities.

3086. It would be more effective if Phase I (Train-the-Trainer) and Phase II (Training of customs officers) takes place in rapid succession in order to preserve the momentum generated by the Train the Trainer workshops.

8.10.3.3.4 Environmental

3087. With the diminishing number of trained custom officers and existing demand for CFC refrigerant, there is a risk of illegal trade. The presence of major stakeholder commitments will mitigate such a risk.

8.10.3.4 Catalytic role

3088. The project has a distinct replication effect once the GEF funding was over. The availability of the equipped training centre provided opportunity for the continuation of training under the supervision of the Refrigeration Association. In 2008, servicing technicians and ecological inspectors have been trained using available training facility.

3089. The servicing staff that received training has been continuously providing hands-on training of new young personnel in servicing enterprises. Typically, the servicing team is composed of three technicians; two of them are trained staff and the third one is a less experienced worker who is receiving hands-on training.

8.10.3.5 Achievement of outputs and activities

3090. The achievement of outputs and activities is analysed in Section: Attainment of objectives and planned results: Effectiveness. All 14 planned outputs were achieved. The implemented outputs and activities created a solid base for attaining objectives and meeting planned outcomes.

8.10.3.6 Assessment of Monitoring and Evaluation Systems

8.10.3.6.1 M&E design

3091. Similar to IS project, the training component was managed by DTIE office in Paris until early 2003 when GEF Task Manager and Finance Management Officer in Nairobi took over the operational control. The NOU has also exercised the monitoring functions. The M&E design has been addressed by mid-term evaluation team. The 2004 mid-term evaluation report (MTER) identified shortcomings of the M&E system design, in particular, the report called to review and determine the adequacy of Performance Indicators (PIs) where they exist and assign PIs where they don't exist. The Report recognized also the lack of result-based management and accountability framework.[543] The 2005 Project Implementation Reports (PIR) prepared by the GEF TM indicated to similar problems. The assessment of M&E design in regard to the IS project as contained in Paragraphs 64 to 67 is also relevant to the M&E of the training component.

3092. Training in good practices and provision of basic tools resulted in some reduction of consumption of CFC-12 in the servicing sector. The achieved results have been monitored and judged by the number of trained and certified technicians. However, the achievements of training component in terms of reducing ODS consumption could not be verified. The practical use of knowledge transmitted through training has not been monitored and documented. UNEP DTIE did not develop and apply the appropriate methodology to determine the baseline, performance indicators and progress achieved by this training component in terms of relevant reduction in ODS consumption.

3093. The monitoring and evaluation system does not appear to be adequate to measure the level of success of the training of custom officers. The monitoring was limited to the number of customs officers trained and certified, and the number of refrigerant identifiers delivered to border check points. The reporting of the number and quantity of intercepted illicitly traded ODSs was not a requirement, nor the frequency of use of identifiers by officers.

8.10.3.6.2 M&E plan implementation

3094. The internal monitoring of ODS phase out activities by the NOU staff and local consultants was covered from the budget of the IS project. The monitoring functions were part of working responsibilities of UNEP DTIE and DGEF staff. There is limited information on monitoring activities of UNEP DTIE and DGEF. The evaluation team had no access to internal documentation of these two organizations. The mid-term evaluation report covers this subject.

8.10.3.6.3 Long-term Monitoring

3095. It is envisaged that the long term monitoring of outcomes of the training component would be the responsibility of the Government and the NOU. The NOU is continuing monitoring and organizing follow up training of refrigeration technicians and ecological inspectors in cooperation with Refrigeration Association, and customs officers in cooperation with the State Customs Committee.

8.10.3.7 Assessment of processes that affected attainment of project results

8.10.3.7.1 Preparation and readiness

3096. The training component was designed as a part of the RMP within the 3-year timeframe to be finalized in 2003. The establishment of the training centres, the development of training manuals and Phase 1 of training were accomplished in 2002. Due to communication and reporting problems between UNEP DTIE and the NOU the necessary funds have not been disbursed in time, the implementation of Phase 2 of training the refrigeration technicians and customs officers was delayed until 2006.

3097. The UNEP and DGEF realized the existence of management problems and in April, 2004 organized the Workshop "Enhancement of Reporting Procedures" with participation of NOU representatives from Central Asian CEITs. The problems were resolved and the implementation of training components has been resumed.

[543] Mid-term evaluation report 4 July 2004, Victor Buxton and Risto Ciconkov

8.10.3.7.2 Country commitment; Stakeholder involvement

3098. The training of refrigeration technicians and customs officers was part of the approved country programme. The Government institutions actively supported the training programme delegating representatives from State Statistics Committee, Ministry of Justice, Ministry of Economy and Trade, Ministry of Finances to Phase 1 training workshop for customs officers. The presence of officials from the ministries and agencies raised awareness about MP issues, ODS import licensing and quota system issues, and enhanced communication between the NOU and governmental entities involved.

3099. Upon completion of the UNEP training program, the NOU organized the continuation of training ecological inspectors and refrigeration technicians in cooperation with the Ministry of Environment Protection and the Refrigeration Association.

8.10.3.7.3 Financial planning

3100. The concept of the RMP presupposes that planned actions are scheduled and implemented in accordance with the agreed sequencing. The timely availability of financial resources is the key for the success. However, the effective financial planning proved to be a challenge for UNEP DTIE and FMO in implementing the training programme in Tajikistan. The disbursement of resources for the establishing of the training centre was delayed. The NOU has overcome this barrier and organized a temporary training centre to start the implementation of Phase 1. The Phase 1 was accomplished at the end of 2002 both for training-the-trainers in refrigeration and customs. The timing of Phase 1 coincided with adoption of legislation on ODS imports licensing system earlier in 2002.

3101. The best plan to be followed would be to organize the Phase 2 as much closer to Phase 1 to keep the momentum and fully use the available trainers. Unfortunately, it was not the case in Tajikistan. The disbursement of financial resources was again significantly delayed due to reporting and communication problems between UNEP DIE and the NOU. The problem was resolved in 2004. The implementation schedule was extended. The implementation of Phase 2 commenced 42 months after the Phase 1 and was accomplished by the end 2006.

8.10.3.7.4 UNEP / UNDP Supervision and backstopping

3102. UNEP DTIE was supervising the training component since 2001. There was an apparent rotation of backstopping officers in DTIE Paris office. However, the NOU received the required assistance. As mentioned in the previous paragraph, reporting and communication barriers caused certain delay in cash flow. UNEP DGEF took over the supervisory role in 2004. In April 2004, UNEP DTIE and DGEF organised the Workshop on Management of GEF-funded Ozone Projects: “Enhancement of Reporting Procedures”. There were no supervisory missions to Tajikistan on the part of UNEP DTIE and DGEF in the course of duration of the project.

8.10.3.7.5 Co-financing and Project Outcomes & Sustainability

3103. The co-financing was not a requirement for the training component. However, the NOU managed to continue the training programme for refrigeration technicians and ecological inspectors after the project was finished fully utilizing the available training facilities. The support of the Refrigeration Association was crucial. The continuation of training of customs officers is scheduled in 2009 as part of the IS extension project. It appears that sustainability of outcomes will not be negatively affected.

8.10.3.7.6 Delays and Project Outcomes & Sustainability

3104. In 2001, delays in availability of funding affected the timing of establishing the training centre. While awaiting the disbursement, the NOU established a temporary training centre. Consequently, the Phase 1 training started in the mid of 2002. The Phase 1 had an effect going beyond the training of trainers in refrigeration and customs. The participation of representatives from many Governmental agencies in training workshops enhanced communication capability of the NOU and facilitated raising awareness about MP issues in the country. The delay in starting Phase 1 has a little effect on the outcomes and sustainability.

3105. Delays in disbursement of GEF funding caused the postponement of Phase 2 training for about 42 months. By the time of funds disbursement in 2004 the imports of ODS was reduced to zero.

The Phase 2 of the training component had virtually no impact on meeting the ODS phase out targets. However, the Phase 2 training resulted in maintaining the low demand for CFCs in the servicing sector and curbing the illegal trade, and contributed to sustainability of outcomes.

8.10.3.8 Project ratings

3106. The ratings of the training project is rated according to categories and criteria specified in Annex 1 of the Terms of Reference of the evaluation. The ratings are presented in Table 58.

Table 58: Ratings for the training project in Tajikistan

Criterion	Evaluator's Summary Comments	Rating
Attainment of project objectives and results (overall rating)	Not all the project objectives were attained	**MS**
Effectiveness	All the project objectives were successfully attained: Introduction of good servicing practices into routine operation of servicing network and reduction and sustaining of ODS emissions; Enforcement of ODS import licensing and quota system; Reduction in illegal trade of ODS; Improvement in ODS data collection. The delay in disbursement of funds by UNEP led to postponement in starting Phase 2 of training until the end of 2004. Therefore, training components did not contribute to meeting ODS phase out targets.	**MS**
Relevance	All project outcomes are fully consistent with GEF strategy in ozone and climate focal area.	**HS**
Efficiency	It is not possible to measure the impact of the training programme in terms of ODP tonnes phased out. The efficiency was assessed as $ 348 spent per a trained servicing technician. The gap of 42 months between Phase 1 and Phase 2 diminished the overall effect of the training programme.	**MS**
Sustainability of Project outcomes (overall rating)	The ongoing demand for CFC refrigerant and continuing illegal ODS trade poses the moderate risk to the sustainability of outcomes of the training programme.	**ML**
Financial	The availability of resources from extended IS project and support of the RA makes likely the financial sustainability of the continuing training programme.	**L**
Socio Political	There is a continuing support to the training programme from the Government (MEP, SCC) and the NOU and RA.	**L**
Institutional framework and governance	The Government commitments ensure the institutional sustainability and governance.	**L**
Environmental	There is still high demand for ODS refrigerant and, respectively, a risk of ODS illegal trade.	**ML**
Achievement of outputs and	The major outputs and activities have been	**S**

Criterion	Evaluator's Summary Comments	Rating
activities	accomplished.	
Monitoring and Evaluation (overall rating)	The monitoring and evaluation system does not appear to be adequate to measure the level of success of the training programme.	**MS**
M&E Design	The achievements of training component in terms of reducing ODS consumption could not be verified. The practical use of knowledge transmitted through training has not been monitored and documented. UNEP DTIE did not develop and apply the appropriate methodology to determine the baseline, performance indicators and progress achieved by training components. in terms of relevant reduction in ODS consumption.	**MS**
M&E Plan Implementation (use for adaptive management)	The routine monitoring of progress in training was primarily based on the review of quarterly and semi-annual reports submitted by the NOU to UNEP DTIE and later to the GEF TM and FMO and well reflected in annual UNEP GEF PIRs. Due to delays in processing of expenditure reports and cash advances, the implementation of Phase 2 training fell 42 months behind Phase 1.	**MS**
Budgeting and Funding for M&E activities	The internal monitoring of training components was covered from the budget of the IS project.	**S**
Catalytic Role	The project has a distinct replication effect once the GEF funding was over. The availability of the equipped training centre provided opportunity for the continuation of training.	No ratings are requested for the catalytic role.
Preparation and readiness	The training of refrigeration technicians and customs officers were part of the country programme having a high political profile. The training centre was established timely by the NOU. The project management proved to be adaptable to changing circumstances and the execution benefited from high level of Government commitments.	**S**
Country ownership / commitment	The Government demonstrated the high level of commitments and ownership in supporting training activities.	**S**
Stakeholders involvement	The project involved all relevant stakeholders in project preparation and execution.	**S**
Financial planning	The project had moderate shortcomings in flow of funds that had some negative impact on timely delivery of outputs.	**MS**
UNEP Supervision and backstopping	The NOU staff experienced difficulties trying to adapt to reporting requirements and financial procedures. No supervisory missions	**MS**

Criterion	Evaluator's Summary Comments	Rating
	were undertaken to the country but workshop in management proved to be very useful.	
Overall Rating	All the objectives of the project were met with minor shortcomings.	**S**

8.10.4 TAJ/00/G35- - National programme for recovery and recycling of ODS refrigerants (UNDP/UNOPS);

8.10.4.1 Background

3107. The Government approved the RMP as part of its Country Programme which addressed the ODS phase out in the refrigeration sector through introducing ODS import licensing system, training refrigeration technicians, customs officers and adoption of the National Refrigerant Recovery and Recycling Programme. The overall 1998 CFC consumption was determined to be 56.3 ODP tonnes as a basis in the Country Programme. The Government took a policy decision to phase out ODS consumption completely by the year 2004. The bulk of CFC consumption was in the refrigeration servicing sector. A survey, completed by the Ministry of Environment Protection in 1999, indicated that the total of 100,000 CFC commercial and industrial refrigeration units will be the major source of recycled CFC-12 as these units usually contain larger amounts of CFC-12 than that contained in domestic refrigeration equipment. The quantities of CFC-12 in domestic refrigerator units amounted to about 1 million.

3108. The refrigerant recovery involves the removal of the refrigerant in vapour or liquid form for reuse or storing in an external container for subsequent recycling or destruction without testing or processing it. The refrigerant recycling means to process the contaminated refrigerant through oil separators and filter dryers using a recycling machine working predominantly at a local service shop. The refrigerant reclamation requires that the contaminated refrigerant be reprocessed using evaporation, segregation and distillation operations to meet new product specifications. The reclamation infrastructure represents a significant investment and may only be economical for large quantities of recovered refrigerant.

8.10.4.2 Attainment of objectives and planned results

8.10.4.2.1 Objectives, outputs, outcomes and performance indicators

3109. In 2000, UNDP formulated the ODS recovery and recycling (R&R) project in Tajikistan. Funding of $306,405 was allocated by the GEF to UNDP/UNOPS to implement the *r*ecovery and recycling of ODS refrigerants in the refrigeration and air-conditioning sector as part of a national Refrigerant Management Plan. The installation of reclamation facilities has not been under consideration due to limited quantities of refrigerants in the installed refrigeration equipment. The objectives of the R&R project were to assist meeting the Montreal Protocol targets established for Tajikistan through introduction of refrigerant conservation and containment measures combining good servicing, repair, and recovery and recycling practices. It was envisaged to reduce the demand in imported CFC refrigerant during 2001 to 2003 for servicing the existing refrigeration equipment through the use of recycled refrigerants. Once CFC imports were stopped in 2004, the recycled CFC turned out to be the only alternative source of CFC-12 refrigerant in the country. All the activities undertaken under the R&R project led to reduction of ODS emissions into the atmosphere The Project ODS phase out target was determined to be 15.6 ODP tonnes based on 1999 ODS consumption of 50.7 ODP tonnes.

3110. The proclaimed objectives have been attained by provision of recovery, recycling, and servicing equipment and training of personnel that received this equipment using UNOPS/UNDP facilities. The UNDP/UNOPS training was complementary to the training programme provided by UNEP. The outputs were defined as follows: delivery of the necessary R&R and servicing equipment to selected refrigeration servicing workshops; training of refrigeration technicians; lending technical support and provision of technical information; demonstration of recovery and recycling procedures and good servicing practices to refrigeration technicians. The NOU took

responsibilities for monitoring the recovery and recycling operations.

3111. The outcomes were defined as introduction of refrigerant recovery and recycling practices throughout out the country, resulting in the decrease of national CFC demand and the reduction of ODS emissions into the atmosphere. In the absence of the logframe for the evaluation of the R&R project and its training component, the performance indicators were inferred from the outputs/deliverables contained in the UNDP project document, and UNDP and UNEP PIRs (Table 59).

Table 59: Tajikistan ODS Recovery and Recycling Project - Objectives/ Intended Results - Outputs/Deliverables - Outcomes/Performance indicators

Objectives/Intended Results	Outputs/Deliverables	Outcomes/Performance indicators
1. Introduction of sustainable refrigerant containment and R&R practices and reduction in ODS emissions into the atmosphere 2. Reduction in CFC demand to meet the Montreal Protocol CFC phase out targets	1. Procurement and delivery of servicing, and recovery and recycling equipment 2. Development and promotion of legislation supporting R&R operations 3. Development and distribution of R&R manuals and regulations 4. Selection of participants and conducting training workshops on good servicing and R&R practices and certification of graduates 5. Distribution of R&R and servicing equipment among servicing workshops 6. Establishing a R&R monitoring system 7. Reporting R&R results	1. Adoption of legislation supporting R&R operations • 2. Establishment of ODS recovery and recycling system in the refrigeration and air-conditioning sector 3. Recovered and recycled ODS contributed to attaining the ODS phase out targets • Timely adoption of ODS imports licensing and quota system • Proper timing in procurement and delivery of R&R equipment; • Preparation and translation of R&R training materials; • Number of R&R trained and certified refrigeration technicians; • Number of R&R machines distributed to servicing workshops; • High CFC prices in relation to substitutes; • Quantity of ODS recovered and recycled; • Adoption of legislation promoting recovery and recycling operations; • Economic cost/benefits of adopted R&R programme; • Availability of R&R monitoring system during and after the project; • The availability of R&R data in the NOU.

8.10.4.2.2 Effectiveness

3112. UNDP/UNOPS were very active in the implementation of the R&R project. During 2000, the necessary specifications for R&R equipment have been formulated and the international bidding was organized. By May 2001, the R&R equipment have been procured and delivered to Tajikistan. The NOU made a survey of refrigeration servicing workshops and selected potential beneficiaries determined by their pattern and quantities of CFC refrigerants used in their servicing operations. In July 2001, the UNDP consultant arrived to Dushanbe and conducted three training workshops. The training manuals have been distributed among selected trainees. Three more training workshops have been organized by the NOU and the Refrigeration Association in different geographical regions in the fourth quarter of 2001. Altogether, 150 technicians have been trained and certified as R&R operators. The R&R equipment was provided in accordance with contracts between the NOU and beneficiaries. In compliance with the contracts, beneficiaries committed to report to the NOU on quantities recovered and recycled OD on a monthly basis.

3113. Under the project, 117 recovery machines and 50 manual recovery pumps and recovery bags were distributed to servicing companies and technicians. The project also provided 5 sets of recycling equipment strategically distributed around the country. Four technical recycling centres were created in largest refrigeration servicing facilities: two in Dushanbe and two in Khudzhand. Technicians that recovered more than 10 kg of refrigerant a month received a recovery machine; those with less recovered refrigerant received a manual pump and recovery bags. The target established by UNDP for the R&R project was 15.5 tonnes of CFCs recovered and reused annually based on 1998 CFC consumption. This target was not achieved. The maximum quantities of CFCs were recovered in 2008 to be 11.7 ODP tonnes.

3114. The national programme for Recovery and Recycling of refrigerants was implemented as a part of a national Refrigerant Management Plan. In great extent, the success of the R&R programme rely upon a proper sequencing and coordination between the adoption of legislation regulating the availability of imported CFC refrigerant and timing of R&R operations. The decree of the Government on the introduction of the CFC imports licensing and quota system was adopted in 3 December 2002.

3115. The evaluator visited “Rembyttechnica” in Dushanbe, which is one of four centres in Tajikistan used for the repair and servicing refrigeration equipment. Currently, the enterprise is staffed with 40 technicians dealing with servicing in the commercial and domestic sectors. There are about 20 repairs per technician in the busiest period from March to November. The enterprise received 8 recovery machines from the project. Typically, one recovery machine is designated to a team consisting of 3 technicians. Technicians determine the quality of the refrigerant during its extraction from the installation. If the refrigerant is clean it can be reused in the same equipment. Each team fills the log book every day with data on recovered refrigerant.

3116. The unclean CFC-12 refrigerant that requires further processing is delivered to the recycling centre (Figure 40) both by its staff and independent technicians and registered separately. The bulk of CFC-12 that is required for servicing the existing refrigeration equipment was supplied from recovered and recycled refrigerant collected in the centre.

Figure 40: Recycling centre in

3117. The establishment of an effective monitoring system is the important factor ensuring the success of the R&R programme. In particular, the monitoring system makes sure that: i) the recovery machines are distributed to guarantee the maximum efficiency of recovery operations, ii) the recovery and recycling equipment is properly used, maintained and timely supplied with spare parts; iii) proper records of the quantities of CFC recovered, recycled and reused are maintained. The monitoring of the efficiency of the recovery and recycling program has been carried out by the NOU since 2001 using resources provided under the Institutional Strengthening project. A good cooperation with the

Refrigeration Association was an important element of the monitoring system. Data on the recovered and recycled CFC-12 and HCFC-22 were reported by recovery/recycling centres on a monthly basis using the format developed by the NOU and stored in the NOU computer. Lack of data submissions from certain regions to the centre were correlated with disruptions in funding in 2003.

3118. The full account of recovered and recycled refrigerant is presented in Table 60. The recovery rate of CFC-12 was growing in 2001 to 2005. During this period, there was a noticeable progress in the replacement of old CFC-12-based equipment in the commercial with new equipment using R-404, R-22 and R-134a refrigerants and domestic refrigeration sector with HFC-134a refrigerant. Imports of CFC-12 stopped in 2004 as 2003 was the last year for legal imports of CFC-12 in Tajikistan (reported as 4.7 ODP tonnes). The stable relatively high recovery rate of CFC-12 was observed in the last three years (2006 - 2008). The increase in the recovery rate of CFC-12 is associated with diminishing availability of CFC-12 refrigerant. The constant growth in the price of virgin CFC-12 is the evidence of its dwindling availability. The growth in CFC-12 price creates market opportunities for expansion of CFC-12 recovery and recycling operations. The change in CFC-12 prices is shown in Table 3 Paragraph 29 above.

3119. The 2008 recovered and recycled quantities of CFC-12 reflect the existing demand in this refrigerant mainly in the domestic refrigeration sector that is still relatively high (about 37% of the total demand in 2001). There are still about 150,000- 200,000 domestic refrigeration appliances working with CFC-12 refrigerant in the country. The poor economic situation in the country does not allow low income households to replace their outdated appliances that require frequent repairs.

3120. The established target of 15.5 ODP tonnes of recovered and recycled CFC-12 was not achieved. The target proved to be extremely ambitious. There are several explanations of why it did not happen. Firstly, the target was based on 1998 CFC-12 consumption which was significantly reduced by the time of the start of recovery and recycling operations. Secondly, the target was assessed purely on the basis of the capacity of the recovery and recycling equipment without taking into account the distribution and availability of recoverable and recyclable refrigerants. Table 60 demonstrates the pattern of recovery operations in 2001 to 2008.

Table 60: Recovered and recycled refrigerants in Tajikistan from 2001 to 2008 (kg)

Refrigerant	2001	2002	2003	2004	2005	2006	2007	2008	Total
CFC-12	1,459	6,637	6,366	8,720	10,025	11,259	11,331	11,718	67,515
HCFC-22	571	2,105	1,934	3,174	3,893	5,519	14,621	15,676	47,493
Total	2,030	8,742	8,300	11,894	13,918	16,778	25,952	27,394	115,008

3121. The recovery of HCFC-22 is gaining momentum in the last couple of years. The growth in the recovery rate is correlated with the significant increase of the market penetration of the HCFC-22 based equipment in the commercial and air-conditioning sectors. Figure 41 shows quantities of imported and recovered CFC-12 and HCFC-22.

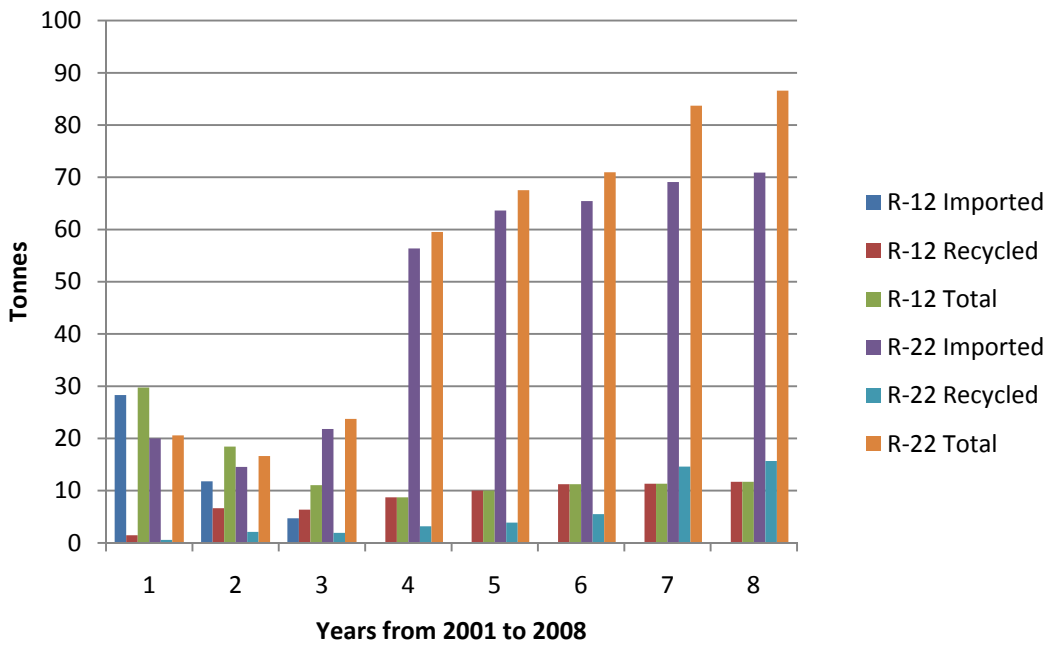


Figure 41: Quantities in Tajikistan of imported and recovered CFC-12 and HCFC-22

3122. The legislation on licensing and quota system to control imports of ODS was introduced within 11 months starting from the start of ODS recovery and recycling operations. This legislation successfully enabled the control of the availability of imported CFCs and had an effect on establishing a favourable price relationship between CFC and alternative refrigerants. Additionally, the legislation on licensing of ODS-related activities in regard to the installation, maintenance and repair of equipment containing ODS mandates recovery and recycling and reporting the results. The Government put in place qualification requirements for personnel that servicing refrigeration and air conditioning equipment. These regulatory measures further enhanced the effectiveness of training and R/R programmes.

3123. From analysis of performance indicators listed in Table 6, the conclusion can be drawn that outcomes of the ODS recovery and recycling programme have been achieved.

8.10.4.2.3 Relevance

3124. The R&R project s fully consistent with the GEF strategy in the ozone focal area and Tajikistan country programme. In broader terms, the recovery and recycling operations covered not only CFC but also HCFC refrigerants and contributed to the reduction of ODS emissions into the atmosphere. Since most CFC and HCFC refrigerants are also greenhouse gases, the reduction in ODS emissions was also a factor in reduced global warming, bringing substantial benefits to the climate.

8.10.4.2.4 Efficiency

3125. The cost-effectiveness of the project was assessed by UNDP to be US $18.3/kg ODP assuming the annual quantities of recovered ODS to be 15.5 ODP tones. As indicated in Paragraph 117 above, the targeted quantities of recovered ODS were not achieved. The actual cost-effectiveness is calculated on the basis of CFC quantities recovered in 2007 (see Table 7). The actual cost-effectiveness was US $25.04/kg ODP.

3126. Another efficiency factor can be applied for the assessment of the efficiency on the basis of annual quantities of recovered ODS (CFC-12 and HCFC-22 expressed in metric kg) per each recovery machine provided under the R&R project. The total quantity of ODS recovered in 2008 was 27,394 kg. Respectively the recovered ODS quantity per each of 60 recovering machines will be 456 kg.

3127. For the period from 2001 to 2008, the total quantity of recovered refrigerant was 67.42 MT and 47.93 MT of CFC-12 and HCFC-22 respectively. The calculated value of avoided imports of new refrigerants amounts to about US $0.99 million in prices for the respective year.

3128. In combination, the three parameters used for the assessment of the efficiency of the R&R project indicate that the project was very effective.

8.10.4.3 Assessment of Sustainability of project outcomes

8.10.4.3.1 Financial resources

3129. In May 2003 the project was officially closed. No financing from UNDP was coming to the country since then. Only monitoring activities continued with funding provided under the IS project. Since 2000, the prices of CFC-12 were relatively high (about US $7.00/kg) being at par with the major alternative refrigerant HFC-134. Since 2005, prices for CFC-12 increased exceeding HFC-134a creating the favourable market situation for sustainable CFC-12 recovery and recycling operations. In 2008, CFC-12 refrigerant is still available on the market at about 10.0 to 12.0 US $/kg. The cost of labour in Tajikistan is relatively cheap. The cost of the processing of 1kg of CFC-12 was about US $1.00/kg. It appears that recovery and recycling operations are economically viable and sustainable. The recycling centres replenish the deficit related to losses of about 10% of the total required quantities by purchasing the recovered CFC-12 from individual servicemen in Dushanbe and other regions for about US $5.00/kg.

8.10.4.3.2 Socio-political

3130. There is no socio-political risk to the sustainability of the R&R project. The stakeholder ownership ensures the sustainability of outcomes/benefits of the project.

8.10.4.3.3 Institutional framework and governance

3131. The Government commitments to the Montreal Protocol, the existing set up of the NOU within the Governmental structure and the enacted legislation on licensing of ODS-related activities enforce the sustainability of the outcomes of the R&R project.

8.10.4.3.4 Environmental

3132. The replacement of CFC-based equipment with ozone safe equipment is in progress. Given the closure of production of CFCs globally, the phase out of CFC consumption in Tajikistan is irreversible. The recovery and recycling of CFC-12 refrigerant will discontinue in foreseeable future. The use of HCFC-22 is growing however. Therefore, the recovery and recycling equipment provided under the Project will be in use within the next decade.

8.10.4.4 Catalytic role

3133. The qualification and licensing regulations require that the license applicant obtains the recovery machine. Thus, it is expected that the number of recovery equipment will be growing. The catalytic role of the Project can be assessed also in terms of experience in the implementation of this project by UNDP that was replicated in other geographical areas.

8.10.4.5 Achievement of outputs and activities

8.10.4.5.1 Delivered outputs

3134. All the planned outputs as identified in Table 6 have been achieved. The section on Effectiveness provides detailed account of their quantity, quality and usefulness.

8.10.4.6 Assessment of Monitoring and Evaluation Systems

8.10.4.6.1 M&E design

3135. UNDP delegated the overall monitoring of the project to the NOU in its capacity as a co-ordinator of all activities related to the Montreal Protocol in the country. The NOU was responsible for keeping records of the amounts of ODS recovered and presented for recycling by each service centre. To perform this task, the NOU was provided with resources to recruit a national consultant. The national consultant was required to set up a computer database, to monitor the information received from the service centres, analyze the received data and produce monthly reports for the period of 12 months of the project. The payment of the national consultant was based on 15 working days for the first month and 4 working hours per week for the remaining 11 months. The monitoring of the establishment of R&R system has

been fulfilled by UNDP/UNOPS and the NOU. The implementation of procurement and delivery of the R&R equipment and the training and certification of servicing personnel was implemented by UNDP/UNOPS with assistance from the local UNDP office and NOU. The selection of beneficiaries, distribution of equipment, signing contracts with beneficiaries and operational control and monitoring of R&R activities, and reporting were under the responsibilities of the NOU.

3136. The expected results of the project to be monitored are formulated as follows in the project document:

- Improved training of technicians in the refrigeration and air conditioning sector thereby reducing leaks and emissions during servicing and maintenance;
- The recovery of refrigerant prior to retrofitting, dismantling and scrapping operations;
- Creation of the necessary infrastructure within the country for the collection, recycling and distribution of all recovered cfcs;
- Encouragement service workshops and companies to maintain their own recovery systems and/or equipment, whether directly included in this programme or not; and
- Expected reduction of a minimum of 15.5 ODP tonnes / year of imported CFC-12.

3137. There was no M&E plan as such. The project document contains the timetable with major milestones such as approval of the project by the GEF, procurement and delivery of equipment, conducting demonstration workshops, distribution of equipment, starting recovery and recycling operations, setting up the monitoring system, project review and reporting results. The implementation schedule indicates the time interval (a quarter of the year) as a target for the accomplishment of specific milestones without linkages to specific dates. The timetable is the only monitoring tool to track progress towards achieving project outputs. The ODS reduction is the only measurable indicator that was incorporated in the project document.

3138. The title of ownership of the machines and equipment provided under the Global Environment Facility will be kept by the Government throughout the duration of the project and then transferred to the users. The transfer will be subject to final evaluation of the activities carried out by the individual users. The M&E design envisaged the evaluation of the progress through the evaluation missions of the UNDP consultant and preparation and signing the project completion report by representatives of the MEP, UNDP and NOU.

8.10.4.6.2 M&E plan implementation

3139. The starting point of the implementation of the project was the approval by the GEF that happened to be in December 1999. The implementation of milestone activities experienced delays versus the timetable as follows:

- Delivery of equipment – 12 months ,
- Conducting demonstration workshops – 12 months,
- Distribution of equipment, starting recovery and recycling operations – 9 months;
- Setting up the monitoring system – 15 months,
- Review of the project, reporting results – 6 months.

3140. In October 2002, UNDP organized the evaluation mission of the international expert twelve months following the start of recovery and recycling operations and setting up the monitoring system. The NOU recruited the national consultant who collected data on CFC-12 and HCFC-22 quantities recovered and recycled since 2001. The progress report was prepared in cooperation with the NOU. In May 2003, the tripartite meeting was organised with participation of the Government, UNDP Office of Tajikistan and the NOU. The data were submitted to UNDP as part of the final report on the implementation of the project. As result, the project completion report was prepared and approved. The NOU took the full responsibilities on the operational control, monitoring and reporting of the R&R activities.

3141. From November 2001 to December 2006, the NOU conducted 10 monitoring missions covering all the major regions in the country. The scheduled inspections were crucial for establishing the regular reporting of data on recovered and recycled refrigerant and on the status of R&R

equipment. The delays in provision of IS funds by UNEP in 2003 had a negative impact on organizing R&R monitoring activities. The last set of data is available for 2008. The evaluator was advised that there is lack of spare parts and some tools and equipment are not of good quality (most of leak detectors were out of order within the first year of use).

3142. The M&E design has very limited quantitative performance indicators. The major one was the number of R&R machines to be delivered. The quantities of recovered and recycled ODS, and the cost-effectiveness, were assessed using wrong assumption and proved to be impractical. The following performance indicators could be added providing more enlightening information: 1) the annual utilization rate of recovery and recycling machines is terms of kg of ODS recovered/recycled per machine; 2) the percentage of recovered and reused refrigerants to the total ODS consumption in the refrigeration servicing sector; and 3) the calculated value of avoided imports of new ODS refrigerants in $ terms. The availability of this additional information would be helpful in optimizing the R&R system and making it more efficient.

8.10.4.6.3 Budgeting and Funding for M&E activities

3143. The costs of monitoring of R&R operations have been covered from the IS budget for RMP monitoring. In total $15,000 have been allocated for 200,2001 and 2003. The budget of the project included the cost of the evaluation mission by the international consultant amounting to US $10,000. No specific budget item, however, was allocated for R&R monitoring. Interruptions in flow of funds under the IS project had a negative impact on the monitoring of the R&R project in 2003. The lack of resources under the IS project limited the R&R monitoring inspection to one per year in 2004, 2005 and 2006.

8.10.4.6.4 Long-term Monitoring

3144. The long term monitoring was envisaged by UNDP as the outcome of the R&R project with funding to be provided under the IS extension project supervised by UNEP. UNEP involvement in the monitoring of R&R is nominal. There are very cursory remarks about continuing R&R activities in UNEP PIRs. Delays in provisions of IS funds by UNEP resulted in interruptions of availability of R&R data in 2003. The importance of the long term monitoring of R&R operations requires that this activities are funded under a separate budget item either under R&R project by UNDP or under the IS project by UNEP.

8.10.4.7 Assessment of processes that affected attainment of project results

8.10.4.7.1 Preparation and readiness

3145. The UNDP strategy was to start the implementation of the R&R activities immediately after GEF approval of the project for Tajikistan although certain time required for adoption of the legislation on ODS import licensing and quota system. Without such legislation the success of R&R operations could not be guaranteed. It appears that lessons from previous R&R projects have not been incorporated in the project design. In reality, more time was required for UNDP for preparation, procurement and delivery of equipment. The practical R&R work commenced after the legislation was put in place and, therefore, had its beneficial effect on CFC and alternative price relationship.

3146. The R&R project has the training component while UNEP implemented its separate training project. The curricula of two training programmes contain many similar elements. Both training programmes could be effectively merged and conducted simultaneously bringing savings in resources spent. Such an approach would result in interdependency of two agencies and require more close coordination and partnership. In reality, however, the implementation of the training programme by UNEP experienced serious delays that would have put at risk the success of the R&R component.

8.10.4.7.2 Country commitment

3147. The R&R activities were included in the Country Programme approved by the Government as a tool in achieving ODS phase out targets. It was envisaged that introduction of R&R practices would result in reduction of the demand in imported CFC refrigerants during 2001 to 2003 for servicing the existing refrigeration equipment through the use of recycled refrigerants. It was understood that once CFC imports stopped in 2004, the recycled CFC would be the only

alternative source of CFC-12 refrigerant in the country for maintaining the existing refrigeration equipment. The project design was fully in line with the national plans and Government commitments and contributed towards achievements of Montreal Protocol targets.

3148. The Government provided full support to R&R activities through series of regulations and through effective work of the NOU and national refrigeration experts. The Refrigeration Association played a very important role in dissemination of information, training and collection of R&R data. The NOU took the full responsibility for the long term monitoring of the R&R programme and reporting data.

8.10.4.7.3 Stakeholder involvement

3149. The implementation of the project depended in many ways on the active participation of the Government, NOU, refrigeration industry and Refrigeration Association. The beneficiaries of the R&R programme were outreached by the NOU through awareness campaign and training workshops. Their active participation maintained through conducting monitoring and inspection missions and activities undertaken by the Refrigeration Association.

3150. The regular reporting of R&R data provided the feedback mechanism and ensured the sound involvement of industry participants. On the basis of the feedback information, the NOU assisted in maintenance of R&R equipment providing repair and spare parts and making the redistribution of equipment when it deemed necessary.

8.10.4.7.4 Financial planning

3151. The major portion of the budget was associated with procurement of the R&R equipment that was implemented by UNOPS. The control of expenditures was with the UNDP Montreal Protocol Unit and UNDP GEF Unit. The funding of training workshops was organized through the UNDP local office and the NOU. There was no delay in flow of funds associated with procurement and delivery of equipment and the implementation of the training component. According to UNDP PIR all the funds allocated for R&R project were spent by 2003.

3152. In 2003 and 2004, delays in flow of funds were observed under the IS project implemented by UNEP that had a negative impact on conducting of monitoring of R&R activities by the NOU.

3153. The evaluation of financial accounts and financial audits was not part of the Terms of References for this terminal evaluation.

8.10.4.7.5 UNEP / UNDP Supervision and backstopping

3154. The UNDP organized two missions of the international consultant to Tajikistan: one was for training of R&R operations and monitoring of distribution of the R&R equipment in July 2001; the second one was for the evaluation of the progress in the implementation of the project in October 2002. Both missions were very useful in providing advice and expertise for the NOU and local staff involved in the implementation of the project.

3155. The UNDP registered the R&R project as completed in March 2003. Since then, the long term monitoring of R&R activities was maintained by the NOU without UNDP and UNEP supervision and backstopping.

8.10.4.7.6 Co-financing and Project Outcomes & Sustainability

3156. There was no expected co-financing of the R&R project.

8.10.4.7.7 Delays and Project Outcomes & Sustainability

3157. The delays in the implementation of the project are discussed in Paragraph 137 above. The overall delay in 12 months is identified versus planning milestones reflected in the project time table. These delays, however, did not affected negatively the expected outcomes since the practical R&R work commenced immediately after the adoption of legislation that limited the availability of CFC refrigerant and created favourable economic conditions for R&R operations. The monitoring activities undertaken by the NOU contributed to the sustainability of the project.

3158. Delays in provision of IS funds to the NOU by UNEP caused disruption in monitoring of R&R operations in 2003. The monitoring was resumed after UNEP took correctional measures and restored the flow of funds in 2004.

8.10.4.8 Project ratings

3159. The Recovery and Recycling project is rated according to categories and criteria specified in Annex 1: Terms of Reference of the evaluation. The ratings are presented Table 61.

Table 61: Ratings for the ODS recovery and recycling project in Tajikistan

Criterion	Evaluator's Summary Comments	Rating
Attainment of project objectives and results (overall rating)	Not all the project objectives were attained	**S**
Effectiveness	The following project objectives were successfully attained: (1) Adoption of legislation supporting R&R operations; (2) Establishment of ODS recovery and recycling system in the refrigeration and air-conditioning sector; (3). Recovered and recycled ODS contributed to attaining the ODS phase out targets. The target of phase out of 15.5 ODP tonnes of CFCs through R&R operations was not achieved. The target was highly overestimated. The maximum quantities of CFC-12 were recovered in 2008 to be 11.7 ODP tonnes.	**S**
Relevance	All project outcomes are fully consistent with GEF strategy in ozone and climate focal areas. The objectives of the R&R project are incorporated into the Country Programme approved by the Government.	**HS**
Efficiency	gh the planned cost-effectiveness was not achieved, the efficiency of the project in terms of actual cost-effectiveness ($25.2/kg ODP), the total recovered ODS quantity per each recovering machines (456 kg) and the calculated value of avoided imports of new refrigerants ($0.99 million) makes the project highly efficient.	**S**
Sustainability of Project outcomes (overall rating)	Long-term outcomes and impact of R&R project continued after the project funding ended in 2003.	**L**
Financial	The recovery and recycling operations appear to be economically viable and sustainable.	**L**
Socio Political	There is no socio-political risk to the sustainability of the R&R project. The stakeholder ownership ensures the sustainability of outcomes/benefits of the project.	**L**
Institutional framework and governance	The Government commitments to the Montreal Protocol, the existing set up of the NOU within the Governmental structure and the enacted legislation on licensing of ODS-related activities enforce	**L**

Criterion	Evaluator's Summary Comments	Rating
	the sustainability of the outcomes of the R&R project.	
Environmental	The replacement of CFC-based equipment with ozone safe equipment is in progress. Given the closure of production of CFCs globally, the phase out of CFC consumption in Tajikistan is irreversible. The recovery and recycling of CFC-12 refrigerant will discontinue in foreseeable future. The use of HCFC-22 is growing however. Therefore, the recovery and recycling equipment provided under the Project will be in use within the next decade.	**L**
Achievement of outputs and activities	The major outputs and activities have been accomplished.	**S**
Monitoring and Evaluation (overall rating)	The UNDP monitoring system pursued short terms objectives. M&E system does not appear to be fully adequate to measure the level of success of the R&R programme.	**MS**
M&E Design	UNDP M&E design of the project covered only short-term objectives of installation of R&R system. The monitoring of outcomes was assigned to the NOU as part of the UNEP IS project with funding from RMP monitoring budget line. Monitoring of R&R activities was practically out of attention by UNEP. The M&E design is lacking a number of quantitative performance indicators that would help to optimize the R&R system and enhance its efficiency.	**MU**
M&E Plan Implementation (use for adaptive management)	The installation of the R&R system was monitored by the UNDP Montreal Protocol Unit in accordance with the project time table. The 12 months delay in the start of R&R operations occurred due to impediments in procurement and delivery of equipment. UNDP carried out a final evaluation mission a year after the distribution of R&R equipment. The NOU has been continuously monitoring the R&R progress since its start with some interruptions in 2003 without specific funding.	**MS**
Budgeting and Funding for M&E activities	The funding of M&E of R&R activities is covered by RMP monitoring budget line in IS project budget. Funding of the final evaluation mission of the international consultant was covered from the R&R project. Delays in IS funds flow caused interruptions in monitoring by the NOU.	**MS**
Catalytic Role	The qualification and licensing regulations stimulate the purchase of recovery	**No ratings are**

Criterion	Evaluator's Summary Comments	Rating
	equipment by servicing personnel.	**requested for the catalytic role**
Preparation and readiness	The R&R activities were part of the country programme that had a high political profile. The execution of the project benefited from high level of Government commitments. The R&R project had the training component while UNEP implemented its own separate training project. The curricula of two training programmes contain many similar elements. Both training programmes could be effectively merged and conducted simultaneously bringing savings in resources spent.	**S**
Country ownership /motivation	The Government demonstrated the high level of commitments and ownership in supporting R&R activities.	**HS**
Stakeholders involvement	The project involved all relevant stakeholders in project preparation and execution.	**HS**
Financial planning	The project had moderate shortcomings in flow of funds that had some negative impact on monitoring activities.	**MS**
UNDP Supervision and backstopping	In general, UNDP fulfilled its role of the supervisory agency. The NOU experienced short term difficulties in carrying out its monitoring functions due to delays in funds flow from UNEP.	**MS**
Overall Rating	All the objectives of the project were met with minor shortcomings.	**S**

8.10.5 TAJ/00G36 – Complete phase out of CFCs in manufacturing of domestic refrigerators at Pamir (UNDP/UNOPS);

8.10.5.1 Background

3160. "Pamir" was established in 1964 as a domestic refrigerator manufacturing company with the manufacturing capacity of 176,000 units per year. For the period 1964 to 1998, the total output was about 3.6 million domestic refrigerators that was sold internally and partially exported. The average annual production was about 100,000 units during this period. In 1991 and 1992, "Pamir" used CFC-11 as the foaming blowing agent, but had to discontinue the use of polyurethane insulation after the civil war in 1993 due to equipment damage and lack of funds to purchase the foam components. Since then, the mineral wool was used as the insulation material that intrinsically has much inferior insulation performance. In 1995 production was virtually stopped because of the civil war and since then, production was about 1,500 units a year (Figure 42).

3161. "Pamir" was an important manufacturer of domestic appliances in Tajikistan that consumed notable quantities of controlled ODS. The conversion of Pamir to non-ODS technology was included in the Country Programme as a priority. By the time of the formulation and approval of the conversion project in 2000, CFC-11 was not used for a number of years, and therefore, the foam component was not included by UNDP into the GEF funding package. Funding of $171,072

was provided to replace the use of 8.61 ODP-tonnes per year of CFC-12 with HFC-134a refrigerant in the manufacture of domestic refrigerators. The funds were provided to change the existing production lines, and for technology transfer, technical assistance, re-design, testing, pre-production trials and training. Incremental operational costs (IOC) were assessed to be $173,956 on the basis of 6 months of 1998 annual production (70,087 units). The assessed IOC were not requested but presented as in-kind co-finance by the enterprise.

8.10.5.2 Attainment of objectives and planned results

8.10.5.2.1 Objectives, outputs, outcomes and performance indicators

3162. The objectives of the Project are reflected in the Country Programme to convert Pamir manufacturing facility to ODS free technology contributing to phase out of national ODS consumption. The outputs and planned activities are contained in the project implementation schedule. In the absence of the logframe for the evaluation of the Project, outcomes and performance indicators were inferred from the outputs/deliverables contained in the UNDP project document (Table 62).

Table 62: Phase out of CFCs in manufacturing of domestic refrigerators at Pamir: Objectives/ Intended Results - Outputs/Deliverables - Outcomes/Performance indicators

Objectives/Intended Results	Outputs/Deliverables	Outcomes/Performance indicators
1.The elimination of the use of CFCs in the manufacture of domestic refrigerators at Pamir to meet the Montreal Protocol CFC phase out targets 2. The establishment of ODS-free domestic refrigerator manufacturing capacity in Tajikistan.	1. Conversion of the refrigerant production line at Pamir from the use of CFC-12 to HFC-134a refrigerant Deliverables: Procurement; Delivery of new production equipment to the country; Installation of new production equipment;; Start up; Training of personnel; Re-design, prototyping, testing; Pilot scale production of new product; Test trials; Certification;	1. The phase out of 8.61 ODP tonnes in manufacturing domestic refrigeration appliances to meet the national obligations under the Montreal Protocol. • The ODS-free production equipment is installed and commissioned; • The manufacturing of ODS-free product is started; 2. Irreversibility of conversion • CFC-based production equipment is destroyed or rendered unusable; • The ban on imports of CFC-based refrigerators is introduced; 3. To maintain the production of domestic refrigerators based on alternative ODS – free technology avoiding the economic and social disruption after the conversion. • The new product is competitive on the local

Objectives/Intended Results	Outputs/Deliverables	Outcomes/Performance indicators
		market; • The output after the conversion is comparable or higher than the production before conversion.

8.10.5.2.2 Effectiveness

3163. By the time of project formulation, the HFC 134a refrigerant was universally accepted as a replacement for CFC 12 in the manufacture of domestic refrigerators and freezers. HFC 134a was widely available and the technology was mature, having already been introduced commercially in many developed countries. Replacement of CFC 12 with HFC 134a required relatively modest changes to existing production facilities. The enterprise did not have any formal technology transfer agreements. The necessary technical assistance was obtained from their compressor suppliers. Assistance was also provided by UNDP/UNOPS consultants. Provision for this was made within the project budget.

3164. The conversion to HFC 134a involved the use of specific compressors and the associated new synthetic lubricants, re-design of the refrigeration systems to cater for the difference in thermodynamic performance of HFC 134a versus CFC 12, prototyping, testing and optimisation of each refrigerator model. The different properties of HFC 134a and the need to avoid cross-contamination with CFC 12 required installation of new system evacuation, refrigerant charging, and leak detection equipment. All the necessary production equipment have been procured, delivered by UNOPS and installed at the plant site with assistance from the international consultant.

3165. The conversion resulted in changes in manufacturing procedures that necessitated training of production line supervisors and operators. The pilot scale manufacture and testing were undertaken by the enterprise for each model preceding full scale HFC-134a-based production. The conversion of the refrigerant line to HFC-134a alternative was accomplished by UNDP/UNOPS and the production of HFC-134a refrigerators started in September 2001. In December 2002, the representative of UNDP/UNOPS and the management of “Pamir” signed the Certificate of Completion of the project and Declaration of Disposal of CFC baseline equipment. All the CFC- based production equipment was destroyed or rendered unusable on 15 December 2002. Thus, the conversion from CFC-12 to HFC-134a was made irreversible. From 2001 to 2006, the enterprise manufactured 6,663 units of domestic refrigeration appliances using HFC-134a refrigerant and rock wool insulation. The change in production and use of refrigerants are shown in Figure 42 using data provided by the NOU.

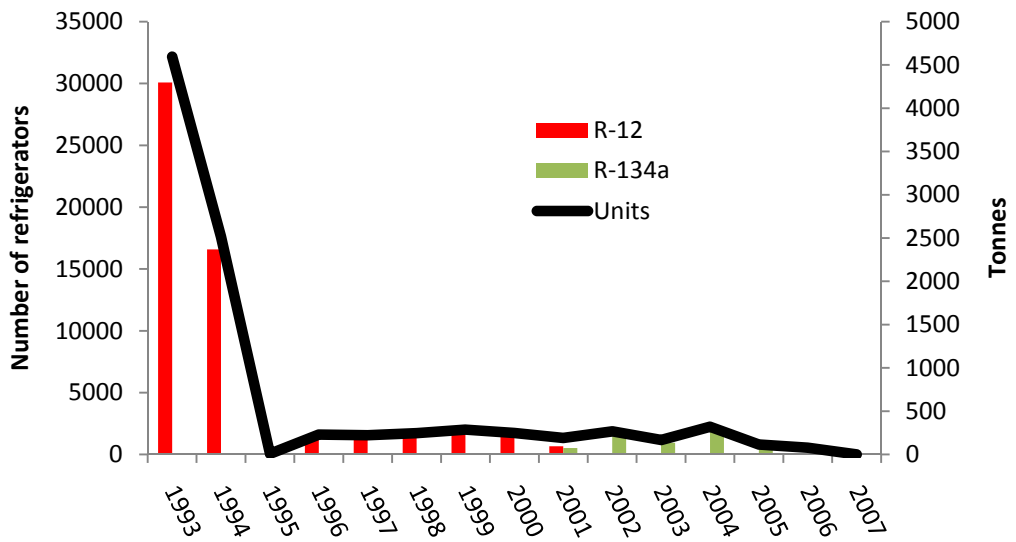


Figure 42: Production of domestic refrigerators at Pamir, with the replacement of CFC-12 by HFC-134a refrigerant

3166. In 2001, the new evacuation and charging line based on isobutane refrigerant was installed with assistance from the Government of Switzerland. The use of isobutane required new refrigerator design, including safety features and new specialized compressors. However, the development of new isobutane-based models did not occur.

3167. UNDP did not conduct the verification of the financial and economic viability of company. It was anticipated that the management of the enterprise and the Government would take the necessary steps for further modernization of production lines in "Pamir", including the installation of cyclopentane based foaming equipment using external sources of capital. These expectations did not materialize.

3168. "Pamir" products could not compete with imported refrigerators available at the market in Tajikistan because of high energy consumption and outdated design. The production and energy costs were also very high because of old and worn out equipment. The production was stopped in 2006. The enterprise went bankrupt. Most of the production equipment was dismantled and sold as scrap. Some of the equipment provided under the project is stored in the warehouse. The evaluator was allowed access to the warehouse to take photographs of the equipment.

3169. In 2001 to 2006 cumulatively, Tajikistan phased out approximately 0.9 ODP-tonnes of CFC-12 through the implementation of the investment project at "Pamir" contributing to Government efforts to meet Montreal Protocol targets. Thus, the expected outcome was attained albeit at much lower level. From socio-economic prospective, the planned outcomes were not attained: the new Pamir product was not competitive and production could not reach an economically sustainable level. The project was not successful since the enterprise ceased to exist shortly after the project was completed (Figure 43 and Figure 44).

Figure 43: Assembly workshop at Pamir in March 2009

8.10.5.2.3 Relevance

3170. The project outcome related to CFC phase out is consistent with the Government strategy and priorities. The outcomes of the project, however, are very modest in terms of ODS phase out.

8.10.5.2.4 Efficiency

3171. The implementation of project was ongoing in accordance with the time table developed in the project document. The international bidding, selection of supplier, procurement and delivery was accomplishment within 12 months since the date of approval of the grant. Another six months was required for customs clearance, installation of equipment and start up. Within 18 months the enterprise was able to start manufacturing of non-CFC product. The UNDP/UNOPS managed to meet their commitments timely and without delays. However, "Pamir" products could not compete with imported refrigerators available at the market in Tajikistan because of high energy consumption and outdated design. The production and energy costs were also very high because of old and worn out equipment. The production was stopped in 2006.

3172. The cost-effectiveness of GEF grant was reflected in the project document amounting to $18.4/kg ODP phased out. This cost-effectiveness was calculated on the basis of CFC-12 consumption of 8.6 ODP tonnes presumably consumed for production of 70,087 units in 1998. According to data provided to evaluators by the NOU, the actual production at Pamir for three last years preceding the conversion was 1,720, 2,011 and 1,730 units with CFC-12 consumption 0.23, 0.27 and 0.23 ODP tonnes in 1998, 1999 and 2000 respectively. The actual cost-effectiveness of the GEF grant would be $704/ kg ODP based on average 3 year CFC-12 consumption. The cost-effectiveness threshold for conversion of domestic refrigeration manufacturing facilities was established at $13.6/kg ODP by the MLF Executive Committee. The Pamir cost-effectiveness is about 50 fold poorer than the MLF threshold. Such a poor cost-effectiveness was associated with very low production. If the actual production level and cost-effectiveness were reflected in the UNDP project proposal the justification for the approval of the project would most likely be questioned during the GEF review process. As conceived, the project was highly ineffective.

Figure 44: Dismantled Galileo charging equipment at the Pamir facility

8.10.5.3 Assessment of Sustainability of project outcomes

8.10.5.3.1 Financial resources

3173. The financial resources provided by GEF covered the partial conversion of the enterprise addressing the assembly line related to the refrigerant. The other important part of the production process related to the insulation of cabinets and doors was outdated and remained unaddressed because of eligibility issue. It was anticipated that additional investments would be sought by the enterprise from other sources. Once the conversion was finished, the NOU and the management of the enterprise tried to raise additional funding from GEF and bilateral donors to establish a modern insulation technology but failed. The economic viability of the enterprise and risks to sustainability of the project have not been realistically considered by UNDP during the project formulation.

3174. The co-financing by the enterprises was presented as in-kind contribution expressed in incremental operating costs (IOC) for six months duration. This co-financing was calculated to be $173,956 on the basis of 1998 annual production (70,087 units). If the actual average 1998-2000 production is used for the calculation of IOC the co-financing would not exceed $4,500.

8.10.5.3.2 Socio-political

3175. The conversion of Pamir was a priority project for the Government. However, the economic viability and sustainability of the enterprise was beyond the control of the Government once the plant was privatized. The economic hardship in the country did not allow the Government to

8.10.5.3.3 Institutional framework and governance

3176. The NOU provided the necessary support to the management of the enterprise during the implementation of the conversion. The NOU was also actively involved trying to obtain additional resources interacting with UNDP Headquarters. Unfortunately all these attempts did not bring positive results.

8.10.5.3.4 Environmental

3177. The conversion to HFC-134a refrigerant was proved to be irreversible. This conversion, however, had a little impact on the local market of refrigeration appliances because of "Pamir" low production (see Figure 42). At the time of the implementation of the project, most of imported appliances were non-CFC based since all major international producers stopped the manufacturing of CFC-12-based product. In 2006, the Government adopted legislation regulating imports of ODS containing equipment. Currently, the major risk is associated with illegal imports of CFC-12 for servicing old appliances still available in Tajikistan.

8.10.5.4 Catalytic role

3178. Pamir was the only manufacturer of domestic refrigerators in Tajikistan. No replication or catalytic effect of the Pamir project is expected for the ODS phase out programme in the country. For UNDP, however, the experience of Pamir conversion can be very useful.

8.10.5.5 Achievement of outputs and activities

3179. All the outputs identified in the project (procurement, delivery and installation of new production equipment, start up, training, re-design, prototyping, testing, pilot scale production of new product, test trials, certification) have been delivered in time following the implementation schedule. In support of the conversion of "Pamir" production lines, the Government adopted legislation regulating imports of ODS-based refrigeration and air-conditioning equipment.

8.10.5.6 Assessment of Monitoring and Evaluation Systems

8.10.5.6.1 M&E design

3180. The project document contains the time table reflecting the timing of all major steps of conversion. The project design envisaged the monitoring of the implementation by backstopping officers in UNOPS and UNDP Montreal Protocol Unit. The international consultant was assigned to develop the conversion plan that was agreed with the management of the enterprise. The implementation of the plan was supervised by the same international consultant. The project envisaged also a mission of a UNOPS consultant to make the final evaluation and sign the Certificate of Completion, including the Declaration of Disposal of CFC baseline equipment.

8.10.5.6.2 M&E plan implementation

3181. Monitoring consisted of comparing planned versus actual implementation for each of the phases, and noting the delay that resulted. According to the project implementation time table the start up production of alternative products was scheduled in 18 months after the approval of the GEF grant. The delivery of the production equipment took more time due to delays with customs clearing. However, it did not prevent from adhering to the deadline for start up production. The enterprise commenced production of HFC-134a appliances in 18 months after the date of approval of the project (December 1999).

3182. The international consultant visited the project site three times at key points in time providing the necessary expertise in planning, installation of production equipment, testing and prototyping, and evaluation of results after a year of continuous production. Additionally, another UNOPS consultant conducted the certification of the completion of conversion in December 2002. The tri-partite protocol on the completion of the project was signed by representatives of the Government, the NOU and the local UNDP office in June 2003.

8.10.5.6.3 Budgeting and Funding for M&E activities

3183. The executing agency fee of $12,672 was the source of UNDP/UNOPS expenditures associated with monitoring of the implementation schedule by backstopping officers. The monitoring and supervisory activities related to the conversion have been financed from the budget item Technology Transfer/ Technical Advisory Services amounting to $20,000. The final evaluation was funded from allocation of $5,000 included in the project budget. All these resources were made readily available in a timely fashion.

8.10.5.6.4 Long-term Monitoring

3184. The long term monitoring was not envisaged in the project. The responsibilities of executing agencies came to an end upon signing the certificate of completion. The NOU continued to monitor the situation at the plant until its closure in 2006.

8.10.5.7 Assessment of processes that affected attainment of project results

8.10.5.7.1 Preparation and readiness

3185. In 2001, the conversion of manufacturing domestic refrigeration appliances from CFC12 to HFC-134a refrigerant was widespread and proven in many projects implemented by UNDP in Article 5 countries. The "Pamir" project objectives and components replicated in a large extent other similar projects implemented by UNDP and considered as practical and feasible. The implementation mechanism relied upon the experience of UNOPS as an executing agency that was earlier involved in the implementation of related projects in cooperation with UNDP. The preparatory stage required involvement of the enterprise to finish all the construction and electrical work in time to proceed with installation of the production equipment. The project management and supervision followed established UNDP and UNOPS guidelines. The project was implemented according to established time schedule.

3186. The drawbacks of the project are associated with inaccurate representation of the actual capacity utilization of the plant and the production level prevailed in years immediately preceded the conversion (See Figure 42). According to the NOU, the 1998 production was by an order of magnitude lower than reported in the project proposal. Consequently, the expected cost-effectiveness in terms of US$/kg ODP phased out was also grossly misrepresented. Once the actual production and ODS consumption were stated in the proposal the decision on financing this project might be different.

3187. The low production in three years preceding the conversion was an apparent indicator of problems in existing and future economic viability of the plant and competitiveness of its product. Then existing design of "Pamir" refrigerators with glass wool insulation was inherently outdated, energy inefficient and, therefore, uncompetitive. The information contained in the project document is very brief: "During the war 1992-93 PAMIR ceased usage of PU rigid foam as cabinet and door insulation material. Presently glass wool is used as an insulation material for the cabinets and doors." The project document provided no information on how the enterprise was going to improve the design using more efficient polyurethane insulation.

8.10.5.7.2 Country commitment

3188. The Government considered Pamir conversion as a priority project and provided its support by facilitating the customs clearance and waving taxes on imported production equipment. The NOU provided all the necessary organizational support to international consultants and the management of the enterprise during the implementation of the project. The Government was aware of problems with the existing outdated design and competitiveness of Pamir product and reflected its concerns in the Protocol of the Tri-Partite Meeting on completion of the project. The Government was not able, however, to provide the necessary financial assistance to the enterprise due to lack of free capital and more urgent priorities.

8.10.5.7.3 Stakeholder involvement

3189. The project involved directly the management of the enterprise at each step of its implementation as well as the NOU. The NOU tried to assist the enterprise in obtaining the financing for conversion of the foam insulation production line through UNDP and bilateral

donors. These attempts did not materialize.

8.10.5.7.4 Financial planning

3190. The budget covered all the necessary equipment and activities associated with conversion of the refrigerant production line to replace CFC-12 with HFC-134a alternative. The planning and management of the project ensured the proper flow of funds. The conversion was accomplished according to the established time table. The enterprise received funding amounting to $131,372 in addition to the GEF grant from bi-lateral sources for installation of isobutane refrigerant charging line equipped with the necessary safety features. Isobutane refrigerant, however, was never used in production of "Pamir" appliances.

3191. The investment project apart from achieving apparent ODS phase out needs to be considered from financial and economic point of view i.e. as a long term commitment of economic resources with the objective of producing and obtaining net gains in the future. In case of Pamir conversion, UNDP would have to be alerted with the poor financial situation of the enterprise. The project design contains no financial and economic analysis and investment appraisal. It appears that UNDP missed this important step in its financial planning of the Pamir conversion.

3192. UNDP did not follow the MLF guidelines when formulating the Pamir investment project. If they had been followed, the grant would have been so low that the proposal would not have been approved and GEF resources could be used for much more efficient projects.

3193. The evaluators had no access to financial documentation to verify the breakdown of final actual project costs.

8.10.5.7.5 UNEP / UNDP Supervision and backstopping

3194. The role of UNDP and UNOPS in supervising and backstopping of the project was described above.

8.10.5.7.6 Co-financing and Project Outcomes & Sustainability

3195. The management of the enterprise had an intention to improve the design of its appliances and modernize the manufacturing process to make its product more competitive. However, all the attempts to raise necessary funds were not successful. The enterprise went bankrupt and was closed in 2006.

8.10.5.7.7 Delays and Project Outcomes & Sustainability

3196. There were no delays in the implementation of the project. The lack of the sustainability of the project is related to external circumstances. The ratings for the domestic refrigerator project are shown in Table 63.

Table 63: Ratings for the domestic refrigerator project in Tajikistan

Criterion	Evaluator's Summary Comments	Rating
Attainment of project objectives and results	The project had significant shortcomings in the achievement of its objectives.	**MU**
Effectiveness	In 2001 to 2006 cumulatively, Tajikistan phased out approximately 0.9 ODP-tonnes of CFC-12 through the implementation of the investment project at "Pamir" against the target of 8.6 ODP phase out a year. The expected outcome was not attained. From socio-economic prospective, the project was not successful since the enterprise ceased to exist shortly after the project was completed.	**MU**

Criterion	Evaluator's Summary Comments	Rating
Relevance	All project outcomes are not fully consistent with GEF strategy in ozone focal area in terms of its cost-effectiveness. The objectives of the Pamir conversion project are incorporated into the Country Programme as a priority project but not materialized.	**MU**
Efficiency	The ODP phase out claimed in the project was grossly inconsistent with actual ODS consumption by the enterprise. Therefore, the actual cost-effectiveness was 50 fold poorer than MLF threshold.	**MU**
Sustainability of Project outcomes (overall rating)	In overall, the project cannot be recognized as sustainable.	**U**
Financial	The project did not prove to be economically viable and sustainable.	**U**
Socio Political	The management of the enterprise could not overcome serious economic and technological problems despite GEF investment into conversion of the refrigerant production line. The plant went bankrupt in 2006 and many jobs were lost.	**U**
Institutional framework and governance	The conversion of Pamir was a priority project for the Government. The economic hardship in the country did not allow the Government to support financially the enterprise to continue its modernization	**MU**
Environmental	The conversion of Pamir to HFC-134a refrigerant had a little impact on the local market of refrigeration appliances because of low production. Currently, there is no risk of incoming of CFC-12 based appliances since their production is stopped worldwide.	**L**
Achievement of outputs and activities	The planned outputs and activities have been accomplished.	**S**
Monitoring and Evaluation (overall rating)	The M&E activities were implemented in a satisfactory way.	**S**
M&E Design	The project design envisaged the monitoring of the implementation by backstopping officers in UNOPS and UNDP Montreal Protocol Unit. The operational supervision of the implementation and certification were assigned to international consultants.	**S**
M&E Plan Implementation (use for adaptive management)	The M&E plan as designed was implemented at a satisfactory level with assistance from the NOU and international consultants.	**S**
Budgeting and Funding for	The budget had adequate resources to	**S**

Criterion	Evaluator's Summary Comments	Rating
M&E activities	support monitoring and evaluation activities by UNDP/UNOPS staff and international consultants.	
Catalytic Role	No catalytic effect was observed since Pamir was the only manufacturer of domestic appliances in Tajikistan. UNDP gained experience that might be useful in implementation of similar projects elsewhere.	No ratings are requested for the catalytic role.
Preparation and readiness	The Pamir project objectives and components replicated in a large extent other similar projects implemented by UNDP /UNOPS. The implementation mechanism relied upon the experience of UNOPS as an executing agency. It appears that production, expected ODP phase out and cost-effectiveness were misrepresented in the project document. The project document provides inadequate information on unstable economic situation of the plant and outdated design of its product.	**MU**
Country ownership / driveness	The Government attached a great priority to the project but was unable to provide financial assistance required for further modernization of the plant.	**MS**
Stakeholders involvement	The project involved all relevant stakeholders in project preparation and execution.	**S**
Financial planning	The budget covered all the necessary equipment and activities associated with conversion of the refrigerant production line to replace CFC-12 with HFC-134a alternative. The planning and management of the project ensured the proper flow of funds. UNDP did not follow the MLD guidelines when formulating the Pamir investment project. No financial provisions were allocated for conducting the financial and economic analysis and investment appraisal.	**MU**
UNEP Supervision and backstopping	UNDP and UNOPS fulfilled their supervisory and backstopping responsibilities.	**S**
Overall Rating	Not all the objectives of the project were met.	**MS**

11 Turkmenistan

8.11.1 Background

3197. Turkmenistan became independent from the Soviet Union in 1991. Immediately after independence, the country experienced several years of economic decline caused by the break-up of traditional economic ties with the Soviet Union, poor harvests and mismanagement of its energy exports. Virtually all of Turkmenistan's natural gas exports were suspended in 1997 because of payment difficulties, which was particularly damaging to the economy. By 1998, however, the economy began to recover and even accelerated when natural gas exports to Ukraine and Russia resumed in 1999 and 2000. The GDP was estimated to be 6% in 2006[544].

3198. Turkmenistan acceded to the Vienna Convention and the Montreal Protocol in 1993; the London Amendment in 1994; and the Copenhagen, Montreal and Beijing Amendments in 2008. As a Party to the London Amendment, Turkmenistan's consumption of CFCs should have been zero by 1996, but instead it was reported as 29.6 ODP-tonnes. The bulk of CFC consumption in Turkmenistan was used for refrigeration, which played an important role in the nation's economy. In 1999, after a meeting with the Protocol's Implementation Committee, the Parties to the Protocol encapsulated Turkmenistan's commitment to a phase-out plan with interim benchmarks in a Decision[545] that aimed to:

- Not exceed imports of 22 ODP-tonnes in 1999;
- Implement an import/export licensing system by 1 January 2000;
- Ban the import of equipment using and containing ODS by 1 January 2000;
- Establish an effective system for monitoring and controlling ODS trade by January 2000;
- Complete recovery & recycling and training projects by 1 July 2001;
- Establish import quotas for CFCs not exceeding 22, 15, 10, 6 and 0 ODP-tonnes by 1 January each year from 1999 to 2003 respectively;
- Ban imports of Annex B substances by 1 January 2003;
- Complete the GEF project by 1 January 2003.

3199. The Parties noted that in 1999 the GEF was already providing financing assistance to Turkmenistan to phase out its consumption of ODS.

3200. The Country Programme (CP) was prepared and approved by Turkmenistan in July 1998, with the assistance of UNDP and UNEP and financial assistance from the GEF of $16,000. At that time, CFC consumption in Turkmenistan was 25.3 ODP-tonnes, instead of zero.

3201. The Refrigerant Management Plan (RMP) was developed as a strategic tool to enable the reduction and subsequent phase out of ODS consumption for refrigeration in a coordinated, planned and cost effective way. The major elements of the RMP included appropriate and adequate training of servicing technicians in the environmentally-safe handling of refrigerants, legislation on ODS, retrofitting of existing equipment, and the recovery and recycling of ODS refrigerants. The RMP should be accompanied with a policy framework consisting of regulations of ODS imports, certification of servicing personnel and introduction of a system of economic incentives/disincentives. The RMP established an optimal time sequence that integrated all the

[544] IMF. The official government statistics show 21.4% growth in 2006, but these estimates are unreliable.
[545] Decision XI/25: Compliance with the Montreal Protocol by Turkmenistan

activities.

3202. In the light of the CP and RMP, the GEF Council approved $399,220 for the ODS phase-out Project for Turkmenistan. The Government contribution was estimated to be $22,800. The project was designed to assist Turkmenistan in meeting its phase-out obligations under the Montreal Protocol and other commitments outlined in Decision XI/25 and ensure availability of technical assistance to expedite the implementation of the CP. The Project comprised three sub-projects: 1) Institutional Strengthening and Customs training that provided resources to the Ministry of Environmental Protection for strengthening the national institutional structure and monitoring the ODS phase-out activities for a period of three years. These two sub-projects were implemented by UNEP. 2) Training the Trainers and Refrigeration Technicians that aimed to provide training to refrigeration servicing personnel; 3) _Recovery and Recycling (R&R) of ODS refrigerants. This subproject was implemented by UNDP/UNOPS. The overall success of the R&R programme hinged upon the successful implementation of the two other sub-projects.

3203. The sub-projects that contributed to the ODS phase-out in Turkmenistan that have been completed are shown in Table 64.

Table 64: Sub-projects that contributed to the ODS phase-out in Turkmenistan that have been completed

Project index	Programme	Executing Agency	ODS phase-out (ODP-tonnes)	GEF budget* ($)	Co-finance ($)
GF/2110-99-07	Institutional Strengthening and Capacity Building – Establishment of an Ozone Office and Training for Customs Officers	UNEP	NA	153,793	22,800
GF/4040-01-15	Training of trainers for use of ODS-free refrigerants in maintenance and service	UNEP	6.53	105,655	
TUK/98/G35	National programme for recovery and recycling of ODS refrigerants, including Monitoring of RMP Activities	UNDP/ UNOPS	7.53	139,772	
	Total		**14.06**	**399,220**	**22.800**

* Including agency support cost

3204. The field visit of the evaluator to the country was conducted in March 2009. By the time of the evaluation, all three sub-projects have been physically completed. The evaluator obtained comprehensive information from field visits to project sites and interviews with Government officials, NOU, enterprise management and individual entrepreneurs involved. Information available in project documents and the NOU website was also used in this evaluation.

3205. The design of the UNEP and UNDP sub-projects did not require clearly defined logframes and prior agreed performance indicators (PIs) at the time of their formulation and approval. The Project Brief prepared for the GEF Secretariat contains one page log frame matrix that shows objectively verifiable indicators, means of verification and critical assumptions and risks. These evaluation parameters, however, are pertinent to the project as a whole, not to individual sub-projects and not detailed enough. Therefore, it has been necessary to retrospectively formulate some of project outputs and outcomes, and PIs based on objectives of individual sub-projects and outputs and implemented activities.

8.11.2 *GF/2110-99-07 - Institutional Strengthening and Capacity Building – Establishment of an Ozone Office and Training for Customs Officers*

8.11.2.1 Objectives/Goals

3206. The main objective of this sub-project is to strengthen the national institutional structure for the efficient and effective coordination and management of activities outlined in the Country Program and the Refrigerant Management Plan (RMP). More specifically, the project seeks to: 1) to provide resources for the establishment of a National Ozone Unit within the Ministry of Environment Protection; 2) to facilitate the adoption of a legal and regulatory system that ensure the compliance with MP obligations; 3) to raise the general public awareness about the Montreal Protocol and ODS phase; 4) to coordinate implementation of UNDP/UNOPS recovery and recycling sub-project adopting ODS containment practices; 6) to enable the collection of the required data on ODS use and consumption and reporting to the Ozone Secretariat and IAs; 7) to provide the Customs Department with ODS detection equipment to enable identification of ODS imported in bulk quantities and in equipment and conduct hands-on training for selected customs officials.

8.11.2.2 Performance indicators

3207. The IS project document in Turkmenistan contains the general and specific objectives but not sufficient and relevant performance indicators that could be served for the purpose of this evaluation. The objectives and outputs for the evaluation of the institutional strengthening sub-project were inferred from the detailed overall project description, UNEP PIRs and other available information and assessed as commensurate to real outcomes with relevant performance indicators as shown in Table 65.

Table 65: Turkmenistan Objectives/ Intended Results - Outputs/Activities/Deliverables - Outcomes/Performance indicators

Objectives/Intended Results	Outputs/Activities/Deliverables	Outcomes/Performance indicators
1. Strengthening of the national capacity to effectively coordinate and administer the actions outlined in CP and RMP	1. Establishing NOU and initiating actions that created a suitable climate in the country for the expeditious phase-out Time required to UNEP to disburse the first funding tranche; Timely recruitment of sufficient and qualified NOU staff; Timely establishment of adequate NOU infrastructure; Provision of the counterpart funding;	1. Evidence of strengthened institutional capacity and improved coordination among stakeholders. • Continuity of NOU staff and operation; • Establishment of the Interagency Committee; • Approval of the Action Plan; • Access of NOU staff to decision makers; 2. Adequate political priority assigned by the Government to environmental issues and the MP in particular • Position of the NOU Head in the Governmental hierarchy;
2. The facilitation of ODS phase-out by adoption of a legal regulatory system	3 Development and promotion of legislative acts and regulations on control of ODS ;	2. Introduction of legal acts regulating imports and use of ODS, and their enforcement.

Objectives/Intended Results	Outputs/Activities/Deliverables	Outcomes/Performance indicators
		• Ratification of MP Amendments; • Adoption of legislation on ODS import/export licensing system in 2002 ; • Establishment of ODS import quota system; • Register of authorized importers; • Introduction of ban on trade of ODS and equipment containing ODS; • Adoption of qualification requirements in refrigeration servicing; • Adoption of legislation that mandates 3R activities; • Introduction of appropriate tax incentives to facilitate use of alternative substances; • Changes of market price relations between CFCs and substitutes.
3. Availability of trained custom officers to ensure the control of ODS movement across country borders	4. Establishing training centres; 5. Development and translation of a training manual; 6. Conducting a training workshop for trainers with participation of higher level officials from customs and other government departments (Phase 1); 7. Conducting the training programme on application of the licensing system and ODS identifiers for customs officers at border checking points(Phase 2); 8. Procurement and distribution of ODS identifiers;	3. Enforcement of ODS import licensing and quota system through training of customs officers. 4. Reduction in illegal trade of ODS. 5. Improvement in ODS data collection resulting from the raised awareness about ODS import licensing and quota system among higher level officials from customs and other government departments; • Number of customs training courses conducted and officers trained; • Continuity (follow-up, refreshment) of training activities; • Availability of curricula

Objectives/Intended Results	les	Outcomes/Performance indicators
		and material used in customs training; • Adequate number of ODS identifiers supplied; • Effective use of identifiers; • Availability of computerized customs data system; • Evidences of enforcement of legislation through training of customs officers;
4. The facilitation of support and coordination of local industry and technical institutions in adopting ODS-free substitute technologies and monitoring of the CP and RMP	9. Effective interaction with governmental institutions and agencies; 11. Increased cooperation with business sector and professional associations; 12. Assistance in coordination and monitoring of implementation of two UNEP training components and UNDP recovery and recycling sub-project 13. Coordination in provision of modern tools and equipment to servicing workshops in domestic, commercial refrigeration and A/C sector; 14. Assistance in the preparation of budgets and advice on the release of funds from the GEF;	6. Improved coordination and monitoring in implementation of the CP and RMP. • Evidences of access of NOU to and interaction with decision makers, steering committees or inter-ministerial bodies; • Involvement of private sector stakeholders; • Establishment and support of the Refrigeration Association; • Successful completion of training of custom officers together with UNEP; • Successful completion of training in good refrigeration servicing practices together with UNEP; • Number of R&R and servicing kits provided to refrigeration servicing enterprises.
7. Raising awareness of the general public, local industry, technical institutions and the Customs on the ODS phase out, the existence of ODS-free technologies and the need to control consumption and movement of ODS in the country.	15. Conducting awareness workshops for central and regional governmental officials, environmental inspectors and customs officers on ozone layer and MP issues; 16. TV and radio interviews on ozone layer protection	7. Improved communication with and effective engagement of governmental and non-governmental institutions, professional organizations, private sector and general public in ODS phase out activities.

Objectives/Intended Results	Outputs/Activities/Deliverables	Outcomes/Performance indicators
	issues; 17. Dissemination of booklets about ozone layer protection, and implementation of National ODS Phase out Programme;	• Number of workshops and degree of participation of institutions listed in Item 4. above in awareness programme and related ODS phase out activities; • Number of publications prepared and disseminated; • Degree of market penetration of ODS free products; 8. Reduction of ODS consumption due to public awareness programme.
8. Facilitate / enable the collection of the required data on ODS use and consumption, establish the line of information exchange in the country and reporting to the Ozone Secretariat and IAs.	18. Collection, analysis and exchange of MP related information in the country and the region; 19. Preparation annual reports on ODS consumption and NOU activities to the Ozone Secretariat (OS); 20. Preparation and submission of necessary information and reports to the implementing agencies; 21. Exchange of experience between the NOU and other Network members to combat illegal trade in ODS, including sub-regional cooperation; 22. The implementation of regionally unified procedures for tariff classification and monitoring, control and reporting of data on trading of ODS using knowledge obtained from participation in the regional training workshop for CEIT Custom Officials.	9. Establishment of the line of communication with the Customs, and licensed importers to collect ODS import data. • Creation of ODS database; • Timely availability of Article 7 data in the Ozone Secretariat. 10. Establishment of the line of communication with the Ozone Secretariat and NOUs in border countries, . • Communication of MP related information to UNEP Ozone Secretariat (OS); • Reporting to the Implementation Committee; • Participation in Central Asia and Eastern Europe Networking; • Improvement of the quality of NOU reporting to IAs;
9. Facilitate the Government of Turkmenistan in reduction	23. Coordination of the implementation of the	11. Compliance with the MP ODS phase out

Objectives/Intended Results	Outputs/Activities/Deliverables	Outcomes/Performance indicators
and phase out of consumption of controlled ODS.	National ODS Phase- out Programme to meet compliance obligations.	schedule.

8.11.2.3 Attainment of objectives and planned results: Effectiveness

3208. The assessment of achieved results and their effectiveness involve the analysis of how the intended results as formulated in the sub-project were achieved and inputs have been translated into outputs and long-term outcomes, and impact. Performance indicators formulated in the third column of Table 2 served as evaluation tools of the sub-project outcomes. The effectiveness, relevance and efficiency were used as qualifiers in measuring the success or failure as appropriate.

8.11.2.3.1 Institutional strengthening: Establishment of the Ozone Office

3209. The project started in October 1999 with two years duration until October 201 but later on the implementation of the project had been prolonged until September 2005, without change of total financing. The national ozone office (NOU) was established as a non-governmental non-profit organization under the supervision of the Ministry of Nature Protection (MNP). The NOU had direct access to the Minister of Nature Protection and communicated with other Governmental institutions via the Ministry and its departments. The UNEP DTIE Secretariat was responsible for the administrative management of the IS sub-project. The funding has been channeled through the local UNDP office in Ashkhabad.

3210. The newly appointed NOU staff faced with the challenges of keeping accounts and reporting to two international organizations: UNEP and UNDP. The establishment of the NOU was delayed by administrative errors in the UNEP training project document resulting in inaccuracies in the NOU financial record keeping. No introductory training was provided to the NOU personnel. The NOU learning curve was very steep. The situation was exacerbated by the frequent rotation in the CEIT desk in UNEP Paris office and language barriers. Financial record keeping by the NOU appeared to be problematic and always in need of repeated clarification. The issues of the NOU reporting are discussed in the following sections.

3211. The NOU assisted the MNP to manage the project and coordinated the implementation of the Country Programme and its Action Plan, including development of regulatory measures, reporting, organizing public awareness, and the three sub-projects. The GEF funds provided for NOU salaries, computing and communications equipment, operating costs including telecommunications and office supplies, funding for public awareness and project support services.

8.11.2.3.2 Adoption of legislative acts and regulations on control of ODS

3212. The legislative base for ozone layer protection was adopted in 1991 in the Law "*On Nature Protection*", which contains general provisions on the regulation of the use of chemicals that deplete the ozone layer. The Law of 1996 "*On Air Protection*" provided measures to prevent harmful impact on the ozone layer and emphasized the importance of ecological assessment.

3213. In 2000, UNEP DTIE provided assistance to the NOU through a visit of a consultant who assisted with drafting the legislation. The legislation package was prepared and sent to the Cabinet of Ministers via the MNP. However, the proposal was halted when it was not approved by the Cabinet's legal department. A decree was approved by the President in September 2001 that required the import and export of chemicals and fertilizers to be licensed, but no specific provisions were included regarding ODSs. On the basis of this decree, the National Company "*Turkmendokunkhimya*" (later the Ministry of Energy and Industry) became responsible for issuing licenses for the import and export of chemicals while another institution – the State Commodity and Raw Materials Exchange - was responsible for registration of purchasing contracts.

3214. The established regulatory system has not proved to be effective. Turkmenistan could not cope with ODS phase benchmarks recommended by the Parties in its Decision XI/25. ODS consumption data for 2003 (43.4 ODP tonnes) and 2004 (58.4 ODP tonnes) significantly exceeded 2003 and 2004 targets which was inconsistent with the country's commitments. The 34th Meeting of the Implementation Committee sought the explanations of the reasons of non-compliance in 2003 and 2004. Turkmenistan had explained that its excess consumption of CFCs in 2003 and 2004 was due to the deficiency of the ODS control system that failed to limit the import of ODS in those years. This issue had, however, been addressed later by the introduction of an ODS import quota system. In April 2005, the MNP established such a system by issuing annual import quotas for each controlled ODS.

3215. Several other legislation and regulatory acts incorporated in the Country Programme have not been approached such as development of financial and economic incentives/disincentives on the use of ODS, introduction of the ban on ODS emissions and imports and exports of products containing ODSs, and introduction of licensing and qualification system for refrigeration servicing technicians.

3216. In 2009, the NOU has developed a new draft of a legislative package, including a regulation on imports and exports of ODS and ODS-containing products, which indicated the government's commitment to phase out ODS. Before being sent for the consideration of the Cabinet, this package has been updated in light of recommendations of the UNEP DTIE Workshop on Legislation held in Ashgabat in March 2009.

8.11.2.3.3 Enforcement of regulations on the ODS control through training of customs officers enforcement. Illegal trade.

3217. The Train-the-Trainer workshop for Customs officers and representatives of other key stakeholder agencies, including State Standard Committee (SSC) was delivered in July 2003 in Ashgabat. The workshop was lead by the international consultant. The customs operations manuals for the customs officers training have been copied and distributed among the participants. The workshop agenda included a number of presentations dealing, *inter alia*, with ozone layer depletion and the Montreal Protocol, national regulations concerning ODS, methods of identification of ODS, illegal trade in ODS, and a practical session on the identification of ODS using the refrigerant identifiers. Altogether, 14 customs officers were trained. At the end of the workshop, each participant received a certificate from the Government of Turkmenistan. ODS detection equipment was supplied to the Country to enable identification of ODS imported in bulk quantities and in equipment but not distributed to custom officers at checking points awaiting the Phase II training.

3218. The participants developed a set of recommendations dealing with improvements to the legislation concerning ODS and enforcement of the ODS import/export licensing system in Turkmenistan. As monitoring and control of ODS in Turkmenistan had not been well established at that time, raising awareness of Customs officers and other stakeholders present at the workshop was very important for the future implementation of Montreal Protocol provisions in Turkmenistan.

3219. Due to high rotation of Customs personnel between the border patrol and other work, there were few Customs officers left on duty that had been trained in Phase I of the Customs training workshop. The relative paucity of trained officers increases the risk of illegal trade in ODS. Furthermore, the ODS identifiers for Customs were stored by the NOU and had not yet been distributed to the Customs Officers. Completion of Phase II training of Customs officers and timely distribution of gas identifiers will be crucial for reducing the risk of illegal trade once the imports of CFCs and equipment containing CFCs is totally banned in 2010.

3220. Phase II of the training of Custom Officers never eventuated. The NOU was informed recently that new training facilities had been established in the Customs Headquarters and Phase II training would start in 2010.

3221. It seems that some of the Customs officers in coordination with the inspectors from the State Standards Committee (SSC) have been trained to detect illegal trade in ODS, and such trade has been intercepted on one occasion. However, the lack of equipment and more widespread training probably impedes a more comprehensive approach, which would be needed to ensure

that ODS is not being imported illegally into Turkmenistan. Until recently the working relationship between the SSC and the State Customs were poor, which increases the risk of illegal trade since both organizations were responsible for ODS detection at the border. Now, it appears that SSC is playing the major role in the border control. The NOU established close working relationships with the State Standard Committee (SSC) and its regional inspectorates.

3222. Prior to 2005, the legislation was not enforced and ODSs were imported without any restriction. There were no cases of detained shipment or illegal trade registered. Today, each imported chemical must be certified by the SSC before entering the market. Once the documentation related to a shipment is checked by the Customs, the shipment is passed to warehouses of the local inspectorate of SSC. SSC inspectors test the content of imported cylinders and equipment using refrigerant identifiers provided by the NOU and issues a certificate. There was only one instance of an ODS detained shipment reported to the evaluation team. In 2006, the surplus of 1,224 kg exceeding the 2006 quota was identified, detained and stored in the Customs warehouse. It was released one year later when it was included in the 2007 quota.

3223. Turkmenistan was allowed to import CFCs in compliance with control measures established for Article 5 countries. The CFC-12 refrigerant was available in the market in 2009 on a legal ground for about $5 to $7 per kg. This relatively low price suggests that 2009 quota was sufficient to meet the demand. Currently, the risk of illegal trade does not appear to be high. The risk will increase in 2010 when the legal import of CFC is stopped and in subsequent years.

8.11.2.3.4 The NOU role in co-ordination of ODS phase out activities

3224. The implementation of investment projects by UNDP/UNOPS and non-investment activities by UNEP required the coordination by the NOU on three levels: a) among governmental institutions; b) among implementing agencies; and c) among national commercial enterprises. The serious challenge for the NOU was timely development and promotion of the supportive legislation for controlling the movement and consumption of ODS in the country that was a prerequisite for the success of training and R&R programmes. These activities required active interaction with governmental institutions. The 2001 legislative package on licensing ODS imports was not enough efficient for the control of ODS imports. It was in 2005, when the quota system was finally implemented by MEP. The comprehensive legislation is still at the stage of drafting by the NOU.

3225. The implementation of training and investment activities required NOU coordination with UNEP and UNDP/UNOPS, Customs Office, and enterprises and numerous individual entrepreneurs in the refrigeration sectors. Both UNEP training components for custom officers and refrigeration technicians required establishment of training centres and other logistics. The training of refrigeration technicians was accomplished albeit with delay. However, the Phase II of customs training was not yet completed and ODS identifiers yet to be distributed. The Refrigeration Association is still to be established in Turkmenistan. The coordination role of the NOU was important in coordination of recovery and recycling project implemented with assistance from UNDP and UNOPS.

8.11.2.3.5 The public awareness programme

3226. The NOU disseminated information about the Montreal Protocol through mass media and TV, and organized lectures at schools, colleges, State University and held drawing competitions among children in summers camps, kindergartens and art schools. Annually, publications have been circulated in mass media on the occasion of the World Environment Day. The short movie on ozone protection has been regularly demonstrated on the local TV. The public awareness activities were widely praised but do not appear to be encouraging enough for the government to accelerate the implementation of legislation.

3227. As in many other countries, Turkmenistan had undertaken activities on Awareness Raising to shore up support from the public, government and business stakeholders for legislation and activities that would restrict and eventually phase out ODS. As in other countries, a baseline and performance indicators to measure the benefits of ODS reduction were never developed. These could have been, for example, before and after data on the number of ODS-free refrigerators bought by the general public, an increase in ODS refrigerators being sent for recycling, demand for information on the website (as number of hits) on ODS-free alternatives. It was therefore

impossible to evaluate the impact of the awareness programme.

8.11.2.3.6 The role of the NOU in collection of ODS related data and information exchange with other parties

3228. The ODS consumption data is a crucially important tool for the monitoring of the achievement of project main objective. The collection of ODS consumption data and reporting this data to national supervisory bodies and the Ozone Secretariat is the essential task included in the terms of responsibilities of the NOU. The data officially reported under Article 7 of the Montreal Protocol to the Ozone Secretariat and to the Implementation Committee, and serve as a basis for determination of the compliance of the country with the Montreal Protocol phase-out schedule

3229. The number and diversity of Government institutions dealing with imported ODS created problems in reporting annual consumption. Under existing legislation, the NOU is required to collect data from four separate institutions[546]. The prime source of data on imported ODS were sourced from the Customs' log book entries. However, these entries were not always consistent with the World Customs Organization Harmonized System Codes. Data from three other sources had been provided in incompatible formats and required time consuming work by the NOU to reconcile numerous entries. Import licenses issued by "*Turkmendokunkhimya*" were not reliable as they did not control quantities of imported bulk ODS or ODS-containing equipment. The prepared Article 7 reports have been undergoing lengthy internal approval procedures in the Ministry of Nature Protection causing further delays. As a result, the NOU had problems reporting data on time to the Ozone Secretariat. Turkmenistan was listed as a country in non-compliance in reporting consumption data to the Parties at the Meetings of the Implementation Committee in July 2003 and July 2004. In 2005, Turkmenistan applied to the Montreal Protocol for a change of its status of Article 2 country adducing the argument that their baseline data was not properly gathered leading to incorrect starting point for all projects developed.

3230. The same legislation is still in place that requires data collection from four separate institutions. The procedures for collection, verification and reporting of data on ODS consumption remain to be cumbersome and unreliable. It is likely that delays in reporting official consumption data will continue.

3231. According to UNEP procedure, the NOU is responsible for submission of half-yearly and annual progress reports. The NOU should also submit to UNEP quarterly project expenditure accounts and final accounts for the project, showing amount budgeted for the year and amount expended since the beginning of the year. According to UNEP DGEF PIRs, the substantive and financial reports have not been presented in a timely manner and not always been complete and accurate. The NOU has not been timely in submitting annual adjustments to their work plans to UNEP, which caused delays in disbursements of financial resources.

8.11.2.3.7 The role of the NOU in meeting compliance obligations

3232. The following CFC consumption and phase out benchmarks were reflected in the Country Programme and confirmed by Decision XI/25: 1999 – 22.0 ODP tonnes; 2000 – 15.0 ODP tonnes; 2001 – 10.0 ODP tonnes; 2002 -6.0 ODP tonnes; 2003 - zero CFC consumption. The project was completed two years later than planned in 2005, and the overall target of zero ODP consumption by 2003 was not met.

3233. Figure 45 shows the ODS reduction schedule developed in the Country Programme and the actual ODS consumption reported by Turkmenistan. Turkmenistan reported CFC consumption in 2000, 2001 and 2002 in increase of benchmarks established in Decision XI/25. In 2003, Turkmenistan did not meet the zero ODP consumption target and reported consumption of 43.4 ODP tonnes that was further increased in 2004 to 58.4 ODP-tonnes**.** The representative of Turkmenistan explained to the 35th Meeting of the Implementation Committee in December 2005 that its excess consumption of CFCs in 2003 and 2004 was due to the fact that it did not have regulatory authority to limit the import of ODS in those years. This authority was addressed in April 2005 when Turkmenistan implemented an import quota system.

3234. Turkmenistan was reclassified as Article 5 country at the XVI Meeting of Parties in November

[546] State Customs, "*Turkmendokunkhimya*" in 2001-2005, Ministry of Energy and Industry in 2005-2007, "*Turkmenchimia*" in 2007 -2008, State Commodity Exchange, and the State Standard Committee (SSC)

2004, taking into account that the per capita consumption of Annex A and Annex B substances of the Party was below the limits specified under Article 5 of the Montreal Protocol and the Party was classified as a low income country by the World Bank. Turkmenistan's reclassification meant that complete ODS phase-out would be required by 1 January 2010.

3235. The Government updated its Country Programme and Plan of Actions and applied for assistance to the Executive Committee of the Multilateral Fund. The MLF granted funding to the NOU for the continuation of institutional strengthening, the implementation of methyl bromide phase-out project, and a national strategy for adaptation to non-CFC MDIs. The funding of the NOU is secured so far through the MLF institutional strengthening project. The continuation of the NOU support from the MLF will be extremely important for the sustainability of the phase out, since there are no funds for the NOU envisaged in the Government budget. The recent observations demonstrate that Turkmenistan met the ODS 85% reduction target in 2007 reporting its CFC consumption of 5.6 ODP-tonnes, and reported zero consumption of methyl bromide.

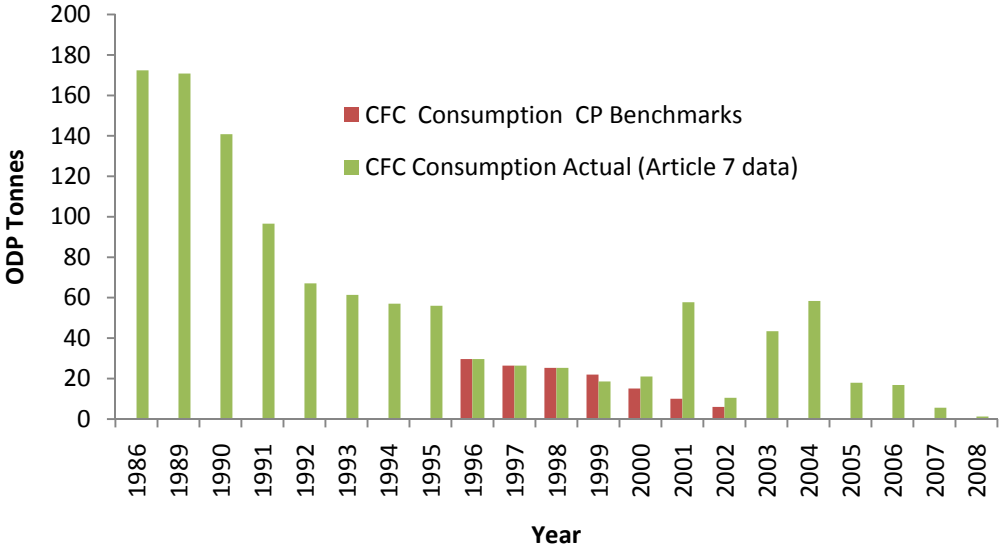


Figure 45: Planned reduction of ODS according to Turkmenistan's Country Programme (red) and ODS consumption reported to the Ozone Secretariat (green)

3236. The NOU assumed additional responsibilities and took initiatives to sustain zero methyl bromide consumption, to implement a national strategy to eliminate the use of CFCs in medical products, and to actively develop an HCFC phase-out strategy. The remaining amount of ODS which was not covered under the GEFs programme is likely to be phased out through market forces i.e., increasing prices of ODS chemicals and decreasing prices of their alternatives, as well as through legislative and/or taxation measures. The active engagement of Turkmenistan into the MLF network of regional ozone officers and support from the UNEP Compliance Assistance Programme create the basis for promising and positive results.

8.11.2.3.8 Relevance

3237. The achievements of the sub-project in the creation of the NOU, adoption of licensing system raising public awareness, and training of customs officers and refrigeration technicians were consistent with the Government strategy and priorities outlined in the country programme. However, the outputs and outcomes of the IS project were not in agreement with the Government strategy to achieve the complete CFC phase out by 2003. Contrary to this, the CFC consumption increased by a factor of three after six years of the IS sub-project duration. Similarly, the sub-project failed to play a role in the implementation of the GEF strategy in the Ozone Layer Depletion Focal Area to contribute to meeting CEIT obligations under the Montreal Protocol.

8.11.2.3.9 Efficiency

3238. It is problematic to assess the cost-effectiveness of the IS project in terms of US$/kg ODP.

However, from analysis of outcomes versus inputs, one can conclude that the project was not cost-effective. The GEF project was formulated for the duration of 3 years with the objective to assist the country in rapid phase-out of ODSs consistent with international efforts in the implementation of requirements of the Montreal Protocol and to achieve the zero CFC consumption by January 2003. Instead, the 2003 CFC consumption went up above the pre-project 1999 consumption and even increased further in 2004 exceeding 1999 consumption by a factor of three.

3239. The GEF IS support was extended until 2005 when the assistance to Turkmenistan was taken over by the MLF after the re-classification of Turkmenistan as Article 5 country.

8.11.2.4 Assessment of Sustainability of project outcomes

8.11.2.4.1 Financial resources

3240. Originally, the sub-project was planned for three-year duration. The budget approved by the GEF was the only source of funding for the establishment of the NOU, drafting of legislative measures, delivery of the awareness programme, collection of ODS consumption data, and training of customs officers. The Government in-kind contribution of $32,000 covered rental costs of premises occupied by the NOU, local telecommunication and logistics support in delivery of the awareness and training components. The sub-project was extended to 2005 within the same budget.

3241. As Article 5 country, Turkmenistan applied for the institutional strengthening assistance to the MLF. The MLF Executive Committee approved the IS project amounting to $115,693 for three years in July 2005. The XXI Meeting of the Parties took the principle decision on the extension of the institutional strengthening funding for Article 5 countries beyond 2010. The specific timeframe and other parameters of IS funding are under discussion of the MLF Executive Committee in the context of funding of HCFC phase out activities in Article 5 countries. There is a great likelihood of availability of additional financial resources in the near future that is very encouraging for the sustainability of achieved outcomes.

8.11.2.4.2 Socio-political and institutional framework and governance

3242. The Government delayed the introduction of the ODS imports quotas until 2005, which has resulted in Turkmenistan significantly exceeding the ODS consumption and reduction benchmarks agreed upon in the Country Programme and recommended by the Montreal Protocol Parties.

3243. With the new President, the socio-political system in Turkmenistan has been gradually evolving from the authoritarian regime to the principles of democracy. The role and importance of the Ministry of Natural Protection has been growing in recent years. The Government of Turkmenistan ratified the remaining Copenhagen, Montreal and Beijing amendments to the Montreal Protocol in March 2008.

3244. In 1999, the State Commission was established to supervise the implementation of Multilateral Environment Agreements, including the Working Group on Vienna Convention and Montreal Protocol. Currently, there is no multi-stakeholder project management committee in charge. A Project Steering Committee approach was not used to manage and implement this project. The NOU undertakes work planning in accordance with the schedule for activities outlined in the IS sub-project, training components and the R&R sub-project and submits this to the Ministry of Nature Protection. The NOU is responsible for the implementation of non-investment components and coordinates the UNDP R&R investment project. Within this management framework, the NOU have been given a mandate to coordinate the Government's activities to meet its commitments under the MP, but this mandate was limited. It appears that there was not enough high-level support for this process that caused delays in Phase II of training of customs officers, inconsistencies in ODS consumption data, and delays in the reporting to UNEP DTIE and DGEF.

3245. The NOU was engaged with refrigeration servicing and public sectors implementing the national ODS phase out strategy by promoting good servicing practices through training and refrigerant containment practices through recovery and recycling of ODS refrigerants. The Refrigeration Association is widely considered as an important partner to NOU in awareness raising, training

and dissemination of knowledge and information about ODS-free technology. Unfortunately, the Refrigeration Association is yet to be established in Turkmenistan.

3246. The evaluator met with the recently appointed new Minister of Environment Protection who confirmed the priority of ODS phase activities and expressed his full support to the NOU. Now, the NOU is actively involved in the Europe and Central Asia Network and Compliance Assistance Program funded by MLF and implemented by UNEP DTIE for Article 5 countries in the Region. These recent developments provide a degree of confidence that ODS phase out activities will be continuing in Turkmenistan.

8.11.2.4.3 Environmental

3247. The CFC consumption was reduced to 1.2 ODP in 2008. CFC-12 refrigerant was available in the market in 2009 for about $5 to $7 per kg. This relatively low price suggested that the supply of CFC-12 has been met by allowable imports.

3248. Due to high rotation of Customs personnel between the border patrol and other work, there were few Customs officers on duty that had been trained in Phase I of the Customs training workshop. There is still a number of CFC-based domestic and commercial refrigeration equipment available among households and end-users. The poor state of the economy is likely to result in a demand for CFCs from this equipment over the next 3 to 4 years, which enhances the prospects for illegal trade in CFCs once the imports of CFCs in bulk and equipment containing CFCs are totally banned in 2010.

3249. In the short- and long-term perspective, the NOU should be vigilant and undertake additional efforts on promotion and enforcement of additional legislation to maintain the environmental sustainability of the project.

8.11.2.5 Achievement of outputs and activities

3250. The expected outputs and activities have been formulated on the basis of the detailed overall project description. Several activities have not been reflected in the project and have been added to the matrix in Table 2. The achievement of outputs and activities is fully analysed in the *Section* called *Attainment of objectives and planned results: Effectiveness*. Most of activities were accomplished. A number of planned outputs and activities were not completed and are in the process of implementation at the time of evaluation and scheduled for completion in the near future.

8.11.2.6 Catalytic role

3251. The catalytic role of the IS project can be traced through increased penetration of new non-ODS refrigeration end-user equipment and introduction of good servicing practices. Those who received training under the project apply good practices in servicing the refrigeration equipment and transmit this knowledge to the new generation of servicing personnel. The catalytic role of distribution of recovery and recycling machines was less prominent because of relatively high cost of these machines and low income of servicing technicians in the country. The Refrigeration Association (RA) would have played an important role in dissemination of new knowledge and information among its members. However, the RA is yet to be established in Turkmenistan.

3252. The wide dissemination of information about the threats to the ozone layer contributed at certain extent in promoting ODS-free equipment and its acceptance by the general public. The IS project had an influence on the attitude of companies and servicing technicians towards ODS alternatives in the refrigeration and air-conditioning sector. It is difficult, however, to differentiate between the effects of training programme, the awareness-raising component, Government regulatory measures restricting ODS supply and market forces.

8.11.2.7 Assessment of Monitoring and Evaluation Systems

8.11.2.7.1 M&E design

3253. The M&E system specifies the routine monitoring of the sub-project implementation through the series of substantive and financial reports to be prepared and submitted by the NOU to UNEP DTIE and DGEF on programmatic and financial aspects (progress, terminal and financial reports).

The NOU substantive reports serve as a basis for formulating annual UNEP Project Implementation Reports submitted to the funding agency i.e. GEF Secretariat. UNEP also relies upon ODS consumption data provided by the Ozone Secretariat in their annual reports and reports of the Implementation Committee which monitors the compliance of Turkmenistan with the Montreal Protocol and provides its reports twice a year.

3254. The project implementation plan with the timetable is the part of the IS project document that indicates the start, the duration in months and the end of implementation of major components. The IS project document also provides the format for half yearly progress reports by the NOU with the information on delivery of outputs/services. The IS project document in Turkmenistan contains general and specific objectives but not sufficient and relevant performance indicators that could be well served for the purpose of this evaluation. The UNEP semi-annual reporting format does not allow easily spotting the lack of crucial parameters. The outputs for the evaluation of the institutional strengthening sub-project were inferred from the detailed overall project description, UNEP PIRs and other available information and assessed as commensurate to real outcomes with relevant performance indicators and reproduced in Table 2. The supervision missions have been also envisaged to be conducted by the UNEP Task Manager and/or UNEP Fund Management Officer as well as regular meetings of the Project Steering Committee

3255. The issue of limitations of existing M&E systems was raised in the 2004 UNEP Mid-term Evaluation Report in particular stressing the lack of results-based management and accountability frameworks (RMAFs) and the need in well articulated and relevant prior agreed performance indicators. The existing deficiency of the M&E system was acknowledged by UNEP in its project implementation reports.

3256. The evaluation team have identified shortcomings in the M&E system associated with the lack of required indicators such as baseline information for each outcome-level; SMART indicators to track project outcomes, and clear distribution of responsibilities for monitoring project progress. Thus, the effectiveness of awareness campaign was assessed by the number of leaflets, published articles and events involving mass media etc. However, there was neither a baseline established, nor performance indicators developed, that could be used to monitor the impact of the awareness raising campaign on ODS phase-out activities in the country. Similarly, additional indicators are required (apart from the number of customs officers trained) in order to assess the contribution of the customs training component into the reduction of the illegal trade and enforcement of the ODS licensing system.

8.11.2.7.2 M&E plan implementation

3257. The timely reporting of Article 7 data is one of responsibilities of the NOU. The timeliness of reporting of ODS consumption data have been under constant scrutiny by the Ozone Secretariat and the Implementation Committee. The NOU failed to report ODS consumption data for 2000, 2001, 2002 and 2003. The non-compliance of Turkmenistan with Article 7 was recorded in the Ozone Secretariat Data Reports to the XIV, XV and XVI Meetings of the Parties[547]. The Implementation Committee recognized at it 33th Meeting in Prague, 17-19 November 2004 that Turkmenistan had reported all the missing information except that relating to 2003. The 2003 and 2004 data had been reported in 2005 and were the subject of discussion at the 35th Meeting of the Implementation Committee. It is anticipated that the issues with Article 7 data reporting would have to be the subject of discussion between UNEP DTIE and the NOU. However, evaluators have no evidence of UNEP DTIE reaction to this non-compliance situation. The problems with reporting Article 7 data have not been highlighted in the 2004 UNEP Mid-term Evaluation Report (MTER). The failure to identify the real problems in Article 7 reporting appears to be related to the poor co-ordination of monitoring of the reporting compliance between UNEP DTIE and the Ozone Secretariat.

3258. Another evidence of inefficiency in the implementation of the M&E Plan is associated with the failure to identify problems with the timely introduction of the quota system in Turkmenistan that resulted in non-compliance with the benchmarks established by the Parties. The 2003

[547] UNEP/OzL.Pro.14/3; UNEP/OzL.Pro.15/4; UNEP/OzL.Pro.16/4;

Project Implementation Report prepared by UNDP and UNEP[548] confirmed that the planned licensing system had not reached the final approval stage and that the import quota system was not in place. The 2004 MTER also pointed out to the same problem. There were no UNEP DTIE supervisory missions. However, there was always an opportunity of the to-face-face discussions at meetings of Parties attended by NOU and UNEP DTIE officers.

3259. UNEP DTIE discussed issues of the NOU reporting at the Workshop on Management of GEF-funded Ozone Projects, Paris, 5-7 April 2004. The NOU explained that the release of reports was extremely slow largely due to a long and bureaucratic review process within Government before release to UNEP. The NOU explained further that its capacity was not sufficient to meet the annual reporting requirements as per Article 7 of the MP. However, the NOU would be able to provide updated knowledge on in-country project progress. The NOU referred to the frequent rotation of UNEP DTIE personnel in the CEIT desk communication barriers. UNEP DGEF informed the NOU that they have created a formal post for an officer to be dedicated to matters such as these, and promised to take measures to improve the line of communication with the NOU even in the absence of submission by higher officials.

3260. UNEP DGEF issued its 2005 Project Implementation Report with extensive analysis of the Project in Turkmenistan and the M&E system. This analysis was taken into consideration in this evaluation of the M&E component of the project.

8.11.2.7.3 Budgeting and Funding for M&E activities

3261. The internal monitoring of ODS phase out activities by the NOU staff and local consultants was covered from the budget of the IS project. There is no specific budget line in the project budget to cover cost of the implementation of the M&E Plan. The monitoring functions were part of working responsibilities of UNEP DTIE, TM and FMO. The evaluation team had no access to UNEP financial documents to elaborate on this issue further.

8.11.2.7.4 Long-term Monitoring

3262. Currently, as Article 5 country, Turkmenistan has to report annually its ODS consumption data to the Ozone Secretariat in accordance with Article 7 of the Montreal Protocol and to provide annual progress reports to the Secretariat of the Multilateral Fund. The timely reporting is also under the supervision of UNEP DTIE which involves Networking and CAP facilities to monitor the reporting activities. The financial support of the long-term monitoring activities is part of the IS support from the Multilateral Fund that Turkmenistan is entitled to as Article 5 country. The XXI Meeting of the Parties took the principle decision on the extension of the institutional strengthening funding for Article 5 countries beyond 2010. The specific timeframe and other parameters of IS funding are under discussion of the MLF Executive Committee in the context of funding of HCFC phase out activities in Article 5 countries.

8.11.2.8 Assessment of processes that affected attainment of project results

8.11.2.8.1 Preparation and readiness

3263. Turkmenistan has ratified the Vienna Convention and the Montreal Protocol in November 1993 and the London Amendment in March 1994. After the ratification of the Vienna Convention and the Montreal Protocol, the Law on the Protection of atmosphere was adopted in December 1996 with a particular provision related to the protection of the ozone layer that helped in development of the regulatory framework under the IS sub-project.

3264. Representatives of Turkmenistan, including the Minister of Nature Protection participated at the Intergovernmental Consultative Meetings of High-Ranking Officials on the Montreal Protocol, organized by UNEP and funded by the GEF in Tashkent, May 1997 and Almaty, April 2000. Turkmenistan also participated in UNEP regional workshops in Kiev, December 1998 and Baku, June 2000 as part of 21-country project: Promoting Compliance with the Trade and Licensing Provisions of the MP in CEIT's, which was implemented by UNEP. The project rationale and objectives were to train officers in ODS monitoring and control; and in the establishment, operation and enforcement of a licensing systems to enable compliance with the Montreal

[548] Final Report on the Projects in Turkmenistan, 2003

Protocol trade and licensing provisions. Four regional training workshops were organized for representatives from 21 CEITs. The NOU officer from Turkmenistan participated in the workshops held in Kiev, Ukraine (December, 1999) and Baku, Azerbaijan (June 2000). The implications and the impact of these events were not very significant because the new Minister of Nature Protection and the new Head of the NOU were appointed in 2001.

3265. The GEF intervention in CEITs addressing the ODS phase out issues was based in great extent on the experience gained by the Multilateral Fund and its implementing agencies (UNEP, UNDP, World Bank, UNIDO) in Article 5 countries. The GEF intervention in Turkmenistan followed the strategy that proved to be successful in many Article 5 countries i.e. as a first step, preparation the country programme and the Refrigerant Management Plant with direct involvement of the Government and other stakeholders concerned. The preparation of these strategic documents contributed greatly into the development and design of the package of the GEF ODS phase out project and its components in Turkmenistan. UNEP is responsible for the implementation of non-investment activities at the institutional level, including the institutional strengthening and capacity building activities, awareness programme and training components. UNDP together with UNOPS provided assistance implementing recovery and recycling investment project in the refrigeration servicing sectors representing the bulk of ODS consumption. UNEP and UNDP actively participated in similar undertakings and were very much familiar with challenges they faced in Turkmenistan.

3266. The project design is not sufficiently flexible to tackle new emerging issues associated with other than CFC controlled substances such as methyl bromide and MDI. The change of its Montreal Protocol status from Article 2 to Article 5 country proved to be beneficial for Turkmenistan allowing for the assistance from the MLF in addressing methyl bromide and MDI issues.

8.11.2.8.2 Country commitment and motivation

3267. Turkmenistan ratified the Vienna Convention and Montreal Protocol, and all its amendments demonstrating commitments to ozone international treaties. The Government of Turkmenistan approved the ODS Phase out Country Programme that was elaborated with the assistance of UNEP and UNDP and committed to undertake a series of measures leading to the phase out the ODS consumption by January 2003. The commitments of the Government have been reflected in Decision XI/25. In 1999, the government established an "Inter-ministerial Commission on the implementation of the country commitments related to UN environmental conventions"[549]. The working group on ozone was created as a part of this Commission and consisted of representatives of key national stakeholders.

3268. The motivation of the Government was well expressed. However, the implementation of the commitments was not successful. The Government delayed immensely the introduction of the ODS import quota system and training of customs officers. The issue of collection and reporting of ODS consumption data was has not been resolved until 2005.

8.11.2.8.3 Stakeholder involvement

3269. The implementation of National ODS Phase out Programme and GEF funded activities required interaction of the NOU and MNP with a number of national stakeholders, including the Governmental agencies such as the State Customs Committee, Ministry of Energy and Industry, State Commodity Exchange, and the State Standard Committee, as well as refrigeration servicing companies and ODS major importers.

3270. The establishment of the refrigeration association was envisaged in the Country Programme. However, the registration of any NGO requires that the membership should not be less than 250 members. This condition cannot be met by the refrigeration association.

8.11.2.8.4 Financial planning

3271. The GEF approved budget covered all the activities envisaged in the project. The financial planning and control was under the responsibility of the UNEP DTIE and DGEF. The allocation of cash was based on the review of quarterly project expenditure accounts, showing amount budgeted for the year and amount expended since the beginning of the year, plans of future

[549] Presidential decree of 1 March 1999.

actions and requests for cash advances prepared by the NOU. The monies have been transferred to the NOU through local UNDP office in Ashkhabad. On the outset, there was an administrative error in the UNEP training project document resulting in inaccuracies in the NOU financial records and compacted interactions with the local UNDP office which acted as a financial intermediary. The authentic training document was provided to the NOU only in 2004. The emerging accounting issues could not be resolved easily by the local accountant and caused delays in submissions of financial reports to FMO. Due to these problems, the correction of budgets to facilitate completion of activities was done late in the project. This then resulted in an interruption of activity during which time staff funding run short, such that UNEP was forced to do a drastic budget revision with the country to try to accommodate some salary lines for the NOU staff to complete their activities under the project. The UNEP DTIE and DGEF organized the meeting in Paris on 5-7 April 2004 that facilitated the streamlining of the financial reporting issues.

3272. The DGEF characterized the financial planning and management within the country as inadequate, and that the country had a hard time tallying up total disbursements over time. FMO also highlighted the fact that the NOU always have problems harmonizing their records with those of that UNDP country office, and ultimately UNEP.

3273. Financial auditing is carried out on annual basis by an independent (external) auditor. For the finances delivered through UNDP, it is audited by UNDP Office in Turkmenistan. The evaluation team has not been provided with the access to financial planning and reporting documents and, therefore, is not in a position to comment on the appropriateness of financial planning standards applied by UNEP and UNDP.

3274. The negative aspects of the financial planning in Turkmenistan point out to the importance of introductory training of NOU staff on UNEP accounting requirements and financial reporting at the early stage of the NOU existence.

8.11.2.8.5 UNEP / UNDP Supervision and backstopping

3275. UNEP and UNDP were two responsible agencies for the country program preparation and in implementation of institutional strengthening and capacity building, awareness raising and training activities. UNEP DTIE and DGEF were supervising the NOU since its inception.

3276. The Project Implementation Report in 2003 by UNDP and UNEP confirmed that the planned licensing system had not reached the final approval stage and that the import quota system was not in place. A similar report in 2004 acknowledged the potential for illegal trade. It appears that UNEP and UNDP have not provided Turkmenistan with the needed support to assist the country with compliance. A collaborative and supportive role by UNEP DTIE and UNDP toward Turkmenistan would have assisted the NOU in their endeavours to comply with Decision XI/25 of the Parties possibly contributing toward the development of practical benchmarks in cooperation with the Implementation Committee. There were indications during the evaluation mission that early actions by the Implementation Committee would have been taken very seriously by the Government, which would have promoted earlier development of the legislation important to the control and phase out of ODS.

3277. There were no supervisory missions organized by UNEP DTIE to Turkmenistan from 1999 to 2004. The face-to-face meetings took place at the end of the project in April 2004 at the Workshop on Management of GEF-funded Ozone Projects. Countries with reporting problems (Turkmenistan, Tajikistan and Uzbekistan) were funded to visit DTIE's Paris offices to meet with the Fund Management Officer and UNEP DTIE staff who were dedicated to work with the region in early 2004. The Turkmenistan NOU head and assistant were in attendance. The received training on financial procedures and were allowed to raise any problems they were encountering. The meeting in Paris was focused mainly on management issues. The status of legislation was assessed in a brief statement as "*ODS legislation is in place all of the countries*."[550] According to the Workshop Report, no issues were raised by UNEP DTIE in regard to the absence of the ODS import quota system, lack of reporting on ODS consumption and potential non-compliance of Turkmenistan in meeting its targets outlined in the Action Plan

[550] Workshop report; Workshop on Management of GEF-funded Ozone Projects, Paris, France, 5-7 April 2004

approved by the Parties.

3278. UNEP DGEF recognized in its 2005 PIR that there was a frequent rotation of UNEP project officers during implementation of IS and Training projects in CEITs. The consequence of this was weak coordination between UNEP departments (UNON, DTIE, EOU) and also inadequate liaison and communication with the NOUs causing late delivery of planned activities and some confusion about payments. It was also at this time that there were insufficient resources for follow-up and country visits to know what was going on in the project during its long delay in start-up.

3279. The UNDP office in Ashkhabad served as a financial institution supporting UNDP investment activities and UNEPs institutional strengthening and training components. The NOU is in close contact with the UNDP country office.

3280. Currently, the NOU is in close interaction with UNEP DTIE through participation in the ECA Network and Compliance Assistance Programme.

8.11.2.8.6 Co-financing and Project Outcomes & Sustainability

3281. The Government assessed its co-financing of the IS component amounting to $22,800 (in-kind) for three years that covered the office space, local telephone, office furniture, and local travel. Reporting of in-kind co-financing was not a part of the original project reporting. There have been no official lists of leveraged resources for the projects of the ODS portfolio, as this was never mandatory for ODS projects.

3282. The Government in-kind support continued after 2005 when the IS support has been taken over by the MLF. The future of the NOU beyond 2010 will depend on MLF policies on continuation of the IS support in Article 5 countries that are now under discussion by the MLF Executive Committee. The continuation of NOU funding is linked with accelerated phase out of HCFCs in Article 5 countries and development of HCFC Phase out Management Programmes (HPMP).

8.11.2.8.7 Delays and Project Outcomes & Sustainability

3283. The problems in financial management (discussed above) caused delays in implementation of IS and custom training components. The major risk to sustainability, however, was associated with inadequate and not timely adopted ODS regulatory system that is discussed in detail above.

8.11.2.9 Project ratings

3284. The ratings of the IS project have been performed according to categories and criteria specified in Annex 1: Terms of Reference of the evaluation. The ratings are presented in Table 66.

Table 66: Ratings for the Institutional Strengthening project in Turkmenistan

Criterion	Evaluator's Summary Comments	Rating
Attainment of project objectives and results (overall rating)	The project had significant shortcomings in the achievement of its objectives. The ODS consumption increased over the time of project implementation.	**MU**
Effectiveness	The Ozone Office was established albeit with delays. Training of customs officers is yet to be completed. The commitment of the Government and performance of the NOU in terms of ODS data reporting was not satisfactory. The ODS phase out targets have not been achieved.	**MU**
Relevance	ODS consumption increased. Project outcomes are not consistent with GEF strategy in ozone focal area.	**MS**
Efficiency	The results achieved in relation to the cost and time spent do not make the IS project effective.	**MS**
Sustainability of Project	There is a high probability of sustenance of	**S**

Criterion	Evaluator's Summary Comments	Rating
outcomes (overall rating)	positive project outcomes and impacts in the distant future.	
Financial	The GEF financing of the NOU stopped in 2005. As Article 5 country, Turkmenistan is receiving assistance from the MLF and entitled for institutional strengthening assistance beyond 2010 subject to decisions of the MLF Executive Committee. There is a high likelihood of sustainability of achieved outcomes.	**S**
Socio Political	International commitments were accepted by the Government but not fully met mainly due to the lack of strong support and timely adoption of legislation.	**MS**
Institutional framework and governance	The acting Minister of MNP expressed full support to the NOU and continuation of ozone protection activities. The position of the NOU has been strengthening in the institutional hierarchy in the country.	**S**
Environmental	The demand for CFC refrigerant still exists and will be maintaining in the near future. Effective border control and further enforcement of legislation are required to alleviate the risk to the sustainability of zero ODS consumption after 2010.	**MS**
Achievement of outputs and activities	Not all the planned outputs were achieved during the project. The most important results have been accomplished after the closure of the GEF project.	**MS**
Monitoring and Evaluation (overall rating)	The design of the IS project is not reflective of state-of-the-art project management.	**MS**
M&E Design	The M&E system was ineffective to ensure the operational monitoring of the implementation of the project. The design of the IS project is lacking of result-based management and accountability framework. Risk analysis was also not a part of project design.	**MU**
M&E Plan Implementation (use for adaptive management)	UNEP DTIE failed to identify timely critical parameters in order to take corrective actions and bring the country at the earliest to compliance with established targets.	**MU**
Budgeting and Funding for M&E activities	There was no specific budget line in the project budget to cover cost of the implementation of the M&E Plan.	**MS**
Catalytic Role	The catalytic role of the IS project can be traced through increased penetration of new non-ODS refrigeration end-user equipment and the use of good servicing practices.	No ratings are requested for the catalytic role.

Criterion	Evaluator's Summary Comments	Rating
Preparation and readiness	The Government accessed the MP in 1994 and adopted the Law on Protection of Atmosphere in 1996. The UNEP preparatory regional workshops did not prove to be efficient for raising the readiness of the NOU. The adoption of the key legislation was in significant delay.	**MS**
Country ownership / commitments	The Government demonstrated its commitment and motivation by establishing the NOU. The Government was not very supportive in timely adoption of key legislation and releasing the ODS consumption data.	**MS**
Stakeholders involvement	The project involved all relevant stakeholders in project preparation and execution. The NOU was in communication with UNEP DTIE, UNDP/UNOPS and their consultants, local UNDP office, and Governmental institutions. There were no relevant NGOs in the country. The Refrigeration Association is yet to be established.	**MS**
Financial planning	Financial planning was not adequate and characterized by errors, inaccuracies and delays in reporting and taking actions on the side of both UNEP and the NOU. The flow of funds was not appropriate at certain periods of time. UNEP took efforts to resolve the accounting issues at the final stage of the project.	**MU**
UNEP Supervision and backstopping	UNEP and UNDP have not provided Turkmenistan with the needed support to assist the country with compliance. There were no supervisory missions organized by UNEP DTIE to Turkmenistan from 1999 to 2004. There was a frequent rotation of UNEP project officers resulting in inadequate coordination between UNEP departments and also inadequate liaison and communication with the NOUs.	**MU**
Overall Rating		**MU**

8.11.3 GF/4040-02-04 – Training of trainers for use of ODS-free refrigerants in maintenance and service;

8.11.3.1 Background

3285. In 1998, UNEP and UNDP in close co-operation with the Government prepared the Refrigeration Management Plan (RMP) as part of the National ODS Phase out Programme. The total ODS consumption in the refrigeration servicing sector was of 31.1 ODP tonnes in 1996 composed of 29.6 ODP tonnes of CFC-12 and 1.5 ODP tonnes (27.2 metric tonnes) of HCFC-22. The ODS phase out in the refrigeration servicing sector requires a systematic approach based on a comprehensive, multi-faceted strategy aiming at establishing the proper sequencing of projects and policies that proceed in a coordinated way. The RMP served as a strategic document for ODS phase out activities in the most important refrigeration servicing sector. The training of

technician in good practices is an important part of the strategy outlined in the RMP. The survey identified about 66 repair workshops with 410 servicing technicians. The UNEP in cooperation with UNDP formulated the project on training of refrigeration technicians using good servicing practices.

3286. The Refrigerant Management Plan proposed the training programme to be implemented as a first priority, and a national recovery and recycling project to be implemented after necessary legislation, regulation and fiscal instruments are in place.

3287. The project aimed at the improvement of servicing and maintenance practices in order to prevent intentional and/or unintentional releases of CFC into the atmosphere, making it possible for refrigeration equipment to operate to the end of its useful life. The introduction of good servicing and maintenance practices would result in reduction of CFC refrigerant consumption and emissions. The project established a specific benchmark of 6.53 ODP tonnes to be phased out. The project design stipulated the implementation of training programme in two phases:

3288. Train-the-Trainers Phase I component was designed for refrigeration professionals to provide them up to date information on good servicing practices and assist in the development of the training curriculum which they will be using as instructors in training servicing technicians.

3289. Train-the-Technicians Phase II component. In a second phase, the trained instructors will provide technical information and hand-on training to servicing personnel in the refrigeration sector on good servicing, maintenance, repair and ODS containment practices reducing ODS consumption during servicing the refrigeration equipment.

8.11.3.2 Attainment of objectives and planned results

8.11.3.2.1 Objectives, outputs, outcomes and performance indicators

3290. The objectives of the project are to train the adequate number of servicing technicians in good servicing practices, reduce the demand in CFCs in the refrigeration servicing sector, prevent intentional and/or unintentional emissions of ODS into the atmosphere and extend the useful life-time of the refrigeration equipment. In the absence of the logframe for the evaluation of the training components, the performance indicators were inferred from the outputs/ deliverables contained in the project document and UNDP and UNEP PIRs (Table 67).

Table 67: Turkmenistan Training Objectives/Intended Results - Outputs/Deliverables - Outcomes/Performance indicators

Objectives/Intended Results	Outputs/Deliverables	Outcomes/Performance indicators
1. Training of adequate number of local trainers in good servicing practices to reduce ODS emissions.	1. Procurement and delivery of training equipment; 2. Establishing a training center; 3. Development and translation of training curricula and manuals; 4. Conducting Train-the-Trainer Workshops (Phase 1); 5. Certification of trainers ;	1. Availability of adequate number of local trainers. • Time required by UNEP to disburse GEF funding; • Timely establishment and availability of equipped training center (5 centers); • Availability of training materials in the training process; • Number of certified trainers (25) ;
2. Training of refrigeration	6. Establishing regional	2. Introduction of good

Objectives/Intended Results	Outputs/Deliverables	Outcomes/Performance indicators
technicians in good servicing practices to reduce ODS emissions.	training centers equipped with training equipment; 7. Compilation of lists of participants and training schedule. 8. Dissemination of training material among servicing companies and individual technicians around the country. 9. Conducting training workshops for servicing technicians (Phase 2); 10. Organizing testing and certification of trainees;	servicing practices into routine operation of servicing network and reduction ODS emissions. • Availability of functioning training centers; • Number of months elapsed since training-the –trainers workshop; • Number of trained and certified technicians (400) ; • Evidence of application of received knowledge in practical work; • Evidence of availability of modern servicing tools and equipment; 3. Contribution to meeting the ODS phase-out schedule. • Reduction in ODS emissions due to introduction of good servicing practices by 6.53 ODP tonnes;
3. To ensure the continuation of training activities upon completion of the project.	11. Introduction of ODS related curricula into training programmes of technical universities and vocational schools. 12. Continuation of hands-on training in refrigeration servicing industry. 13. Development and promotion of a regulatory framework for the refrigeration sector which will enforce good maintenance and servicing practices.	4. Growing availability of graduates from technical universities and vocational schools trained to handle ODS issues. • Number of graduates trained annually; • Number of technicians receiving hands-on training and certified annually. 5. Introduction of regulations on qualifications requirements for refrigeration servicing personnel.

8.11.3.2.2

8.11.3.2.3 Effectiveness

3291. The GEF funds amounting to $105,655 were provided to UNEP for *Training the Trainers in Refrigeration* in accordance with the project document in October 1999. This date can be considered as the start of the project. The duration of the project was determined to be 24

months. The funds approved covered the cost of establishing training centres, including training equipment, fees and travel costs for an international consultant, fees for a local consultant, adaptation and translation of technical materials, office supplies, workshop costs for both initial and subsequent training events, and the cost of simultaneous translation for the workshops.

3292. The training component was implemented by UNEP and UNDP/UNOPS in co-operation with the UNDP country office. The responsibilities of UNDP/UNOPS were limited to procurement of equipment for the training centres which was completed with some delays. From the outset, there were administrative delays associated with financial arrangements proposed by UNEP to proceed with the sub-project. Two separate sources of funding were involved creating confusion, and accounting and reporting problems for the NOU, UNEP and local UNDP office. As a result, the overall delay in the start of the programme was about two years against the schedule determined in the RMP.

3293. Once the training equipment was delivered to the country, three training centres have been established in Central Commercial Refrigeration Servicing Facility in Ashkhabad and in two technical colleges. Later, another two training centres have been organized. In the preparation phase, the NOU staff and a refrigeration expert have prepared appropriate training modules for the training program by adapting the Russian version of the UNEP manual "Good Practices in Refrigeration". Later this manual was translated into the Turkmen language. The certification schemes for refrigeration instructors and servicing technicians were also developed.

3294. Upon completion of the programme, the NOU reported that about a half of trainees were students in technical schools and colleges. The duration of training courses was the same 3 days. It is not clear whether the training curricula was adjusted to tailor the different background of trainees.

3295. The first train-the-trainers workshop was held in June 2001 in Ashkhabad with 25 participants from major refrigeration servicing enterprises, educator from the Turkmen Polytechnic Institute, technical colleges and public and Government institutions. The international expert from the German State Refrigeration Technical Institute was invited as a leading specialist The workshop curriculum contained information on issues of ozone layer depletion and protection, as well as technical information on ODS and non-ODS refrigerants, lubricants, good maintenance, servicing and repair of different type of refrigeration equipment, recovery and recycling of refrigerants, retrofitting options and practices, and future technological development in the refrigeration and air conditioning sector. Hands-on demonstrations of recovery and recycling, evacuation and recharging operations were also conducted using different refrigeration equipment. At the end of the workshop seminar, 16 refrigeration professionals passed the tests and were certified as future trainers. The participants also completed evaluation forms and expressed their recommendations.

3296. The Phase II of training the refrigeration technicians followed in different regions of the county. Altogether, 17 training workshops have been conducted for servicing technicians and students in technical vocational schools in the period from September 2001 until May 2004 for 380 participants. The training programme covered the majority of servicing personnel working in registered servicing companies. The list of such companies is available in the NOU. The NOU does not have complete information about unregistered technicians that mostly operate as seasonal service technicians.

3297. The NOU initiated discussion with the Ministry of Education resulted in incorporation of elements of the training module used in the training programme into the curricula of the Polytechnic Institute in Ashgabat which provides a five year engineering refrigeration technology course as well as technical schools and colleges.

3298. Additionally, training on refrigerant recovery and recycling, and good repair and maintenance practices was provided by UNDP in July 2001. This training component will be discussed under TUK/98/G35- Recovery and recycling of ODS refrigerants in the air-conditioning and refrigeration sector.

3299. The application of good servicing practices requires the availability of modern servicing equipment and tools. The budget of the training project did not contain provisions for procurement of such equipment and tools. Under the recovery and recycling sub-project, only 31 kits of the servicing equipment tailored for servicing and refrigerant recovery operations were

purchased and distributed together with recovery and recycling machines and other equipment. The bulk of servicing equipment (27 servicing kits) has been distributed among two major state-owned servicing enterprises having affiliates in different regions. Four remaining servicing kits have been provided to two smaller private enterprises. Thus, the majority of private servicing workshops was not provided with modern servicing equipment.

3300. UNEP DTIE and the NOU albeit with delay undertook the planned activities for the training of trainers and servicing technicians and almost met the established target in terms of the number of trainees. The training program has brought the expertise and knowledge about good servicing practices and together with provided servicing tools contributed to the reduction of ODS emissions into the atmosphere.

3301. It does not appear that the target of 6.53 ODP tonnes phase out was met as a result of training activities. Most of training of students in vocational schools was performed in 2002 and training of technicians was conducted mostly in 2003. The CFC consumption in Turkmenistan was growing in 2003 and 2004 up to 58.4 ODP tonnes significantly exceeding the 1996 baseline level of 29.6 ODP tonnes and started to decline since 2005 reaching 1,2 ODP tonnes in 2008.

3302. There is no data available that could establish quantitatively the contribution of the training project into the reduction of CFC consumption in the refrigeration servicing sector in Turkmenistan. In general, notwithstanding the fact that UNEP conducted numerous training projects for refrigeration servicing personnel in CEITs and Article 5 countries, yet there is no methodology available for determining the impact of these projects in quantitative terms.

3303. The NOU developed proposals for mandatory qualification and licensing of servicing technicians and incorporation of this proposal into the newly adopted legislation on licensing of professional activities in Turkmenistan. Unfortunately, this proposal was not accepted and included into the list of professions that require mandatory licensing.

8.11.3.2.4 Relevance

3304. The targeted reduction of ODS in the training programme is fully consistent with objectives of the Montreal Protocol. The training component being part and parcel of the ODS phase out programme is also fully consistent with the objectives of the GEF ozone focal area to phase out ODS consumption in CEITs. The Table 4 shows the relationship between inputs, outputs and outcomes. The outcomes of the training component are fully in agreement with the strategy and priorities outlined in the Country Programme of Turkmenistan. The training programme contributed to the reduction of ODS emissions into the atmosphere. Since most CFC refrigerants are also greenhouse gases, the decrease of ODS emissions was a factor in the reduction of the threat of global warming, bringing certain benefits to the climate.[551]

8.11.3.2.5 Efficiency

3305. The ODS phase out target of the training component was 6.53 ODP tonnes. The project document and RMP do not provide the rationale behind the proposed target or methodology for the assessment of the quantified effect of training activities. The CFC consumption was increased in 2003 and 2004 and reduced since 2005 to 1.2 ODP tonnes in 2008. It is not possible, however, to assess a share of a reduction in CFC consumption due to training of the refrigeration servicing personnel. Therefore, the efficiency cannot be assessed by cost-effectiveness expressed in $/kg ODP phased out.

3306. The qualitative assessment of efficiency could be made through regular monitoring of changing servicing practices of technicians received training through the project. This monitoring, however, was not specifically mentioned in the project document.

3307. The number of trained technicians, including trainers (395) almost matched the target established in the project document (410). The efficiency can be assessed by subdividing the total cost of the training component ($ 105,655) by the number of trainees. The cost-effectiveness would be about $ 267 per a trainee that is below the average value ($291/trainee)

[551] IPCC/TEAP Special Report on Safeguarding the Ozone Layer and the Global Climate System, 2005

determined in similar training programmes conducted in Azerbaijan, Tajikistan and Turkmenistan.

3308. The preparation and implementation of Phase 1 and Phase 2 training activities have been accomplished within 60 months that was far in excess of the established time line and demonstrated a poor efficiency of the implementation.

8.11.3.3 Assessment of Sustainability of project outcomes

8.11.3.3.1 Financial resources

3309. Once the training programme was completed and the project was terminated in 2004 there was no financing specifically provided by the Government or by the MLF to continue and expand the training activities in the refrigeration servicing industry. As Article 5 country, Turkmenistan is entitled for assistance from the MLF for accelerated phase out of HCFCs. There is a potential for continuation of funding of training activities under the HCFC Phase out Management Plan (HPMP) which is in the process of development for Turkmenistan.

8.11.3.3.2 Socio-political

3310. The Government commitments in support of the training programme was reflected in involvement and participation of several Government institutions such as the MNP, the State Customs Office, State Stock Exchange, two State Refrigeration Servicing Companies, the Committee of Standardization, the Ministry of Education and staff from some educational institutions (technical schools and colleges).

3311. The evaluator has been informed by the management of the State Refrigeration Servicing Company that a sizable portion of trained servicing technicians emigrated. Apparently, there are small servicing businesses that have not been fully covered by the UNEP project. It appears that currently these businesses and individual entrepreneurs do not have access to any training facilities**.** Lack of training of refrigeration technicians on new refrigeration technologies and alternatives increases the risk of unskilled technicians entering the workforce. The adoption of the legislation requiring mandatory qualification of servicing personnel could be a strong stimulus for continuation of the training. However, the proposal from the NOU in this respect was not accepted. In the absence of such legislation, the risk of bad practices in refrigerant servicing will increase.

8.11.3.3.3 Institutional framework and governance

3312. The important outcome of the training programme is in the creation of a core of trained personnel that has a capability to pass on their knowledge, skills and experience. The sustainability of this process depends on the availability of a sufficient institutional framework in particular in monitoring and continuation of training activities in the refrigeration sector. The refrigeration association would be an important tool in monitoring and dissemination of information on new environmentally viable technologies. Unfortunately, the law prevents registration of NGOs with membership less than 250 members. Currently, the number of refrigeration professionals willing to join the RA is not sufficient to meet this requirement.

3313. The ODS related curriculum was introduced in the local technical university, technical vocational schools and colleges.

8.11.3.3.4 Environmental

3314. The training of servicing technicians had a positive impact on the containment and reduction of emissions of CFCs into atmosphere. However, the CFC refrigerants still present on the market. The CFC based equipment is still primarily available in the domestic refrigeration sector. The CFC-12 –based outdated and leaky commercial refrigeration equipment is located mostly in State-owned and insufficiently financed institutions. There is no incentive to pursue refrigerant containment policies, and little finance prevents the replacement of this out-dated equipment with new non-ODS based systems. The poor state of the economy is likely to result in a demand for CFCs from this equipment over the next 3 to 4 years. The risk of non-controlled use of CFCs could be at least partially alleviated through the centrally coordinated and funded continuation of training activities.

3315. The sustainability of the outcomes of the UNEP training project is uncertain.

8.11.3.4 Catalytic role

3316. The project has a certain replication effect. The servicing companies, which were beneficiaries of the training project, supposedly use the core of trained technicians to continue the hands-on training of newcomers. The latter, however, could not be verified in the absence of monitoring system. The opportunity for the replication of the effect of the training programme would be much more encouraging had the Refrigeration Association been established and the legislation requiring mandatory qualification of servicing personnel adopted.

8.11.3.5 Achievement of outputs and activities

3317. The achievement of outputs and activities is analysed in the Section: Attainment of objectives and planned results. The first eleven planned outputs were achieved. The outputs 12: Continuation of hands-on training in refrigeration servicing industry and 13: Development and promotion of a regulatory framework for the refrigeration sector which will enforce good maintenance and servicing practices were not achieved.

3318. The Phase I Train-of-Trainers resulted in training and certification of 15 instructors versus the targeted 25 refrigeration trainers. However, 15 instructors proved to be sufficient to accomplish Phase II training. The Phase I was completed in June 2001 as planned. Altogether 380 trainees participated in Phase II, including 179 servicing technicians and 201 students in technical schools. Phase II was completed in May 2004 with about two years of delay against the implementation schedule.

8.11.3.6 Assessment of Monitoring and Evaluation Systems

8.11.3.6.1 M&E design

3319. The training component was managed by UNEP DTIE office in Paris. The NOU has exercised the coordination and reporting functions. The monitoring of the implementation by UNEP DTIE mainly relied on NOU reports by recording the number of technicians trained. However, the number of trained technicians is not a far-reaching indicator. The analysis of limitations of the M&E design in the IS Project was discussed in the relevant section. The same limitations are applicable to the analysis of the M&E design of the UNEP training component. The shortcomings of general nature in the M&E design have been identified by mid-term evaluation team. In particular, the report called to review and determine the adequacy of performance indicators (PIs) where they exist and assign PIs where they don't exist. The 2005 UNEP Project Implementation Reports (PIR) indicated to similar problems.

3320. The project proposal put forward the ODS phase-out target of the training program to be 6.53 ODP tonnes phase out. The introduction of good practices in the refrigerant management has definitely contributed to the ODS overall phase-out. However, the attribution of the training programme to the reduction of ODS emissions requires knowledge of the baseline and specific data on post-training level of ODS use in the sector. The practical use of knowledge transmitted through training has not been monitored and documented once the training was accomplished. UNEP DTIE did not develop and employ the appropriate methodology to determine the baseline, performance indicators and progress achieved through the training of servicing personnel in terms of relevant reduction in ODS consumption.

8.11.3.6.2 M&E plan implementation

3321. The internal monitoring of the training activities had been conducted by the MENR, NOU staff and local consultants. The overall monitoring functions were part of working responsibilities of UNEP DTIE. In its 2005 PIR, UNEP pointed out to reporting problems of the NOU in general but not specifically in regard to the training programme. The 2003 and 2005 PIRs limited to keep the record of the number of refrigeration technicians that were trained in each reporting period.

8.11.3.6.3 Budgeting and Funding for M&E activities

3322. The budget in the training project proposal did not have provisions for funding M&E activities. No information was provided by UNEP DTIE or DGEF on the amount funded for monitoring and evaluation activities for the training sub-project.

8.11.3.6.4 Long-term Monitoring

3323. It was envisaged in the project document that upon completion of the project, the long term monitoring of outcomes of the training component would be the responsibility of the Government and the NOU. Currently, such a monitoring is not in the agenda of the NOU. In the long-term, the monitoring of outcomes of the training programme might be included in the HPMP which has been developing in Turkmenistan with the assistance from the MLF.

8.11.3.7 Assessment of processes that affected attainment of project results

8.11.3.7.1 Preparation and readiness

3324. The UNEP training programme was designed in two phases: Phase I "Train-the Trainers" and Phase II training of servicing technicians. Such a design was applied in many training projects implemented by UNEP in Article 5 countries with assistance from the MLF and proved to be cost-effective and efficient.

3325. At the preparation stage, the NOU and the local consultant prepared the training module based on the Russian version of the UNEP manual "*Good Practices in Refrigeration*". This material was later translated into the Turkmen language. The training module covered issues of ozone layer depletion and protection, as well as technical information on ODS and non-ODS refrigerants, lubricants, good maintenance, servicing and repair of different type of refrigeration equipment, recovery and recycling of refrigerants, retrofitting options and practices, and future technological development in the refrigeration and air conditioning sector.

3326. The UNDP recovery and recycling project design includes also a training component. The UNDP training syllabus had many elements that are similar to the UNEP training module. 64 participants attended three UNDP training workshops. Many of these trainees also participated in the UNEP training programme. It appears that two agencies had two separate sets of training courses resulting in duplication of their efforts. More close cooperation between UNEP and UNDP in management and timing of their respective training programmes might have brought savings in resources.

3327. The application of good servicing practices requires modern tools and equipment that have been procured under the UNDP project "Recovery and recycling of ODS refrigerants in the air-conditioning and refrigeration sector". Altogether 31 servicing kits have been delivered together with recovery and recycling equipment to six major servicing companies. Majority of trainees in the UNEP training programme have not received needed servicing tools and equipment that diminishes the efficiency of training.

3328. It appears that the design of the training project in Turkmenistan and the coordination of its implementation between UNEP and UNDP have a room for improvement.

8.11.3.7.2 Country ownership and motivation

3329. The training programme for refrigeration servicing technicians was part of the Country Programme approved by the Government. Turkmenistan supported UNEP training activities at a government and enterprise level. Many Governmental officials attended the Phase I training course. The number of refrigeration technicians trained is very close to the target established in the Country Programme. The role of the Ministry of Education was pivotal in incorporation of ODS training module into curricula of Polytechnic Institute and technical schools.

3330. However, the Government did not support the inclusion of refrigeration servicing into the list of professions that require qualification and licensing under the recently approved Law on Licensing. The lack of such legislation discourages unqualified technicians to seek the training.

8.11.3.7.3 Stakeholder involvement

3331. The NOU involved the refrigeration servicing business for selection of potential trainees among the registered companies. The following concerned parties have been involved in the implementation of the training project: the MNP, the State Customs Office, State Stock Exchange, two state servicing companies in the domestic and commercial refrigeration sector, the Committee of Standardization, the Ministry of Education and staff from some educational institutions.

3332. Relevant NGOs do not exist in Turkmenistan. The role of the Refrigeration Association would be particularly valuable for assisting with the delivery of the training programmes among entities not covered by the implemented programme. Unfortunately, the Refrigeration Association cannot be established according to acting regulations.

8.11.3.7.4 Financial planning

3333. The budget provided funds for all activities necessary for the implementation of the training programme. Financial planning of the programme, however, was not efficient. There were administrative delays with disbursement of resources because of confusion with the source of funding. The project document was made available to the NOU with three years delay. The planned activities had been postponed and implemented behind the timetable established in the project document. The Phase 1 was accomplished in June 2001. The Phase 2 had been implemented from September 2001 until May 2004.

8.11.3.7.5 UNEP / UNDP Supervision and backstopping

3334. UNEP DTIE was responsible for the supervising of the training programme since its inception. All of the monitoring and supervision of the training programme were provided on the basis of quarterly financial and half-yearly substantial NOU reports. Such a supervision modality was not effective, especially in Turkmenistan because of administrative problems. There were also a frequent rotation in UNEP DTIE staff responsible for CEIT projects and communication barriers.

3335. There were no field visits to Turkmenistan by UNEP DTIE staff. UNEP DTIE and DGEF organized a meeting in Paris in April 2004 which helped to streamline the reporting and financial problems.

3336. UNEP as a supervisory agency was not forthcoming as much as necessary to ensure the better coordination with UNDP in combining training activities under UNEP training and UNDP recovery and recycling project. More close coordination could avoid duplication in training curricula and save resources.

8.11.3.7.6 Co-financing and Project Outcomes & Sustainability

3337. The co-financing was not a requirement for the implementation of the planned training activities. The sustainability of the achieved outcomes was directly related to continuation of the training program upon completion of the project and required the full cooperation of the Government and public institutions.

8.11.3.7.7 Delays and Project Outcomes & Sustainability

3338. There was a delay of about two years in the completion of the project. These delays happened in the critical time when Turkmenistan was in non-compliance with MP requirements and ODS consumption was growing. Finally, all the training activities had been accomplished. The risk in sustainability of outcomes of the project relates to weak Government commitments to secure the monitoring and continuation of training activities.

8.11.3.8 Project ratings

3339. The ratings of the training project is rated according to categories and criteria specified in Annex 1 Terms of Reference of the evaluation. The ratings are presented in Table 68.

Table 68: Ratings for the training project in Turkmenistan

Criterion	Evaluator's Summary Comments	Rating
Attainment of project objectives and results (overall rating)	Not all the project objectives were attained	**MS**

Criterion	Evaluator's Summary Comments	Rating
Effectiveness	The target in terms of trained technicians was almost met. Good servicing practices have been introduced into routine operation of beneficiary servicing workshops. The targeted reduction in CFC consumption cannot not be verified due to the lack of methodology. The introduction of legislation on mandatory qualification of servicing personnel and establishing the Refrigeration association were not accomplished.	**MS**
Relevance	All project outcomes are fully consistent with national priorities and GEF strategy in ozone focal area.	**HS**
Efficiency	It is not possible to measure the impact of the training programme in terms of ODP tonnes phased out. The efficiency assessed in US$ spent per a trainee is about average. The project was implemented with delay of about two years.	**MS**
Sustainability of Project outcomes (overall rating)	The ongoing demand for CFC refrigerant and poses the moderate risk to the sustainability of outcomes of the training programme.	**ML**
Financial	Once the training programme was completed, there was no financing by the Government to continue and expand the training activities in the refrigeration servicing industry.	**ML**
Socio Political	The Government provided support during the implementation of the project. There are no Government commitments to continue the training activities. The necessary qualification legislation was not adopted.	**ML**
Institutional framework and governance	The ODS-related curriculum was introduced in the local technical schools. The lack of institutional framework in monitoring and continuation of training activities poses risk to sustainability.	**ML**
Environmental	The existing high demand for ODS refrigerant and inappropriate handling of CFC refrigerant by untrained personnel create the risk to the environment.	**ML**
Achievement of outputs and activities	The major planned outputs and activities have been accomplished albeit with delay. The necessary regulatory framework was not established. The continuation of training is questionable.	**MS**
Monitoring and Evaluation (overall rating)	The monitoring and evaluation system does not appear to be adequate to measure the level of success of the training programme.	**MS**
M&E Design	The existing M&E design requires serious improvements in terms performance indicators and methodology for the	**MS**

Criterion	Evaluator's Summary Comments	Rating
	evaluation of outcomes.	
M&E Plan Implementation (use for adaptive management)	The implementation of M&E Plan was reduced to the review of quarterly and semi-annual reports submitted by the NOU to UNEP DTIE. The face-to-face discussion between NOU and UNEP DTIE was organized at the time of completion.	**MS**
Budgeting and Funding for M&E activities	There were no budget allocations for M&E activities.	
Catalytic Role	The project had a certain replication effect since hands-on training continued in companies-beneficiaries once the project was terminated.	No ratings are requested for the catalytic role.
Preparation and readiness	The project design is consistent with many similar training projects implemented by UNEP. The design can be improved by coordinating with UNDP recovery and recycling training component and by increasing the number of servicing kits procured and distributed. The NOU was well prepared to the start of training.	**MS**
Country ownership / commitments	The Government was supportive during the implementation of the project. The key legislation on licensing of the servicing technicians was not approved. There are no commitments on monitoring and continuation of the training.	**MS**
Stakeholders involvement	The project involved all relevant stakeholders in project preparation and execution. The Refrigeration Association is yet to be established.	**MS**
Financial planning	Financial planning of the programme, however, was not efficient causing delays in the implementation.	**MS**
UNEP Supervision and backstopping	Supervision was reduced to reviewing NOU reports.	**MS**
Overall Rating	Not all the objectives of the project were met.	**MS**

8.11.4 TUK//98/G35 - National programme for recovery and recycling of ODS refrigerants (UNDP/UNOPS);

8.11.4.1 Background

3340. From the 1996 survey, the total ODS consumption in the refrigeration servicing sector was estimated to be 31.1 ODP composed of 29.6 ODP tonnes of CFC-12 and 1.5 ODP tonnes (27.2 metric tonnes) of HCFC-22. In the domestic refrigeration sector, 20.6 ODP tonnes of CFC-12 consumption was associated with servicing and repair of about 20,000 units annually out of 0.47 million units of total population of domestic refrigeration appliances. The annual frequency of repair of domestic refrigerators represented 4.4% that was only about a half of likely repair

frequency of 10% applied by TEAP for Article 5 countries.[552] It appears that about 50% of domestic appliances in the country had not been used and, therefore, repaired at the time of the survey most probably for economic reasons. Consequently, the demand for CFC-12 has been estimated at much lower level than it could be under other circumstances. The demand and imports of CFCs increased in 2001, 2003 and 2004 significantly exceeding 1996 consumption (see Figure 45) that can be associated with the recovery of economy in Turkmenistan.

3341. In the commercial refrigeration sector, the ODS consumption for servicing was composed of 9.0 ODP tonnes of CFC-12 and 1.5 ODP tonnes (27.2 metric tonnes) of HCFC-22. The total number of commercial refrigeration equipment was estimated of 9,790 units. The survey does not provide information on the number of units equipped with CFC-12 and HCFC-22 systems. The number of CFC-12 units that required repair and servicing was 2,349 units consuming about 9.0 ODP tonnes of CFC-12.

3342. The ODS phase out in the refrigeration servicing sector requires a systematic approach based on a comprehensive, multi-faceted strategy aiming at establishing the proper sequencing of projects and policies that proceed in a coordinated way. The RMP served as a strategic document for ODS phase out activities in the most important refrigeration servicing sector. The recovery and recycling of ODS refrigerants was among the priorities identified by the Government in the Turkmenistan Country Programme. Accordingly, UNDP prepared the project on the implementation of the national programme for recovery and recycling (R&R) of ODS refrigerants to be implemented together with UNOPS.

3343. The refrigerant recovery involves the removal of the refrigerant in vapour or liquid form for reuse or storing in an external container for subsequent recycling or destruction without testing or processing it. The refrigerant recycling means to process the contaminated refrigerant through oil separators and filter dryers using a recycling machine working predominantly at a local service shop. The refrigerant reclamation requires that the contaminated refrigerant be reprocessed using evaporation, segregation and distillation operations to meet new product specifications. The reclamation infrastructure represents a significant investment and may only be economical for large quantities of recovered refrigerant. In Turkmenistan, reclamation equipment was not part of the UNDP project.

8.11.4.2 Attainment of objectives and planned results

8.11.4.2.1 Objectives, outputs, outcomes and performance indicators

3344. The objectives of the UNDP R&R project were to assist the Government in phasing out consumption of CFCs by 2003 as established in the Country Programme and the RMP for Turkmenistan. The GEF allocated funds amounted to $139,772. The ODS phase out target of the program was determined to be 7.53 ODP tonnes. The R&R Project aimed to provide a number of portable refrigerant recovery machines, including refrigeration servicing kits, and manual recovery pumps with plastic storage bags. The project also provided several sets of recycling equipment strategically distributed around the country. Training/demonstration seminars for technicians performing repairs, maintenance and installation of refrigeration and air conditioning equipment were important to familiarize all involved with the RMP, the National Recovery and Recycling Programme and good servicing practices.

3345. The outcomes were defined as introduction of refrigerant recovery and recycling practices throughout out the country, resulting in the decrease of national CFC demand and the reduction of ODS emissions into the atmosphere. The outputs were defined as follows: delivery of the necessary R&R and servicing equipment to selected refrigeration servicing workshops; training of refrigeration technicians; lending technical support and provision of technical information to trainees; demonstration of recovery and recycling procedures and good servicing practices to refrigeration technicians. The NOU and the national consultant took responsibilities for monitoring the recovery and recycling operations. The logframe matrix incorporated in the UNDP project brief is not detailed enough for the evaluation of the R&R project and its monitoring component. The performance indicators were inferred from the outputs/deliverables contained in the UNDP project documents (Table 69).

[552] 1998 TEAP RTOC Report

Table 69: ODS Recovery and Recycling Programme: Objectives/ Intended Results - Outputs/Deliverables - Outcomes/Performance indicators

Objectives/Intended Results	Outputs/Deliverables	Outcomes/Performance indicators
1. Introduction of sustainable refrigerant containment and R&R practices and reduction in ODS emissions into the atmosphere 2. Reduction in CFC demand to meet CFC phase out 2007 and 2010 targets established in the Montreal Protocol	1. Procurement and delivery of servicing, and recovery and recycling equipment to the country 2. Development and promotion of legislation supporting R&R operations 3. Development and distribution of R&R manuals 4. Selection of participants and conducting training/demonstration workshops on good servicing and R&R practices and certification of graduates 5. Distribution of R&R and servicing equipment among servicing workshops 6. Establishing a R&R monitoring system 7. Reporting R&R results	1. Adoption of legislation supporting R&R operations 2. Establishment of ODS recovery and recycling system in the refrigeration and air-conditioning sector 3. Attainment of ODS phase out targets through the reduction of demand and use of recovered and recycled ODS in the servicing sector • Timely adoption of ODS imports licensing and quota system • Proper timing in procurement and delivery of R&R equipment (Q3/1999) ; • Preparation and translation of R&R training materials; • Number of R&R trained and certified refrigeration technicians (60 technicians) ; • Number of R&R machines distributed to servicing workshops; • Increase in CFC prices in relation to substitutes; • Timely commencement of R&R operations (Q4/1999); • Quantity of ODS recovered and recycled (7.53 ODP tonnes annually); • Adoption of legislation promoting recovery and recycling operations; • Economic cost/benefits of adopted R&R programme; • Availability of R&R monitoring system during and after the project; • The availability of R&R data in the NOU and UNDP.

8.11.4.2.2 Effectiveness

3346. A survey, conducted by the Ministry of Nature Protection of Turkmenistan in 1998, indicated

that there were more than 410 refrigeration technicians in the country. The survey also indicated that there were 66 companies of different sizes in the country that carried out servicing, maintenance and repair of domestic, commercial and industrial refrigeration equipment, some of them also serviced air conditioning units. Through the funding provided by the GEF the following equipment was purchased: 3 sets of recovery and recycling machines, including vacuum pumps for handling storage cylinders and refrigerant identifiers; 31 refrigerant recovery machines; 31 servicing kits including refrigerant cylinders, manifolds, hoses, tools and accessories, electronic leak detectors and weighing scales. Spare parts were included in the delivery package.

3347. The delivery of equipment by UNOPS was done according to the implementation schedule in two months after the approval of the project document and arrived to Ashkhabad in August 1999. The NOU with assistance from the local consultant selected potential beneficiaries among registered servicing workshops and refrigerant distributors on the basis of their pattern and quantities of CFC refrigerants used in their servicing operations. Since the arrival of the international consultant was delayed, the NOU distributed the equipment among selected beneficiaries. Two major state servicing companies working in domestic ("Rembyttechnica") and commercial ("Turkmentorgservice") refrigeration sectors received 6 and 21 sets of recovery and servicing equipment respectively. Turkmentorgservice provided part of its equipment to two regional workshops. Two private companies in Ashkhabad received four remaining sets.

3348. The NOU with assistance from the local and international consultant held three training/demonstration workshops on 10, 13 and 14 March 2000. The training curriculum included the following topics: The theory of Ozone Layer and impact of CFC emissions; The production and supply trends of ODS refrigerants (CFC-11, CFC-12, R-502, HCFC-22); Proper and safe handling of CFC refrigerant; Recovery, Recycling and Reclamation of ODS; Good ODS containment practices in servicing the refrigeration equipment (refrigerant recovery procedures, methods of evacuation of systems before recharging, prevention and early detection of leaks. Hands-on training followed demonstrating the work of the supplied recovery and recycling equipment in servicing different refrigeration systems. Altogether, 60 servicing technicians received training and were certified for conducting servicing and R&R operations.

Figure 46: Recovery and recycling centre in Turkmenistan

3349. Two refrigerant recycling centres have been established in Turkmentorgservice which received two recycling machines and Rembyttechnica with one recycling machine in Ashkhabad (Figure 46).

3350. The recovery and recycling operations started four months behind schedule due to delays with the commencement of training workshops. The target for recovered refrigerant was estimated at 6.53 ODP tonnes per year in the project document on the bases of recovery of one kg of refrigerant per day by each of 31 recovery machines with 270 working days and 90% recovery rate. The important factor of reachable quantities of refrigerant was not properly taken into account when UNDP was establishing such a high target. The 1996 survey demonstrated that 20.6 and 9.0 ODP tonnes were used for servicing domestic and commercial units respectively.

3351. Notwithstanding that a substantial number of CFC-12 based domestic appliances still present in the country, the major source of CFC-12 is commercial and industrial refrigeration units. These units usually contain much larger charge of CFC-12 than that contained in domestic refrigeration equipment. The energy supply is not stable in Turkmenistan. Severe voltage fluctuations damage prematurely electric motor winding and burn the compressor in domestic refrigeration appliances. The resulted chemical reactions contaminate the refrigerant beyond the capability to be purified through the recycling process. Similar situation has been observed in many Article 5 countries. Thus, in Brazil, about 90% of domestic refrigerators coming for repairs have their

compressors burned and refrigerant heavily contaminated.[553] All these factors show that the target for recovered refrigerant was grossly overestimated.

3352. The evaluator visited Turkmentorgservice in Ashkhabad. The management of this largest state owned servicing company clarified that currently although the CFC based equipment is still available in the domestic refrigeration sector, the share of CFC-12 consumption is not significant. The potential refrigerant recovery rate in this sector is intrinsically very low. Currently about 90% of CFC-12 consumption in Turkmenistan is for servicing the commercial and industrial refrigeration units.

3353. The data on quantities of recovered and recycled CFC-12 are presented in Table 70. The data for the period after 2002 were not available from the NOU.

3354. The prices for CFC-12 increased insignificantly from $4.0-5.0/kg in 2004 to $5.0-7.0 in 2008 depending on the origin and quality. These prices are not high enough to make R&R operations profitable for servicing enterprises especially when State-owned end-users are involved that cannot be charged above artificially established low rates.

3355. The R&R program was not very successful. The total quantity of CFC-12 recovered for the 32 months duration is equivalent to 910 kg ODP per year which is much lower than the target of the project of 6.53 ODP tonnes. It appears that R&R programme has not contributed noticeably in the ODS phase out in Turkmenistan.

Table 70: Quantity of recovered and recycled CFC-12 (April 2000 –November 2002) in Turkmenistan

Refrigeration Servicing Company	Ownership	Location	Recovered (Kg ODP)	Recycled (Kg ODP)
Turkmentorgservice	State	Ashkhabad-City	1670	571
Turkmentorgservice	State	Turkmenabat-City	182	0
Turkmentorgservice	State	Dashoguz-City	53	0
Rembyttechnica	State	Ashkhabad-City	230	0
Technoklimat	Private	Ashkhabad-City	168	0
B. Joraev	Private	Turkmenabat-City	120	0
Total			**2423**	**571**

3356. The final evaluation report prepared by the NOU and UNDP international consultant identified the shortcomings of the project that were primarily associated with the weakness of the legislative system. The refrigeration equipment end-users have not been motivated to use non-CFC refrigerants. The late introduction of CFC imports quota resulted in the abundant stockpile of CFCs and availability of low priced virgin CFCs in the market in comparison with ODS-free alternatives that undermined the economy of R&R operations.

3357. The efficiency of the programme would have been increased if the quota on CFC imports was introduced as planned in the Country Programme. The lack of financial incentives for promotion of non-ODS alternatives and mandatory qualification of servicing technicians are also lost opportunities in supporting the R&R programme.

8.11.4.2.3 Relevance

3358. The R&R programme is in the list of priorities in the Country Programme approved by the Government. The R&R programme is fully consistent with the GEF strategy in the ozone focal area. The recovery and recycling operations contributed to the reduction of ODS emissions into the atmosphere. Since most CFC refrigerants are also greenhouse gases, the decrease of ODS emissions was a factor in the reduction of the threat of global warming, bringing certain benefits

[553] MLF Report on Evaluation of Management, Monitoring and Verification of National Phase-out Plans in Non-low-volume-consuming Countries, Case Study Brazil, March 2008

to the climate.[554]

8.11.4.2.4 Efficiency

3359. The timetable of the R&R programme reflected the requirement to contribute to the achievement of zero CFC consumption in 2003. The start of R&R operations was delayed for three months. This delay, however, was not critical given the insignificant impact of quantities of recovered CFCs in comparison with the CFC consumption in 2000 to 2004.

3360. The project incremental cost was determined to be $128,231. The cost-effectiveness of the project was assessed by UNDP to be $17.02/kg ODP assuming the annual quantities of recovered ODS to be 7.53 ODP tonnes.. The actual cost-effectiveness can be calculated using actual annual average of ODP tonnes recovered and reused for 32 months operation. The average amount of annual ODP phase out will be 910 kg ODP tonnes resulting in cost-effectiveness of $140/kg ODP. The actual cost-effectiveness is about eight fold poorer than the target.

3361. The efficiency of R&R operations can also be assessed by calculating the percentage of recovered and reused refrigerants to the total ODS consumption in the refrigeration servicing sector. The quantity of recovered CFC-12 during 32 months in 2000 to 2002 constituted about 3% of the consumption in the refrigeration servicing sector within the same period. The targeted recovered CFCs represented about 25% of the 1996 CFC consumption in refrigeration servicing sector. Another efficiency indicator, the annual quantities of recovered and recycled ODS per each recovery and recycling machine are calculated to be about 30.2 kg and 71 kg of ODS per machine per year respectively. The calculated value of avoided imports of new ODS refrigerants is $12,115 for 32 months based on the local price of $5.0/kg of CFC-12.

8.11.4.3 Assessment of Sustainability of project outcomes

8.11.4.3.1 Financial resources

3362. The funding of the project by UNDP stopped in 2002. Since then, the financial sustainability of R&R operations was dependent on its profitability determined by several economic and technical factors. The management of the State Servicing Company explained that reachable quantities of refrigerants in the domestic refrigeration sector are not significant because of low charge and frequent burn out of compressors causing severe contamination of the refrigerant. The technically reachable and recyclable quantities of CFC-12 in commercial refrigeration units are also very limited because of high leakage rate in the old and warned out equipment especially ones fitted with open-type compressors. The virgin CFC-12 refrigerant is available on the market for relatively low price. Spare parts for recovery and recycling machines were either not available or when available they were very expensive. The Company experiences strong competition from non-organized individual servicing entrepreneurs. All these factors made recovery and recycling not cost-effective. Therefore, the motivation for continuation of R&R operations after the closure of the project was not very high reducing the sustainability of the project.

8.11.4.3.2 Socio-political

3363. The socio-political climate in the country is changing. The Ministry of Nature Protection is striving to play more prominent role in the Governmental hierarchy and strengthening working relationships with other stakeholders.

3364. In the servicing refrigeration sector, however, the situation has been deteriorating. The personnel in Turkmentorgservice have been reduced from 50 to 15 technicians. Many trained and qualified personnel left the country looking for better opportunities. They have been replaced mostly with non-qualified individual servicing entrepreneurs. In the absence of qualification legislation, the socio-political risk to the sustenance of the project is growing.

8.11.4.3.3 Institutional framework and governance

3365. The Government and the NOU provided the support to the project during the first two years. After the closure of the project, the monitoring and other support to the recovery and recycling

554 IPCC/TEAP Special Report on Safeguarding the Ozone Layer and the Global Climate System, 2005

operations was virtually discontinued. In return for receiving the equipment, the servicing companies were required to report on the quantity of refrigerant recovered and recycled. However, this provision was not reinforced. The legislation on banning the venting of ODS refrigerants and mandatory recovery and recycling is not in the agenda of the Government.

3366. The Government is committed to support decisions of the Parties to the Montreal Protocol in regard to the accelerated phase out of HCFCs. The Government is closely cooperating with UNDP and UNIDO on the development of the national strategy on this matter. The recovery and recycling of HCFC refrigerants will be a component of this national strategy. The existing set up of the Ozone Office within the Governmental structure and good likelihood of continuation of financial support of the NOU from the MLF provide opportunities for strengthening of legal framework and policies in regard to ODS phase out that would be beneficial for the sustainability of the outcomes of the R&R project.

8.11.4.3.4 Environmental

3367. The CFC based equipment is still available in the domestic refrigeration sector where the potential refrigerant recovery rate is intrinsically very low. The CFC-12 –based outdated and leaky commercial refrigeration equipment is located mostly in State-owned and insufficiently financed institutions. The leakage rate in these equipment ranges from 20% to 100% of the initial refrigerant charge. End-users have little finance to replace this out-dated equipment with new non-ODS based systems. There is no incentive to pursue refrigerant containment policies, including R&R unless the price of CFC-12 is increased markedly. The poor state of the economy is likely to result in a demand for CFCs from this equipment over the next 3 to 4 years reducing the sustainability of the outcomes of the project.

8.11.4.4 Catalytic role

3368. There are very rear cases of purchasing of R&R equipment by refrigeration technicians on their own because of their low income and high cost of equipment. In the absence of the qualification and licensing regulations, there are no requirements for having recovery and recycling equipment for new companies entering the refrigeration servicing business. Economic considerations are the only factor that would stimulate servicing enterprises in purchasing R&R equipment. The cost of this equipment and subsequent economic opportunities, however, are not particularly favourable at this point of time. The growing use of HFC refrigerants that are much more costly may change the situation.

8.11.4.5 Achievement of outputs and activities

8.11.4.5.1 Delivered outputs

3369. The planned outputs as identified in Column 2 Table 4 have been achieved as follows:

- Procurement and delivery of servicing, and recovery and recycling equipment to the country;
- Development and distribution of R&R manuals;
- Selection of participants and conducting training/demonstration workshops on good servicing and R&R practices and certification of graduates;
- Distribution of R&R and servicing equipment among servicing workshops;
- Establishing a R&R monitoring system for the period of project duration;
- Reporting R&R results.

3370. The NOU and the Government were not successful in development and promotion of legislation supporting R&R operations. The Effectiveness section provides detailed account of quantity, quality and usefulness of delivered outputs.

8.11.4.6 Assessment of Monitoring and Evaluation Systems

8.11.4.6.1 M&E design

3371. The training component was managed by UNDP Montreal Protocol and UNOPS. UNDP delegated the overall monitoring of the project to the NOU in its capacity as a co-ordinator of all activities related to the Montreal Protocol in the country. The NOU was responsible for keeping records of

3372.

- The recovery machines are distributed according to criteria of maximum recovery of CFCs;
- All the equipment is properly used, kept and maintained;
- Proper records of the amounts of CFC recovered, recycled and reused are maintained.

3373. The title of ownership of the machines and equipment provided under the Global Environment Facility will be kept by the Government throughout the duration of the project and then transferred to the users. The transfer will be subject to final evaluation of the activities carried out by the individual users.

8.11.4.6.2 M&E plan implementation

3374. The NOU recruited the national consultant who collected data on CFC quantities recovered and recycled for the period April 2000 to November 2002 in Ashkhabad and in the regions. The data were submitted to UNDP as part of the final report on the implementation of the project.

3375. One year duration of the monitoring cannot ensure that the collected data are consistent and representative. One year period is also too short to ensure that R&R equipment is well kept and maintained. The evaluator was advised that there is lack of spare parts and some tools and equipment are not of good quality (most of leak detectors were out of order within the first year of use).

3376. The M&E design has very limited quantitative performance indicators. The major one was the number of R&R machines to be delivered. The quantities of recovered and recycled ODS, and the cost-effectiveness have been assessed using wrong assumption and proved to be impractical. The following performance indicators could be added providing more enlightening information: 1) the annual utilization rate of recovery and recycling machines is terms of kg of ODS recovered/recycled per machine; 2) the percentage of recovered and reused refrigerants to the total ODS consumption in the refrigeration servicing sector; and 3) the calculated value of avoided imports of new ODS refrigerants in $ terms. The availability of this additional information would be helpful in optimizing the R&R system and making it more efficient.

8.11.4.6.3 Budgeting and Funding for M&E activities

3377. There is no specific budget line for the monitoring component in the project proposal document. The amount of $1,282 was included in the budget for support services by the local office. There was also a further $6,000 allocated for the Project Completion Mission by an international consultant. The assessment team did not have access to financial documents since the focus of the assessment was on the outcomes and impact of the sub-project.

8.11.4.6.4 Long-term Monitoring

3378. The M&E plan of the R&R project envisaged only one year of monitoring. The long term monitoring was assigned as a responsibility of the Government once the project was terminated. The long-term monitoring of ODS recovery and recycling counts on the Government commitments to introduce legislation promoting R&R operations and resources that would ensure the reinforcement and monitoring of these activities. Currently, there are no indications that the Government is preparing to introduce the new legislation or allocate resources for the long-term monitoring.

3379. There is a high likelihood of extension of the institutional strengthening support from the Multilateral Fund in relation to the Government commitments to accelerate the phase out of HCFCs. The monitoring of HCFC recovery and recycling activities would appear to be one of responsibilities of the NOU in the coming future.

8.11.4.7 Assessment of processes that affected attainment of project results

8.11.4.7.1 Preparation and readiness

3380. By the time of the implementation of the R&R project in Turkmenistan, UNDP gained substantial experience in the implementation of R&R activities in Article 5 countries. The Government identified R&R activities as an important tool in achieving ODS phase out within the Refrigerant Management Plan that was a part of the Country Programme prepared by UNDP and UNEP. The strategy was to start the R&R activities as soon as possible to maximize their contribution to the reduction of ODS consumption in the refrigeration servicing sector. UNDP started preparatory work immediately after the project approval and allocation of funding by the GEF. The R&R equipment was delivered within three months after the approval of the project. The Government encouraged the early start of the project by effective customs clearance of delivered equipment.

3381. The Government, however, was not very efficient in timely adoption of quota system to control imports of CFCs that would create favourable environment for R&R operations. The quota system was introduced in 2005 six years after the project approval.

3382. The R&R project design has the training component while UNEP implemented its separate training project. The curricula of two training programmes contain many similar elements. The curricula of the R&R training component incorporated quite a lot of information and on-hand demonstration of good servicing practices. Both training programmes could be effectively merged bringing resulting in savings of resources. Such an approach would result in interdependency of two agencies and require more close coordination and partnership. In reality, however, the implementation of the training programme by UNEP in Turkmenistan experienced serious delays that would have put at risk the success of the R&R component.

8.11.4.7.2 Country commitment

3383. The R&R activities were included in the RMP as part of the Country Programme approved by the Government as a tool in achieving complete ODS phase out by January 2003. It was anticipated that the early introduction of R&R practices would result in sizable reduction in the demand of imported CFC refrigerants. It was understood also that once CFC imports stopped in 2003, the recycled CFC would be the only alternative source of CFC-12 refrigerant in the country for maintaining the existing refrigeration equipment. The project design was fully in line with the national plans and Government commitments to meet the Montreal Protocol targets established for Turkmenistan.

3384. The Government through the NOU provided support to the implementation of the R&R project in terms of organizing training, certification of trainees, distribution of equipment and assisting in short-term monitoring of the progress.

3385. In the Country Programme, the Government committed to introduce the following policies in support of R&R operations and enhancing their impact: the introduction of the ODS import license and quota system, excise taxes on imported of ozone-depleting substances and the ban on imports of ODS containing equipment in 2003-2004. The Government managed to meet their commitments only partially. The ODS import quota system was introduced in 2005. The rest of expected regulatory measures have not occurred.

8.11.4.7.3 Stakeholder involvement

3386. The project involved key stakeholders such as UNOPS/UNDP, Government institutions, NOU, national consultants. The refrigeration servicing industry especially Turkmentorgservice and Rembyttechnica were the major player in the implementation and monitoring of the R&R project. Additionally, it was expected that the Refrigeration Association would have been established to support the outcomes of the project. However, these expectations did not materialize. The beneficiaries of the R&R programme were outreached by the NOU through awareness campaign, involvement of the Refrigeration Association and training/demonstration workshops. The NOU and national consultant provided final report on quantities of recovered and recycled ODS and the operation of the R&R system to the UNDP headquarters. The final evaluation mission was performed by UNDP in 2003.

8.11.4.7.4 Financial planning

3387. The budget for the R&R project amounted to $139,772, including $10,259 as the agency overhead costs. The budget included allocations for procurement of the R&R equipment, conducting of training/demonstration workshops, one year monitoring and final evaluation. The procurement and delivery of equipment was implemented by UNOPS. The control of expenditures was with the UNDP Montreal Protocol Unit and UNDP GEF Unit. The funding of training/demonstration workshops and the monitoring was organized through the UNDP local office and the NOU. There was no delay in flow of funds associated with procurement and delivery of equipment and the implementation of the training and monitoring components.

3388. The evaluation of financial accounts and financial audits was not part of the Terms of References for this terminal evaluation.

8.11.4.7.5 UNEP / UNDP Supervision and backstopping

3389. The implementation of the project was supervised by the UNDP Montreal Protocol Unit and the international consultant. The UNDP organized two missions of the international consultant to Turkmenistan for conducting training/demonstration workshops and the final evaluation. There were no other documents available to assess the level of supervision and support by UNDP

8.11.4.7.6 Co-financing and Project Outcomes & Sustainability

3390. There was no expected co-financing of the R&R project.

8.11.4.7.7 Delays and Project Outcomes & Sustainability

3391. The project experienced a 3-months administrative delay with the start of training/demonstration workshops. The impact of this delay could be assessed as a lost opportunity of recovering and reusing a quarter of the annual quantity recovered in 2002-2002. The missed quantity of recovered ODS would be about 227 kg of CFC-12. It is clear that three months delay was not critical for the sustainability of project outcomes. The R&R activities had a very little impact on the reduction in ODS consumption. The early approval of legislation on mandatory recovery and recycling and qualification of servicing personnel would be an important contribution to the sustainability of R&R activities.

8.11.4.8 Project ratings

3392. The Recovery and Recycling project is rated according to categories and criteria specified in Annex 1: Terms of Reference of the evaluation. The ratings are presented in Table 71.

Table 71: Ratings for the ODS recovery and recycling project in Turkmenistan

Criterion	Evaluator's Summary Comments	Rating
Attainment of project objectives and results (overall rating)	Most of project objectives were attained	**MS**
Effectiveness	The R&R system was established as planned. However, its effectiveness was poor in terms of quantities of recovered and reused CFC refrigerants mainly because of late adoption of ODS imports quota. The R&R activities had a very little impact on the reduction in ODS consumption.	**MS**
Relevance	All project outcomes are fully consistent with GEF strategy in ozone focal area. The objectives of the R&R project are incorporated into the Country Programme approved by the Government.	**HS**

Criterion	Evaluator's Summary Comments	Rating
Efficiency	The cost-effectiveness of the project was $128.0/kg ODP vs the target of $17.0/kg ODP. The percentage of recovered and reused refrigerants during 32 months in 2000 to 2002 was about 3% of ODS consumption in the refrigeration sector during the same period. The annual quantities of recovered and recycled ODS per each recovery and recycling machine are calculated to be about 30.2 kg and 71 kg of ODS per machine per year respectively. The calculated value of avoided imports of new refrigerants is $12,115 for three years based on the local price of CFC-12 in the respective year. The efficiency of R&R system was not high.	**MS**
Sustainability of Project outcomes (overall rating)	The probability of continuation of R&R operations is moderately high after the project funding ended in 2009.	**S**
Financial	The motivation for continuation of R&R operations after the closure of the project was low because of availability and low prices for CFC-12 on the local market.	**MS**
Socio Political	The socio-political climate in the country and the position of the Ministry of Nature Protection are improving. However, the socio-political risk to the sustenance of the project is high because of deterioration of the situation in the servicing sector and lack of support from the Government.	**MS**
Institutional framework and governance	The NOU has no means and resources to maintain the monitoring of R&R activities. The sustainability of the R&R system is related to the future support of R&R under the MLF programme on phase out of HCFCs.	**MS**
Environmental	The R&R activities will not be able to reduce markedly the demand for CFCs which will be maintaining in the next 3 to 4 years. However, the growing use of HCFC and HFC refrigerants will require continuation of recovery and recycling activities.	**MS**
Achievement of outputs and activities	The most outputs and activities have been accomplished except development and promotion of important legislation	**MS**

Criterion	Evaluator's Summary Comments	Rating
	supporting R&R operations.	
Monitoring and Evaluation (overall rating)	M&E system partially achieved its objectives	**MS**
M&E Design	The funding of the R&R monitoring for twelve months was not sufficient. The M&E design is lacking a number of quantitative performance indicators that would help to optimize the R&R system and enhance its efficiency. The monitoring of long-term outcomes by the Government was not successful.	**MS**
M&E Plan Implementation (use for adaptive management)	The M&E plan was implemented only in regard to for the short-term monitored. The monitoring of long-term outcomes by the Government was not successful.	**MS**
Budgeting and Funding for M&E activities	The budget of the monitoring covered 12 months expenses of the national consultant and the final evaluation mission. No documentation is available for the evaluation of the M&E budget and spending.	**S**
Catalytic Role	The cost of R&R equipment and subsequent economic opportunities are not particularly favourable for purchasing of R&R equipment by refrigeration technicians on their own.	No ratings are requested for the catalytic role
Preparation and readiness	The Government and the NOU provided support in the preparation of R&R activities. The approval of quota system was delayed for 3 years that had negative impact on the efficiency of the R&R programme.	**MS**
Country ownership /motivation	The R&R activities were included in the RMP as part of the Country Programme approved by the Government as a tool in achieving complete ODS phase out by January 2010. The Government through the NOU provided support to the implementation of the R&R project. The Government did not meet its commitments on approval legislation promoting R&R activities.	**MS**
Stakeholders involvement	The project involved all relevant stakeholders in project preparation and execution.	**S**
Financial planning	The budget was spent as planned. There was no delay in flow of funds associated with procurement and delivery of equipment and training.	**S**

Criterion	Evaluator's Summary Comments	Rating
UNEP Supervision and backstopping	In general, UNDP fulfilled its role as planned. The NOU has satisfied with UNDP supervision of the project.	**S**
Overall Rating	The project had moderate shortcomings in the achievement of its objectives	**MS**

12 Uzbekistan

8.12.1 Background

3393. Uzbekistan became independent from the Soviet Union on 1 September 1991. Since independence, the government has been committed to a gradual transition to a free market economy but has been cautious in moving to a market-based economy. It was difficult to accurately estimate economic growth after independence in Uzbekistan as government information on the economy tended to be politically motivated. More recently, Uzbekistan's GDP growth was estimated to be 9.5% in 2007 prior to the global economic downturn[555].

3394. In the mid-1990s, there was a significant demand for CFCs for refrigeration and air-conditioning as a result of increased company privatisation and expanded economy activity. Uzbekistan was not a producer or exporter of ODS, and at that time relied mainly on the Russian Federation for ODS supplies.

3395. The Republic of Uzbekistan acceded to the Vienna Convention and the Montreal Protocol on 18 May 1993; the London and Copenhagen Amendments on 10 June 1998; and ratified the Montreal and Beijing Amendments on 31 October 2006.

3396. In order to comply with the control measure requirements of the Montreal Protocol as a developed country, Uzbekistan was required to phase out of the consumption of halon on 1 January 1994; and to phase out CFCs, methyl chloroform and carbon tetrachloride on 1 January 1996. Although the reported consumption of CFCs had been reduced by about 76% in 1993 (585 ODPP-tonnes) compared to 1989 (2,455 ODP-tonnes), reported CFC consumption in 1996 was 260.3 ODP-tonnes, instead of zero. In 1998, the Parties to the Montreal Protocol noted the following benchmark commitments[556] by Uzbekistan:

- To reduce consumption of CFCs by 40% by 2000, by 80% by 2001, and to completely phase them out by 2002;
- To reduce consumption of carbon tetrachloride by 35% by 2000, by 67% by 2001, and to completely phase it out by 2002;
- To reduce consumption of methyl chloroform by 40% in 2000, by 82% in 2001, and to completely phase it out in 2002;
- To put in place in 1999, import quotas in order to freeze the imports at the current level and to support the phase-out schedule noted above;
- To put in place by 1999, bans on imports of ODS and equipment using and containing ODS;
- To put in place policy instruments and regulatory requirements to ensure progress in achieving the phase-out.

3397. The Parties in 1998 noted that Uzbekistan was working toward compliance by focusing on training in the refrigerant sector, and recovery and recycling of refrigerants. The Parties at that time foresaw the need for Uzbekistan to address with urgency a licensing and quota system to control the import of ODS.

3398. Uzbekistan reported in 1998 that it believed it would be in non-compliance until 2001. This subsequently proved to be the case as Uzbekistan reported CFC consumption in each year from

[555] IMF as quoted in US State Department.
[556] Decision X/28: Compliance with the Montreal Protocol by Uzbekistan

1997 until 2001. However, the consumption of Annex A Group 1 and Group 2 were reported by Uzbekistan to have been zero by the due date.

8.12.2 Generalised objectives, output and performance indicators

3399. The design of the UNEP and UNDP projects for Uzbekistan did not require clearly defined logframe analysis and prior agreed performance indicators (PIs) at the time of their formulation and approval. The 2004 Mid-Term Review undertaken for the UNEP-managed projects identified the issue of the absence of results-based management and accountability framework, including the lack of PIs in the UNEP sub-projects.

3400. In the absence of these PIs, project outputs and outcomes and PIs based were developed for this Terminal Evaluation Assessment, based on the results of the mid-term evaluation, the UNEP PIRs and achievements that became evident during the assessment of each of the sub-projects. Table 45 summarises these generalised objectives, outputs and outcomes that were used as a guide in the assessment of each of the sub-projects in the Uzbekistan country report[557].

Table 72: Generalised objectives, outputs and outcomes that were used as a guide in the assessment of each sub-project

Objectives/Intended Results	Outputs/Deliverables	Outcomes/Performance indicators
1. Strengthening of the national capacity to effectively coordinate and administer the actions outlined in the Country Programme and the Refrigerant Management Plan	1. Establishing the National Ozone Unit and initiating actions that created a suitable climate in the country for the expeditious phase-out of ozone-depleting substances (ODS) 2. Political priority assigned by the Government to environmental issues and to the objectives of the Montreal Protocol in particular	1. Strengthened institutional capacity and improved coordination among stakeholders: • Time required for UNEP to disburse the first funding tranche • Timely recruitment of sufficient and qualified National Ozone Unit staff • Timely establishment of adequate infrastructure • Provision of the counterpart funding • Continuity of National Ozone Unit staff and operation • Ratification of Montreal Protocol Amendments • Establishment of the Interagency Committee • Approval of the Action Plan • Access of National Ozone Unit staff to decision makers
2. Legislative measures that promote the phase-out of ODS	3. Development, promotion and adoption of legislative acts and regulations on control of ODS	2. Introduction of legal acts regulating ODS import related issues and their enforcement: • Adoption of legislation on ODS import/export licensing system • Establishment of ODS import quota system • Register of authorized importers • Introduction of ban on trade of ODS and equipment containing ODS • Adoption of qualification requirements for servicing activities • Adoption of legislation that mandates ODS recovery,

[557] As each Country Report is a self-contained chapter with its own Annex, for completeness (but at the expense of repetition) the same Table showing these generalised objectives, outputs and outcomes was provided in each Country Report.

Objectives/Intended Results		Outcomes/Performance indicators
		reclamation and recycling • Measures on enforcement of legislation through training of customs officers • Change of market price between CFCs and substitutes
3. Increased coordination and monitoring of the Country Programme and the Refrigerant Management Plan	4. Effective interaction with governmental institutions and agencies 5. Increased cooperation with business sector and professional associations 6. Assistance in the coordination and monitoring of the implementation of investment and training sub-projects executed by Implementing Agencies as part of the Refrigerant Management Plan	3. Improved coordination and monitoring in implementation of the Country Programme and the Refrigerant Management Plan: • Evidence of access of National Ozone Unit to, and interaction with, decision makers • Involvement of private sector stakeholders • Establishment and support of the Refrigeration Association • Successful completion of training of custom officers together with UNEP • Successful completion of training of good servicing practices • Successful completion of training of ODS recovery, reclamation and recycling operators • Successful completion of conversion of to non-ODS technology
4. The design and implementation of ODS awareness programme	7. Conducting awareness workshops for central and regional governmental officials, environmental inspectors and customs officers on Montreal Protocol objectives 8. TV and radio interviews on ozone layer protection issues 9. Dissemination of booklets about ozone layer protection, and implementation of National ODS Phase out Programme	4. Improved communication with, and effective engagement of governmental and non-governmental institutions, professional organizations, private sector and general public, in ODS phase out activities 5. Reduction of ODS consumption due to public awareness programme • Number of workshops and degree of participation of institutions listed in (4) above • Number of publications prepared and disseminated • Degree of market penetration of ODS-free products and methodologies
5. Support and encourage local industry and technical institutes to adopt ODS-free substitute technologies	10. Support in conversion of manufactured equipment to non-ODS technology 11. Coordination in the provision of modern tools and equipment to servicing workshops in the domestic, commercial refrigeration and air-conditioning sectors	6. Adoption ODS-free substitute technologies 7. Adoption of good servicing practices and availability of modern tools in the refrigeration sector, including recovery and recycling • ODP-tonnes phased out • Number of servicing sets provided to servicing enterprises
6. The collection of required data on ODS use and consumption, establish the lines of communication in the country and reporting to the Ozone	12. Collection, analysis and exchange of Montreal Protocol-related information in the country and the region	8. Establishment the line of communication with the Customs authority and licensed importers as a means of collecting ODS import data

	Outputs/Deliverables	Outcomes/Performance indicators
Secretariat and Implementing Agencies	13. Preparation of annual reports on ODS consumption and National Ozone Unit activities to the Ozone Secretariat 14. Preparation and submission of necessary information and reports to the Implementing Agencies 15. Exchange of experience between the National Ozone Unit and other Network members to combat illegal trade in ODS, including sub-regional cooperation	9. Establishment the line of communication with National Ozone Units in border countries: • Creation of ODS database • Availability of Montreal Protocol-related information on the Ozone-Secretariat website • Reports of the Implementation Committee • Participation in Central Asia and Eastern Europe Networking • Assessments of the quality of the National Ozone Unit reports by Implementing Agencies
7. Country reduction and phase out of the consumption of controlled ODS by the agreed date	16. Coordination of the implementation of the National ODS Phase out Programme	10. Compliance with ODS phase out schedule established by the Parties in a specific Decision, as a result of the considerations of the Protocol's Implementation Committee

8.12.3 Sub-Project finance

3401. GEF provided financial assistance to Uzbekistan in order to assist Uzbekistan to become compliant with the requirements of the Montreal Protocol. The budget was approved on October 1998. The Institutional sub-project was the last of the sub-projects to finish when training concluded in 2007.

3402. The GEF funded four sub-projects in Uzbekistan:

6. GF/4040-00-21 Institutional Strengthening and Capacity Building, including Establishment of the Ozone Office (UNEP)
7. GF/4040-01-15 Training of trainers for use of ODS-free refrigerants, including training of custom officers (UNEP)
8. UZB/98/G31 National programme for recovery and recycling of ODS refrigerants (UNDP/UNOPS)
9. UZB/98/G32 Elimination of the use of CFCs in manufacturing of domestic refrigerators at Sino (UNDP/UNOPS)

3403. The estimated total cost of the project was $ 3,356,194 which included equipment, services, technical assistance, training, physical and price contingencies and net present value of incremental operating costs. The project was financed by a GEF grant of $ 3,203,364 and contributions from the beneficiaries / Government amounting to $ 152,830. The allocation of the project costs is shown in Table 73.

Table 73: GEF-funded projects in Uzbekistan that targeted the reduction and phase out of ozone-depleting substances

Sub-Project/Enterprise	Number	Sector	Aim	Implementing Agency	ODP-tonnes per year	Incremental Investment Costs $	Incremental Operating Costs $	Total Project Costs $	Enterprise or Government Financing $	GEF Financing $
State Committee for Nature Protection	GF/4040-00-21	Technical Assistance	Institutional Strengthening and Capacity Building	UNEP	NA	256,604	NA	256,604	31,000	225,604
Refrigerant Management Plan	GF/4040-01-15	Technical Assistance	Training of trainers for use of ODS-free refrigerants in maintenance and service	UNEP	15.5	134,244	NA	134,244	0.00	134,244
Refrigerant Management Plan	UZB/98/G31	RAC	Refrigerant recovery and recycling – demonstration of equipment	UNDP	91.48	1,327,980	NA	1,327,980	0.00	1,327,980
SINO domestic refrigerator manufacturing facility	UZB/98/G32	RAC	Phase-out of CFCs in the production of domestic refrigerators	UNDP	35.00	1,515,536	121,830	1,637,366	121,830*	1,515,536
TOTAL					141.98	3,234,364	NA	3,356,194	152,830	3,203,364

RAC = Refrigeration and air conditioning; *In-kind

Blank page for double-sided printing

8.12.4 GF/4040-00-21 Uzbekistan, Institutional Strengthening and Capacity Building: Establishment of the Ozone Office (UNEP)

8.12.4.1 Introduction

3404. This project facilitates the establishment of an NOU to undertake and monitor all actions and projects identified in the Country Programme and the Refrigerant Management Plan; to implement a legal and regulatory system that meets the needs of compliance with the Montreal Protocol obligations, and to enhance awareness of ODS and substitutes in all sectors of civil society.

3405. The Ministry of Foreign Economic Relations (MFER) was responsible for developing and concluding contractual agreements in this Project. The State Committee for Nature Protection (SCNP), within the Department of the Atmosphere and Air Protection (DAAP), was responsible for preparing and implementing the sub-projects, as well as monitoring and reporting on their progress. A National Ozone Unit[558] (NOU) was established within SCNP in March 2001, almost 2 years after the sub-projects had started.

3406. The Project aimed to phase out 142 ODP-tonnes of ODS in the refrigeration sector by:

- Establishing a network of refrigerant recovery, recycling ("3R") and reclamation operations that would provide sufficient CFCs to service existing equipment; delivering training course in the best practices of refrigerant management to minimise emissions of CFCs in the stationary air conditioning;
- Eliminating the use of CFCs in the production of domestic refrigerators; and
- Strengthening the government institutional capacity to coordinate and manage the phase out of ODS, including providing training to Customs officers to improve the monitoring and control of ODS.

8.12.4.2 Attainment of objectives and planned results

8.12.4.2.1 Effectiveness

3407. Buxton and Circonkov (2004) in their mid-term evaluation of this sub-project reported that there were no specific achievement or performance indicators in the original Project Document[559]. They suggested that effectiveness could be evaluated against the following outputs which were implied in the Project Document:

- Establishment and effective functioning of an NOU;
- Awareness raising activities completed;
- Alternative ODS technologies adopted by industry;
- Annual reports submitted to the Montreal Protocol on the consumption of ODS; and
- The phase-out of ODS consumption, in compliance with Montreal Protocol decisions.

3408. An assessment of the degree of achievement of these performance indicators by Lithuania is provided in Section 8.8.4.5.1 "*Delivered outputs*" below.

8.12.4.2.2 Relevance

3409. The reduction and phase out of ODS in Uzbekistan is consistent with the objectives of the Vienna Convention and the Montreal Protocol, which *requires Parties to take appropriate measures in accordance with the provisions of this Convention and of those protocols in force to which they are party to protect human health and the environment against adverse effects resulting or likely to result from human activities which modify or are likely to modify the ozone layer*[560].

3410. The GEF established in 1995 an Ozone Layer Depletion Focal Area in response to the Montreal Protocol. The Focal Area has the strategic objective of protecting human health and the

---

[558] Called in Uzbekistan an "Ozone Office", but in this report NOU to allow comparison with other country reports

[559] Buxton, G.V. and R. Ciconkov. 2004. A Mid-Term Evaluation of UNEP's GEF-Sponsored Capacity Development and Institutional Strengthening Projects in Countries with Economies in Transition. Report prepared for UNEP-EO. 174pp. Page 77-78.

[560] Handbook for the Vienna Convention for the Protection of the Ozone Layer - 7th Edition (2006). Article 2: General Obligations.

environment by assisting countries to phase out their consumption and production of ODS, to prevent emissions of ODS, and to encourage the uptake of alternative technologies and practices according to a country's commitments under the Montreal Protocol. The financial interventions in the GEF Focal Area contribute to the return of the ozone layer to pre-1980 ozone levels, which is expected by 2065.

3411. Most recently, the dual capability of ODS to both reduce ozone and significantly impact on the climate have been described[561]. Global ODS consumption in 1989 was equivalent to about 9,200 million tonnes (9 Gt) CO_2-eq/year, which was reduced to about 1,870 million tonnes (1.8 Gt) CO_2-eq/year in 2007 as a result of ODS phase-out activities under the Montreal Protocol. This reduction of about 7 Gt CO_2-eq/year was at least three times greater than the Kyoto Protocol's reduction target (about 1-2 Gt CO_2-eq/year in 2008-2012), demonstrating that the global ODS reductions achieved so far have already yielded a larger climate benefit than the current Kyoto Protocol target.

3412. The actions taken by Uzbekistan to phase out ODS is therefore relevant to further protection of the ozone layer (Montreal Protocol) and relevant to reducing the impact of radiative forcing of the climate (Kyoto Protocol).

8.12.4.2.3 Efficiency

3413. There are currently 5.8 FTEs[562] within the NOU that work on ozone layer protection. The FTE number could increase depending on grants and other projects[563]. The Coordinator was also involved in other duties that were not related to ozone layer protection within Department of the Atmosphere and Air Protection (DAAP). Staff from DAAP also worked part time on ozone-related issues.

3414. The SCNP had inspection staff in regional offices in 14 parts of Uzbekistan, which *inter alia* informed the NOU of the number of ODS licences issued, issued certificates of compliance for enterprises that made products that contained ODS, received payments for ODS taxes, and oversaw the construction of new buildings to ensure ODS-free materials and equipment were being used wherever possible.

3415. In order to monitor the use of ODS by companies, they were required by legislation to submit a form annually to the Regional Inspectorates on the type and quantity of ODS used annually and the amount they had stored. The NOU maintained a database on the quantity and type of ODS installed by these companies. Environmental Inspectors from the SCNP inspected companies, verified the reports received and followed up on cases of non-compliance.

8.12.4.3 Assessment of sustainability of project outcomes

8.12.4.3.1 Financial resources

3416. The NOU was funded from several sources: the State budget, a fee for issuing licences for ODS import/export and export of products containing ODS, and from international sources such as the GEF/UNEP funds for institutional strengthening. There were delays in funding the Institutional Strengthening work of the NOU on two occasions, during which time the staff worked on the programme without salary (see paragraph 3486 for further details).

3417. As the funding for the NOU was obtained from multiple sources, the work on ozone layer protection in Uzbekistan that is being undertaken by this Unit was assessed as sustainable.

8.12.4.3.2 Socio-political

3418. The Government of Uzbekistan fully accepted the *international commitments in the Montreal Protocol* and its amendments. In response, Uzbekistan established an ambitious schedule to reduce and eventually phase-out the consumption of CFCs and other ODS. Uzbekistan faced many challenges to implement its commitments given the importance of CFCs and halons to the industrial sector.

---

[561] Velders, J.M., Andersen, S.O., Daniel, J.S., Fahey, D.W. and M. McFarland. 2007. The Importance of the Montreal Protocol in protecting climate. http://www.pnas.org/content/104/12/4814.abstract

[562] Full Time Equivalents

[563] Expected to increase to 10 FTEs for the upcoming HCFC work. The maximum in the past was 13 FTEs.

3419. Uzbekistan established a *framework for coordination* to facilitate action to reduce and phase out ODS consumption. The Ministry of Foreign Economic Relations (MFER) was responsible for developing and concluding contractual agreements in this Project. The State Committee for Nature Protection (SCNP), within the Department of the Atmosphere and Air Protection (DAAP), was responsible for preparing and implementing the sub-projects, as well as monitoring and reporting on their progress. The National Ozone Unit was established within SCNP as a permanent team whose responsibilities included the initiation, coordination and execution of activities related to ozone layer protection.

3420. Uzbekistan *engaged in partnerships with stakeholders* in the industrial and public sectors to implement its strategy of ozone layer protection through extensive awareness raising and legislative activities. The NOU promoted the use of non-ODS substances and technologies. New suppliers of substances needed to be sourced from new suppliers that were typically not in the Russian Federation. The strategy was largely implemented without the input from NGOs which are absent in Uzbekistan, although there are now efforts underway to establish an association for refrigeration and air-conditioning.

3421. Due to this tripartite approach by Uzbekistan the outcome of projects to reduce and eliminate ODS was assessed as fundamentally sustainable.

8.12.4.3.3 Institutional framework and governance

3422. The Institutional framework and governance in the work undertaken by Uzbekistan was assessed as robust, mainly because of the financial and political support from a key Ministry in the government and an effective implementation path as a result of the ongoing activities of the NOU.

3423. As described above, the Ministry of Foreign Economic Relations was responsible for developing and concluding contractual agreements in this Project. The State Committee for Nature Protection was responsible for preparing and implementing the sub-projects, as well as monitoring and reporting on their progress. The National Ozone Unit was established within SCNP as a permanent team whose responsibilities included the initiation, coordination and execution of activities related to ozone layer protection.

3424. Because of this institutional framework and governance, the outcome of projects to reduce and eliminate ODS was assessed as sustainable.

8.12.4.3.4 Environmental

3425. Uzbekistan's achieved its objective of phasing out of 142 ODP-tonnes as a result of the implementation of these sub-projects. Uzbekistan phased out 35 ODP-tonnes in the domestic refrigerator production facility, and a further 83 ODP-tonnes of CFCs were extracted in the ODS refrigerant recovery, recycling sub-project which allowed CFC-dependent equipment to be serviced.

3426. Moreover, a network of refrigerant recovery, recycling ("3R") and reclamation operations was established that included equipment servicing and training courses on best practices in refrigerant management. The work also strengthened the government's capacity to coordinate and manage the phase out of ODS which resulted in environmental improvements.

3427. Illegal trade in ODS (see paragraph 3451) has the potential to undermine this environmental gain, if it continues to increase. The NOU is seeking funding for additional customs staff to help counter such trade (see paragraph 3452), and for an increase in penalties for illegal imports (see paragraph 3493).

3428. Destruction of ODS as a result of customs seizures of illegal imports, and destruction of unusable ODS as a result of 3R operations, are both necessary to avoid emissions of ODS to the atmosphere and damage to the ozone layer. Work undertaken to date on destruction, and the difficulties of putting in place destruction facilities, are further described in paragraph 3493.

3429. Uzbekistan has an aircraft assembly facility and halon is installed into aircraft for fire protection as part of the operations of this facility (see paragraphs 3494 to 3497). Recovered halon for this facility is imported from the Russian Federation which is only possible as long as there are supplies. Halon is becoming an increasingly scarce resource and supplies may not be available in the future. Halon is also a severe ozone-depleter and should be replaced wherever possible.

The NOU is considering establishing a Halon Management Plan that includes documentation of the uses of halon, and the substitution of halon with alternatives where these are available.

8.12.4.4 Catalytic role

3430. The key factors influencing catalytic action are *innovation, demonstration, replication and cooperation*. Often a single sub-project was a combination of each of these factors. Government policies, measures and action had a significant impact on the speed and extent of catalytic action. The private sector's involvement in projects and co-financing are crucial, as they have a demonstration and replication role as well as an impact on supplier companies supply funded enterprises with raw materials.

3431. The technician training and 3R sub-projects were expected to phase out 75% of the targeted CFCs in Uzbekistan; and the sub-project on domestic refrigerator production 25% of the targeted CFCs. As an example of *catalytic action through cooperation*, the remaining CFC consumption (about 118 ODP-tonnes in 1996) would have been phased out without GEF financial assistance as a result of the introduction of cost-effective alternatives by industry and the implementation of legislative measures by the Government of Uzbekistan. Legislative measures were seen by industry as important for creating a fair competitive environment or 'level playing field'. This encouraged companies to act in concert, and to incur costs and advantages equally, when transitioning to ODS-free substances and technologies.

3432. The SCNP had inspection staff in regional offices in 14 parts of Uzbekistan, which *inter alia* informed the NOU of the number of ODS licences issued, issued certificates of compliance for enterprises that made products that contained ODS, received payments for ODS taxes, and oversaw the construction of new buildings to ensure ODS-free materials and equipment were being used wherever possible. In this way, the relatively small staff of the NOU was able to leverage a much larger network of personnel to extend their operations on ODS significantly. This example of catalytic action was unique to Uzbekistan in this assessment.

3433. Many aspects of the establishment of the ODS recovery, recycling and reclamation (3R) operations in the CEITs were examples of *catalytic action by replication*, particularly the machines required for this operation, and the training on how to use them effectively. The ODS recycling and recovery machines were distributed to a network of refrigeration servicing organisations in Uzbekistan. Some companies that were not allocated the machines purchased their own, in order to undertake ODS recovery operations in the same way as their competitors that received the machines for free.

3434. Training of technicians was a key element of the 3R programmes that was replicated in each CEIT. Some of the CEITs translated the UNEP Manual on the 3R programme into their national language, which facilitated the uniform delivery of the requirements of the programme across the different CEITs. As a further example of *catalytic action by replication*, the sub-project Training Programme for Customs Officers, the first phase trained 17 customs officers and 13 employers of other ministries and committees as trainers. In the second phase, 291 customs officers and 30 SNCP inspectors were trained in 10 courses each of 2-days. The training programme is discussed further in paragraph 3480.

8.12.4.5 Achievement of outputs and activities

8.12.4.5.1 Delivered outputs

3435. They suggested that effectiveness could be evaluated against the following outputs which were implied in the Project Document:

- Establishment and effective functioning of an NOU;
- Establishment of legislative measures to control and phase out ozone-depleting substances;
- Awareness raising activities completed;
- Alternative technologies for ozone-depleting substances adopted by industry;
- Annual reports submitted to the Montreal Protocol on the consumption of ozone-depleting substances; and

- The phase-out of the consumption of ozone-depleting substances, in compliance with Montreal Protocol decisions.

8.12.4.5.1.1 Establishment of an NOU

3436. The Ministry of Foreign Economic Relations was responsible for developing and concluding contractual agreements in this Project. The State Committee for Nature Protection, within the Department of the Atmosphere and Air Protection, was responsible for preparing and implementing the sub-projects, as well as monitoring and reporting on their progress. A National Ozone Unit[564] (NOU) was established within State Committee for Nature Protection in March 2001, almost 2 years after the sub-projects had started.

3437. The NOU is responsible for undertaking and monitoring all actions and projects identified in the Country Programme and the Refrigerant Management Plan; to implement a legal and regulatory system that meets the needs of compliance with the Montreal Protocol obligations; and to enhance awareness of ODS and substitutes in all sectors of civil society.

3438. Uzbekistan was assessed as having achieved this performance indicator that required the establishment of an NOU.

8.12.4.5.1.2 Legislative measures

3439. The NOU drafted and implemented a range of legislative measures on ozone layer protection, which are summarised in Table 74. This legislation on ODS included:

- An import/export licensing system;
- A ban on the import of halons (except for essential uses) and fully halogenated CFCs;
- The introduction of import quotas for CFCs, carbon tetrachloride and methyl chloroform;
- A ban on the import of refrigeration and air conditioning equipment containing CFCs;
- Legislation that targeted customs control of ODS;
- A tax on ODS because of its polluting properties and the need for waste disposal, which defined payments for ODS import and products containing ODS;
- Obligatory certification of some goods including domestic and commercial refrigerators, air conditioners and heat pumps to improve the operations of Customs;
- Amendments to previous legislation that improved the implementation of existing regulations applicable to the import/export of new, used, recycled ODS and ODS-containing products;
- Qualification requirements;
- Import quotas for HCFCs from 2005 to 2030;
- Mandatory importer reports to SCNP on the quantity of ODS imported; and
- Better definition of procedures for issuing permits for the import/export of ODS within the established quotas, and the export of products containing ODS.

Table 74: Legislation adopted in Uzbekistan on ozone-depleting substances

Date	Number	Description
27 December 1996	The Law	"About protection of atmosphere air" of the Republic of Uzbekistan
24 January 2000	Decision No 20	"About measure on international obligations Implementation of the Republic of Uzbekistan on agreements of Protection of the Ozone Layer"
14 March 2000	Decision No 90	"On Regulation of import and export of ODS and

[564] Called in Uzbekistan an "Ozone Office", but in this report NOU to allow comparison with other country reports

Date	Number	Description
		products containing them“
1 May 2003	Resolution No 199	“On the improvement of the system of payments for Pollution of the Natural Environment and Waste Disposal on the territory of Uzbekistan"
6 July 2004	Resolution No 318	On further actions for simplification of the products certification procedure
11 November 2005	Decision No 247	“On the improvement of regulation of the import into the Republic of Uzbekistan and the Republic of Uzbekistan from the export of ODS and products containing them”
18 January 2006	The order State Committee for Nature Protection No 4	About the organization of work in the State Committee for Nature Protection of Republic of Uzbekistan on the implementation of Resolutions of the Cabinet of Ministers of the Republic of Uzbekistan dated 11 November 2005 № 247

3440. A programme aimed to recover, recycle and reclaim as much refrigerant as possible was established during the transition period between CFCs and CFC-free technology, at a time when imports of CFCs were banned. The results of this programme are reported in Section 8.12.6 on page 666 entitled “National programme for the recovery and recycling of ODS”.

3441. Uzbekistan was assessed as having achieved this performance indicator that required legislation that restricted and ultimately phased out the use of ozone-depleting substances to be drafted and implemented.

8.12.4.5.1.3 Awareness raising activities

3442. During the three-year period from March 2001 until December 2003, a range of activities were carried out by the NOU to build and maintain public support for legislation and policies on ozone layer protection. There were formal meetings 3-4 times per year with regional offices to discuss NOU issues and specific topics e.g., licensing. The public was informed of the danger of high UV for health and environment when ODS is used, and the actions that are needed to replace ODS with substitutes.

3443. The NOU: Published 25 articles in the mass media; Participated in 15 radio and 18 TV shows; Delivered 41 lectures attended by 1,055 people of different age; Printed and distributed almost 14,000 calendars in multiple languages; Published and distributed 4,400 books for children “Our ozone umbrella”; Designed and printed a postage stamp; Staged an ecological play for children “Rustik – the alien”; Carried out at the beginning of June annual ecological festival “Chimgan-Eco”, which attracted 1100 participants; Arranged on a discussion on the International day of the ozone layer protection; and Distributed 6 bulletins and printed a special publication “Let’s save the ozone layer”.

3444. As in many other countries, Uzbekistan had undertaken extensive activities on Awareness Raising to shore up support from the public, government and business stakeholders for legislation and activities that would restrict and eventually phase out ODS. The public was continuously informed of the possible negative effects for human health and the environment. There was a special focus on making children more aware of the ozone layer problem: 4000 books called “Our Ozone Umbrella” were published in three languages and distributed; a screenplay called “Rustik – the Alien” was written and staged. Various PR materials related to the ozone layer protection, such as calendars, posters, and postage stamps, were produced and distributed. The State TV and Radio Committee broadcast the “Ozzy Ozone” in the Uzbek and Russian languages. The brochure "Ozone layer" was published and circulated in the Uzbek and Russian languages in 2007. In total, 78 articles were published and there were 75 radio and television broadcasts.

3445. Uzbekistan was assessed as having achieved this performance indicator that required a programme of awareness raising activities to be designed and delivered.

8.12.4.5.1.4 Alternative technologies adopted by industry

3446. The major project in Uzbekistan was the adoption of elimination of CFCs at the SINO refrigerator production facility, which is assessed on page 678 in Section 8.12.7: *UZB/98/G32 Elimination of the use of CFCs in manufacturing of domestic refrigerators at Sino (UNDP/UNOPS)*.

8.12.4.5.1.5 Annual reports submitted to the Montreal Protocol

3447. The NOU coordinator prepared and submitted reports to the Montreal Protocol each year from 1993 to 2007, which was the last year of the evaluation for this assessment. Uzbekistan was assessed as having achieved this performance indicator.

8.12.4.5.1.6 The phase-out of the consumption of ozone-depleting substances in compliance with Montreal Protocol decisions

3448. Uzbekistan's objective to phase out of 142 ODP-tonnes as a result of the Project was achieved. Uzbekistan reported zero ODS consumption for CFCs, carbon tetrachloride and methyl chloroform from 1 January 2002. For the CFC component, Uzbekistan phased out 35 ODP-tonnes in the domestic refrigerator production facility, and a further 83 ODP-tonnes of CFCs were extracted in the ODS refrigerant recovery, recycling sub-project. The remaining 24 ODP-tonnes could have been replaced by reductions in imports of CFCs as a result of legislation in place than banned their imports, coupled with reduced demand for the use of CFCs in refrigeration and air-conditioning equipment that had been converted to ODS-free alternatives.

3449. Uzbekistan also complied with Decision X/28 of the Parties to the Montreal Protocol which, based on the 1996 reported consumption of 260.3 ODP-tonnes, required CFCs to be reduced by 40% by 2000 (Target 165 ODP-tonnes / Achieved 41.7 ODP-tonnes), 80% by 2001 (55 / 15.3) and 100% reduction by 2002 (0/0). Targets were also established in Decision X/28 for carbon tetrachloride and methyl chloroform and in each case Uzbekistan met the targets and phased out by the date required in the Decision.

3450. The GEF finance in Uzbekistan achieved the objectives of a network of refrigerant recovery, recycling ("3R") and reclamation operations that provided sufficient CFCs to service existing equipment; training courses that delivered the best practices of refrigerant management to minimise emissions of CFCs in the stationary air conditioning; the elimination of the use of CFCs in the production of domestic refrigerators; and the strengthening of the government institutional capacity to coordinate and manage the phase out of ODS, including provision of training to Customs officers to improve the monitoring and control of ODS.

8.12.4.5.2 Illegal trade interceptions

3451. On 1 May 2002, the State Customs Committee (SCC) and the State Committee for Nature Protection (SCNP) identified the illegal import of CFC-12 refrigerators from the Russian Federation, resulting in 596 units being returned 3 months later. Since 2004 there have been 30 formally registered cases of illegal importation of ODS and products containing ODS into Uzbekistan, 5 of which were in 2006 and 17 in the first half-year 2007. There were 11 cases of illegal CFC imports from 2000-2005. There were 13 instances of illegal imports in 2007, consisting of CFCs, HCFCs, and blends. The CFCs were held pending destruction, and the HCFCs were allowed to be placed on the market. In 2007, there were 5 separate illegal imports intercepted from China of deep-freeze cabinets (more than 7,200 units) containing CFC-12.

3452. There is now joint SCC/SCNP control of goods, checks of chemicals imported and confiscations of contraband. In 2008, the NOU formally requested an increase in SCC staff that are needed to share the responsibility with SCNP for reviewing and issuing ODS import/export license applications, for entering the data into a consolidated database, and for collecting the fees from license applicants. Regulations are also needed to define how the fees collected could contribute toward the costs of additional SCC staff.

8.12.4.5.3 Awareness about ODS, ODS substitute technology, and strengthening of institutional capacities for dealing with ODS phase-out

3453. The extensive work in Uzbekistan to increase the awareness of ozone layer depletion was described in Section 8.12.4.5.1.3 above. The work on ODS substitute technology was focused on one enterprise (SINO) and described on page 678 in Section 8.12.7 *UZB/98/G32 Elimination of the use of CFCs in manufacturing of domestic refrigerators at Sino (UNDP/UNOPS)*.

3454. Uzbekistan established a *framework for coordination* to facilitate action to reduce and phase out ODS consumption. The Ministry of Foreign Economic Relations was responsible for developing and concluding contractual agreements in this Project. The State Committee for Nature Protection, within the Department of the Atmosphere and Air Protection, was responsible for preparing and implementing the sub-projects, as well as monitoring and reporting on their progress. The National Ozone Unit was established within SCNP as a permanent team whose responsibilities included the initiation, coordination and execution of activities related to ozone layer protection.

3455. Uzbekistan *engaged in partnerships with stakeholders* in the industrial and public sectors to implement its strategy of ozone layer protection through extensive awareness raising and legislative activities. The NOU promoted the use of non-ODS substances and technologies. New suppliers of substances needed to be sourced from new suppliers that were typically not in the Russian Federation. The strategy was largely implemented without the input from NGOs which are absent in Uzbekistan, although there are now efforts underway to establish an association for refrigeration and air-conditioning.

3456. Using this approach, Uzbekistan strengthened its institutional capacities for dealing with ODS phase-out and moreover, this institutional capacity was assessed as sustainable.

8.12.4.5.4 Authority / credibility, necessary to influence policy and decision-makers

3457. The NOU engages with ministries and departments such the State Customs Committee, the Ministry of Foreign Economic Relations, the Ministry of Justice, the Ministry of Finance, the State Tax Committee, the Ministry of Economy, the Ministry of Foreign Affairs, and the Ministry of Internal Affairs.

3458. The Uzbekistan NOU has the authority / credibility, necessary to influence policy and decision-makers, which has been shown mainly through the NOUs ability:

- To draft and implement extensive and important legislation that reduces and eliminates ODS (see Table 74, for example);
- To establish an effective 3R programme in collaboration with industry that recovers and recycles ODS for servicing of equipment as well as trains technicians in best practice;
- To encourage the industry to eliminate ODS in the production of domestic refrigerators; and
- To establish international workshops on ODS such as the one convened in Tashkent in September 2009, which required the approval of the Deputy prime minister and the Foreign Affairs department

3459. This credibility has been established by an NOU team that is well-qualified to carry out tasks on ODS reduction and phase out due to a combination of political, technical and administrative expertise.

8.12.4.6 Assessment of Monitoring and Evaluation Systems

8.12.4.6.1 Monitoring and evaluation design

3460. This project was designed to raise awareness of the phenomenon of ozone depletion; to encourage the use of ODS substitute technology; to strengthen institutional infrastructure to deal with ODS phase-out; to implement procedures to meet and exceed the Montreal Protocol phase-out schedule; and to enable the Government of Uzbekistan to phase out all consumption of ODS by 2002.

3461. There were no performance indicators, and therefore UNEP did not implement best practice

monitoring and evaluation standards and project management practices. The NOU overcame this limitation with objectives and targets. Risk analysis by UNEP was not part of the project design. The key Performance Indicators, as planned outputs / deliverables described in the project documents, were to:

- Establish the NOU;
- Facilitate the development and adoption of legislative measures for the phase-out of ODS;
- Design and implement an ODS awareness programme;
- Collect data on ODS use and consumption, and report these data to the Ozone Secretariat;
- Coordinate and monitor the implementation of an action plan to phase-out ODs

3462. Although there were no Performance Indicators noted in the project documentation[565], the NOU developed some de facto PIs according to the nature of the supported activity. These were*:*

- Evidence of enhanced capacity and actions that create a suitable climate in the country for the expeditious phase-out if ODS;
- Evidence that alternative technologies have been adopted;
- The timely phase-out of ODS consumption;
- Evidence of increased coordination, promotion and monitoring of in-country activities for phasing out ODS;
- Evidence of improved collection, analysis and dissemination of information with other countries; and
- Evidence of improvements in reporting systems on national data on ODS consumption.

3463. For these reasons, the assessors that completed the UNEP "Mid-Term Evaluation" and now this "Terminal Evaluation" have used implied Performance Indicators when making these assessments.

8.12.4.6.2 Monitoring and evaluation plan implementation

3464. Some risk analysis was undertaken by UNEP but this was not always fully completed with follow up areas where implementation was regarded to be at risk. UNEP in 2005 characterised Uzbekistan's management of the Project as low risk in all aspects: management structure, work flow, implementation, budget, fund management, reporting, stakeholder involvement, communication, leadership, short term / long term balance (for sustainability and replication), science and technological issues (follows TEAP closely), and political influence (full political support and engagement).

3465. There was no evidence of adaptive risk management by UNEP. The NOU did not mention training in Monitoring and Evaluation activities when interviewed and therefore the assessment team assumes that this did not take place.

3466. UNEP monitored the phase out of ODS (relative to the starting baseline) as reported by Uzbekistan to the Ozone Secretariat, and this became the *de facto* Performance Indicator of the measure of progress by Uzbekistan in the phase out and reduction of ODS. In addition UNEP reviewed the quarterly and semi annual reports submitted by Uzbekistan.

3467. At the national level, and in the absence of strong leadership by UNEP, the NOU coordinator or sometimes the chair of SCNP met on a regular basis with other departments and the private sector to monitor and evaluate work on ozone-layer protection in Uzbekistan. The meetings reviewed progress on projects, discussed reports, and highlighted problems and suggested solutions. The NOU coordinator informed participants of key outcomes of national and international meetings.

3468. The NOU coordinator prepared and submitted reports to UNEP quarterly, half-yearly or annually

[565] Buxton, G.V. and R. Ciconkov. 2004. A Mid-Term Evaluation of UNEP's GEF-Sponsored Capacity Development and Institutional Strengthening Projects in Countries with Economies in Transition. Report prepared for UNEP-EO. 174pp. Page 146.

depending on the reporting requirement. The Coordinator is well-organised with clearly labelled dossiers and well-indexed information that could be easily accessed, which facilitated monitoring and reporting in an efficient, comprehensive and timely manner.

3469. The NOU also carried out activities that were additional to its mandate. For example, when it became necessary to achieve progress in the phase out of ODS at the SINO domestic refrigerator production facility, the NOU visited SINO 18 times. In this respect, the NOU effectively undertook the work of UNOPS in supervising and assisting with the implementation of the investment sub-project.

8.12.4.6.3 Budgeting and funding for monitoring and evaluation activities

3470. The evaluation team focused on the outcomes of the projects rather than the detail of the financial expenditure. In general, the NOU coordinator prepared the financial plan in coordination with the NOU accountant, which was then approved by the chairman of the SCNP. Quarterly financial reports were submitted to UNEP, sometimes with a delay due to translation from Russian to English. UNEP commented that Uzbekistan's reports contained critical analysis and were very thorough.

3471. Financial auditing (including NOU expenditures) is carried out by an independent auditor along with the SCNP expenditures in the first quarter of each year. Such a review was being undertaken during our visit in February 2009. The financial planning and management aspects are adequate, timely and efficient.

8.12.4.6.4 Long-term monitoring

3472. Article 7 "Reporting of data" mandates Parties to the Montreal Protocol to report by 30 September each year on their consumption and production of ODS in the previous year. Decision XV/15 in 2003 encouraged Parties to forward data on consumption and production to the Secretariat as soon as the figures became available, and preferably by 30 June each year, rather than 30 September in order to facilitate the work of the Implementation Committee. The Secretariat reported recently that most Parties are able to comply with the June requirement.

3473. Data reporting on consumption is the most important action on long-term monitoring and a 'litmus test' of progress in the phase out of ODS and the sustainability of the phase out. The Implementation Committee has not remarked on any aspects of data reporting by Uzbekistan, which suggest that reporting has been timely and accurate. Data reporting, and the infrastructure necessary for this, is expected to continue to be included in the annual budget by the government of Uzbekistan for the NOU/SCNP.

8.12.4.7 Assessment of processes that affected attainment of project results

8.12.4.7.1 Preparation and readiness

3474. The overall project commenced in 1999 following the approval of the budget by the GEF in October 1998. Uzbekistan showed a reasonable level of preparation and readiness as in 1999 two important legislative measures were under government consideration – the first on international obligations under the Montreal Protocol (Decision 20, adopted 24 January 2000) and the second a regulation to licence the import and export of ODS (Decision 90, adopted 14 March 2000). The passage of enabling legislation was fundamental to the control of ODS in Uzbekistan and they provided a solid foundation on which to launch sub-projects to improve ozone layer protection. A basic description of the legislation was provided in paragraph 3435 and Table 74.

3475. Legislation implemented in 2005 provided quotas to restrict the import of HCFCs, which are now recognised as too restrictive given the 48% increase in 2007 (compared to 2006) for permits for refrigeration and air-conditioning equipment that depends on HCFCs. To overcome this problem, the NOU planned to import and stockpile about 350 tonnes of HCFCs[566]. Uzbekistan would remain compliant with the requirements of the Montreal Protocol if this amount of HCFCs were to be imported prior to 1 January 2015, but its 2005 legislation would need to be amended to permit these additional imports. Uzbekistan's legislation would also need to be amended to

566 Uzbekistan was reported to have stockpiled CFCs in the early 1990s for ongoing servicing needs in the late 1990s.

take into account the changes to the control schedule affecting HCFCs that were agreed by the Parties to the Montreal Protocol in 2007.

8.12.4.7.2 Country commitment and motivation

3476. At least 200 Customs officers have been trained in all aspects of ODS detection. The SCC has been issued with 15 refrigerant identifiers. Together with the SCNP, the SCC has successfully intercepted refrigerant and equipment that is not permitted in Uzbekistan. However, the number of interceptions has risen in recent years, suggesting that illegal imports are continuing to find their way onto the market.

3477. The black market price of CFCs in 2009 was about $5/kg, which was less than the price of HCFC-22. This would suggest that CFCs are still prevalent on the market in Uzbekistan, despite the concerted efforts of the SCC/SCNP to control its entry.

3478. Both SCC and SCNP planned to put into effect more dissuasive penalties for those caught contravening ODS legislation, to implement legislation that supported the SCC on illegal trade in ODS, and to implement a number of regional activities that combated illegal trade. In order to avoid an increase in CFCs being illegally imported, the government had given these actions a high priority, so that illegal trade did not undermine the achievements in the programme so far.

3479. The government is fully committed to eliminating the use of all ODS, including HCFCs. It appeared that HCFCs imports may increase in the near future to cope with service demand that was larger than originally anticipated. The NOU planned to change the legislation to allow for an increase in the import quotas for HCFCs. However, the NOU also planned to investigate the potential for an accelerated retrofit programme that would convert HCFC-based equipment to ODS-free operations, thereby reducing the demand for HCFCs in the near and longer terms.

8.12.4.7.3 Stakeholder involvement

3480. The NOU established a range of activities with the SCNP and State Customs Committee (SCC) to combat illegal trade. Details of the training programme and other activities that were carried out with the Customs Authority are provided in paragraphs 3509 to 3514 below.

3481. In the course of the training programme, some other stakeholders were involved: the State Committee for Printing, the Ministry of Higher and Secondary Technical Education, higher-educational institutions, NGOs and enterprises. Enterprises that undertake activities with ODS and ODS-containing equipment are required by law to keep records of ODS usage and must switch to ozone-safe technologies. The NGOs are invited and attend many meetings and workshops. UNDP specialists located in Tashkent are also consulted as the implementing agency responsible for the equipment provided for the 3R project (see Section 8.12.6: UZB/98/G31 National programme for recovery and recycling of ODS refrigerants (UNDP/UNOPS)).

3482. A programme aimed to recover, recycle and reclaim as much refrigerant as possible was established with other stakeholders during the transition period between CFCs and CFC-free technology, at a time when imports of CFCs were banned. The results of this programme were reported in Section 8.12.5 on page 657 entitled "*GF/4040-01-15 Training of trainers for use of ODS-free refrigerants, including training of custom officers (UNEP)*".

8.12.4.7.4 Financial planning

3483. In general, the NOU coordinator prepares the financial plan in coordination with the NOU accountant, which is then approved by the chairman of the SCNP. Quarterly financial reports have been submitted to UNEP by the NOU from Uzbekistan. The assessment team was not provided access to the financial planning documents.

3484. The activities of the NOU for this sub-project were co-financed from the central government budget, and from a fee that is charged for issuing licences for ODS imports. As the fee for imports applies only to HCFCs, it can be expected that the fees will increase shortly due to the increase in imports of HCFCs to meet equipment servicing requirements, but after about 2015 the fees are likely to reduce as imports reduce. It is not clear whether the government will increase its share at that time, of if another licence fee (for HFCs for example) would be implemented to take up the shortfall.

8.12.4.7.5 UNEP supervision and support

3485. UNEP was the lead agency in the Country Programme preparation and in the implementation of Institutional Strengthening and Capacity Building, awareness raising and training activities. UNEP DTIE (Paris) was the responsible supervising organisation from the inception of the NOU in Uzbekistan in 2001 until 2003. This period was the period of initiation and learning for the newly formed NOU. UNEP GEF (Nairobi) took over the supervisory role from 2004 onwards.

3486. Funding payments by UNEP-DTIE were not forthcoming from November 2003 onwards for a period of 18 months, which resulted in staff being unsalaried for this period (see paragraphs 3489 to 3492 for further information). UNEP GEF was not able to resolve this problem in a timely manner, possibly due to the administrative changes that occurred in the changeover from UNEP DTIE to UNEP GEF. Some of the staff were partly compensated by SCNP for part of this period, but others went unpaid. Despite the lack of salary, the staff (to their credit) continued to work on the sub-projects.

8.12.4.7.6 Co-financing and project outcomes & sustainability

3487. The Government declared co-financing of $31,000. Some of this finance was in-kind such as time allocated by staff to the project. However, some of this amount was for equipment upgrades (the photocopier), new computers (from licence permits) and office furniture.

3488. Reporting of in-kind co-financing was not a part of the original project reporting. There have been no official lists of leveraged resources for the projects of the Ozone portfolio, as this was never mandatory for Ozone projects. However, with the extension of projects, and expansion of some of the originally designed activities, the Government has undoubtedly allocated financial resources in support of ozone layer protection. This funding has been important for sustaining the outcome of the sub-projects. Sustainability of the process of ODS elimination depends mainly on the institutional capacity to enforce the existing legislation and end-user and consumer awareness. The delay in provision of funds by UNEP DGEF to the NOU put at risk the outcomes of the IS project achieved.

8.12.4.7.7 Project implementation delays and impact on project outcomes & sustainability

8.12.4.7.7.1 Delays and project outcomes

3489. The funding for the operations of the NOU was delayed at the beginning of the Project, and ongoing issues related to funding for institutional strengthening, that have caused severe difficulties that have been difficult to resolve.

3490. At the beginning of the Project, the NOU reported that there was not a clear understanding of the source of the operational funds in the discussions with UNDP/UNEP. UNDP considered that the national co-finance provided the operational finance for the sub-project. However, GEF allocated finance to the IAs for operational costs for both investment and non-investment activities. The NOU wanted the source of the operational funds to have been clarified at the beginning of the Project.

3491. There was a funding delay of 17 months from when the project was signed in November 2000 until payment in April 2001, which resulted in staff in the NOU working for this period with 15% of their salaries paid by the SNCP. The NOU contacted UNDP several times, as all transfers even from UNEP came to the NOU from UNDP, to try to establish the cause of the delay. The problem was only resolved when procedures for the transfer of funds had been agreed between UNDP and the Ministry of Finance. At that stage when the contracts were just beginning, the NOU did not know whether the delay should be considered normal operations for UNDP/UNEP, or whether they had a genuine reason for concern.

3492. It appeared that the funding issues have still not been fully resolved. A prolongation of the funds for Institutional Strengthening was approved by the GEF in 2008, but as at May 2009 these have still not been received by the NOU.

8.12.4.7.7.2 Lack of facilities to destroy ODS and its impact on the sustainability of the phase out of ODS

3493. The illegal CFCs (328 kg) from some of the interceptions were subsequently destroyed in at a

small-scale facility using procedures that were costly[567] and impractical. There is a further 505 kg in two lots awaiting destruction from seizures in 2006 and 2007. In Uzbekistan and probably many other countries, key elements of the destruction process were missing such as an automated process for destruction, a national standard to ensure no emissions of hazardous waste, a specialised facility for destruction, and trained personnel to carry out this work. There was a limited capability to analyze emissions. The NOU opined that the penalties for import needed to be more of a deterrent (currently $15) and the importer should be bear the costs of re-exporting all equipment that was illegally imported.

8.12.4.7.7.3 Halon

3494. Uzbekistan banned the import of halons except those intended for Essential Uses from 1 January 2000. Omitting plans to manage halon decommissioning and bank formation appeared to be an oversight in Uzbekistan's Country Plan, particularly as the country required the use of halon for about 22 aircraft. As halon replacements are governed by the ICAO Council approval, and that such approvals are likely to be slow coming forward, it would seem prudent for Uzbekistan to develop a Halon Management Plan as soon as possible. The Plan should include decommissioning halon uses where alternatives are available, and storing the decommissioned halon for uses of halon that do not have an alternative, such as those uses in aircraft described by Uzbekistan. Recovery and banking equipment would be essential in order to stock as much decommissioned halon as possible.

3495. SJSC Tapoich (TAPC) supplies halon 1211, 1301, 2402 and CFC-13 fire extinguishing equipment for use on 3 types[568] of aircraft that are used for fire and explosion suppression. The ODS fire extinguishers are used in different parts of the aircraft such as the engine nacelles, wings, cargo hold and crew-passenger compartments. The last of the halon stocks held by TAPC were depleted in 1996.

3496. Halons were used as fire-extinguishing agents in commercial transport aircraft for 45 years. Minimum Performance Standards for each application of halon have been developed by the International Aircraft Systems Fire Protection Working Group, in cooperation with the aircraft industry and regulatory authorities. Any potential replacement for halon must meet stringent aircraft-specific requirements currently applied to each application of halon. In the light of dwindling halon supplies, the ICAO Council in 2007 said that it may consider coming forward in 2014 with timeframe for the replacement of halon in hand-held extinguishers for new production aircraft. There was no comment on the replacement of halon in the engine nacelles, wings and cargo hold.

3497. The NOU only discovered the need for halon after 2002 when the aircraft assembly plant requested a licence to import halon. Uzbekistan applied to the Montreal Protocol in 2002 for Essential Use exemptions to allow the import and use of halon 1211, 1301, 2402 and CFC-13 in 2002, 2003 and 2004. A total of about 1.9 tonnes was requested in each year. The Parties to the Montreal Protocol did not approve Uzbekistan's request[569], but instead recommended that the halon be imported from the Russian Science Federation (in St. Petersburg). The halon has been imported and the quantities stored at each location are known to the NOU. Although imports of recycled halon will not increase the ODS consumption of Uzbekistan, the continued import over a prolonged period cannot be assured if there are difficulties obtaining and storing halon at source. Uzbekistan was not required to report any imported-recycled halon as consumption, which remained at zero[570].

8.12.4.7.7.4 Methyl bromide

3498. The action by Uzbekistan to reduce and phase out the use of methyl bromide is reported

---

567 $5000. The importer paid a $15 fine for the illegal imports. The NOU is seeking to have the penalty adjusted so that it is more dissuasive.

568 12 x IL-76: Multi-purpose heavy transport aircraft with a payload capacity of 60 tons; 10 x IL-114: Regional 52-64 seat passenger aircraft; and 6 x IL-78: Aerial refuelling tanker. Export News. 2005.

569 The last approval for Essential Uses by the Parties for halon was 90t for use in the Russian Federation in 2000.

570 "Production" means the amount of controlled substances produced, minus the amount destroyed by technologies to be approved by the Parties and minus the amount entirely used as feedstock in the manufacture of other chemicals. The amount recycled and reused is not to be considered as "production". MP Art 1(5): Definitions; and Decisions IV/24 and VI/9.

separately[571].

8.12.4.8 Sub-Project Rating

GF/4040-00-21 – Uzbekistan, Institutional Strengthening and Capacity Building: Establishment of the Ozone Office (UNEP)		
Criterion	**Evaluator's Summary Comments**	**Evaluator's Rating**
Attainment of project objectives and results Sub criteria (in yellow below)	See comments below	HS
Effectiveness	All the project objectives were achieved	HS
Relevance	Government actions were consistent with the goals of the Montreal Protocol	HS
Efficiency	A relatively small team in the NOU leveraged national resources to coordinate the reduction and phase out of ODS in a timely manner	HS
Sustainability of Project outcomes (overall rating) Sub criteria (in yellow below)	See comments below	HS
Financial	Discontinuous funding for NOU	S
Socio-Political	Acceptance of international commitments; good framework for coordination to facilitate action; strong engagement with stakeholders	HS
Institutional framework and governance	Robust support from important government institutions and good governance which facilitated legislative advances	HS
Environmental	Achieved the project goals, but sustainability could be undermined to some extent by illegal trade, lack of facilities for destruction, and lack of management plan to promote alternatives for imported halon	S
Achievement of outputs and activities	Outputs delivered to a high standard	HS
Monitoring and Evaluation (overall rating) Sub criteria (in yellow below)	See comments below	S
M&E Design	SMART indicators were not used, and therefore UNEP did not implement best practice monitoring and evaluation standards and project management practices; Uzbekistan NOU overcame this	MS

571 Batchelor, T.A. and V. Smirnov. 2010. Total sector methyl bromide phase out in CEITs. Report submitted under contract to UNEP-EO, Nairobi.

GF/4040-00-21 – Uzbekistan, Institutional Strengthening and Capacity Building: Establishment of the Ozone Office (UNEP)		
Criterion	**Evaluator's Summary Comments**	**Evaluator's Rating**
	limitation with objectives and targets.	
M&E Plan Implementation (use for adaptive management)	Partial risk analysis by UNEP, but little evidence of adaptive management by UNEP. No training by UNEP in M&E activities.	S
Budgeting and Funding for M&E activities	M&E activities were included in the overall budget allocated to the NOU	S
Catalytic Role	No rating requested	NR
Preparation and readiness	Adoption of enabling legislation was fundamental to the control of ODS in Uzbekistan and readied the country for projects on ODS reduction and phase out	HS
Country commitment and motivation*	Uzbekistan showed strong commitment to the sustainable protection of the ozone layer through the establishment and funding of a well-managed and expertly-staffed NOU	HS
Stakeholders' involvement	The NOU coordinated a multi-stakeholder action with relevant ministries, the public and industry sectors, as well as with international organisations and other neighboring countries	HS
Financial planning	Comprehensive and thorough quarterly reports were submitted to UNEP which showed good financial control. Some aspects of the NOUs operations generated funding for NOU equipment.	HS
UNEP supervision and support**	Discontinuity of funding by UNEP put a risk the IS project. This risk was eliminated by continued work by the NOU despite the lack of funding for a prolonged period	MS
Overall Rating		HS

Highly Satisfactory (HS); Satisfactory (S); Moderately Satisfactory (MS); Moderately Unsatisfactory (MU); Unsatisfactory (U); Highly Unsatisfactory (HU);
*Motivation replaced TOR '*driveness*'; **Support replaced TOR 'backshopping'

8.12.5 GF/4040-01-15 Training of trainers for use of ODS-free refrigerants, including training of custom officers (UNEP)

8.12.5.1 Introduction

3499. This programme that was agreed between UNEP and the government of Uzbekistan aimed to recover, recycle and reclaim as much refrigerant as possible during the transition period between CFCs and CFC-free technology, at a time when imports of CFCs to Uzbekistan were banned. Therefore, the only available CFC refrigerant to service existing equipment was obtained from the CFCs in the market that were recovered, recycled and reclaimed.

3500. The first part of the programme is discussed in this section (Training of technicians in refrigeration management) while the second part of the programme (Recovery and recycling equipment) is discussed in the next sub-project and section.

3501. The specific aims of the project were to:

- Raise the awareness of environmental damage caused by ODS and the ongoing use of ODS for servicing with technicians that serviced refrigerators and air-conditioning equipment;
- Improve the skills of servicing technicians to best practice standards;
- Development best practice guides as a resource for technicians;
- Mainstream the training programmes into existing teaching facilities in order to promote sustainability of the programmes after the sub-project was completed;
- Train Custom Officials to detect illegal imports/exports of ODS and ODS-containing equipment;
- To reduce uncontrolled emissions of ODS to a minimum and conserve ODS for servicing of ODS-dependent equipment.

3502. The performance indicators[565] taken from the Project document were:

- 25 refrigeration technicians trained in the Train-the-Trainers programme in Phase I by June 2001;
- 380 refrigeration technicians trained in Phase II by July 2002;
- 25 custom officers trained in Phase I by January 2002;
- 200 custom officers trained in Phase II by December 2003;
- Inclusion of the training module in the training institution by July 2002.

3503. Buxton and Ciconkov (2004) remarked that a Memorandum of Understanding between UNEP and the NOU contained Performance Indicators that were more ambitious than those shown above. This issue was not raised in this Terminal Evaluation.

8.12.5.2 Attainment of objectives and planned results

8.12.5.2.1 Effectiveness

8.12.5.2.1.1 Refrigeration technician training

3504. The training programme began with the Train-the-Trainers programme. Twenty-six trainers were trained in April 2001. Of the 26 trained, 6 became trainers for the remainder of the Project. The Performance Indicator of 25 technicians trained by 1 June 2001 was therefore met and exceeded.

3505. The equipment used in the training facilities was outdated but probably adequate for teaching the principles of refrigeration and air conditioning (Figure 47). As a form of quality control in the

Figure 47: Training room (top), demonstration air conditioning chiller (middle) and gas chromatograph (bottom). Tashkent State Technical University, Uzbekistan.

teaching method and content, the first course delivered by the trainer was supervised by an experienced trainer, who provided suggestions for improvement. This uniformity of training was not addressed in other countries, and this was assessed by the evaluation team as a useful element.

3506. There were 1,500 applicants for the training courses. Those that already some skills and worked in servicing centres with a significant volume of operations were given priority for training. In the period from the first training course on 23 April 2001 to the last in the sub-project on 3 December 2007[572], 853 personnel were trained by 9 trainers in 35 courses, each 5 days and held at 13 locations. This included 127 specialists from the Syrdarya refrigerating depot that were trained by specialists at the depot. The Performance Indicator of 380 technicians trained by July 2002 was therefore met and vastly exceeded.

3507. The training was satisfactorily completed and was useful in supporting phase-out. This was a view shared also by the refrigeration service enterprises. The training courses were reported by enterprises to have given practical guidance to technicians, which was evident to the employers when the technicians returned to work and were able to competently carry out repair and maintenance work.

3508. Based on the NOU estimate of total number of personnel that work on refrigeration and air-conditioning equipment, about 75% had received training in courses delivered during the project. However, there were no technicians trained after 2007 when the project finished.

8.12.5.2.1.2 Customs officer training

3509. The NOU established a range of activities with the SCNP and State Customs Committee (SCC) to combat illegal trade. The sub-project Training Programme for Customs Officers started on December 2001 and concluded in October 2007.

3510. In the first phase which took place in August 2002, 17 customs officers and 13 employers of other ministries and committees were trained as trainers. The number of Customs officers trained in the first phase did not achieve the PI of 25 by 1 January 2002. However, in the second phase in September and October 2007, 291 customs officers and 30 SNCP inspectors were trained in 10 courses each of 2-days. The number of Customs officers trained in the second phase therefore exceeded the Performance Indicator of 200 but did not achieve this number by the due date of December 2003.

3511. The 2-day programme familiarized the officers with the issues and activities to combat illegal trade, including a description of the Montreal Protocol and ODS, the Refrigerant Management Plan, licensing system, HS codes for refrigerants, customs regulations, and methods for smuggling ODS. Officers learnt how to examine ODS safely, and how to identify types of refrigerants using the identifiers. At the end of the course the officers sat an examination. Basic manuals included "*Training Manuals for Customs Officers*" and "*Manual for controlling the import and export of ODS and products containing ODS*".

3512. Uzbekistan hosted a Green Customs Initiative in Tashkent from 14-17 February 2006. The meeting resolved to have greater regional cooperation to combat illegal trade by electronic data exchange of electronic licences, procedures to exchange information on export and import consignments between countries, and to establish joint training sessions for customs officers. Since the end of the Project, some Customs Officers also attended a training course in Thailand in 2008 to continue to improve skills in ODS detection.

3513. In Uzbekistan, there are 14 regions and about 4000[573] customs officers. The SCC received 19 Refrigerant Identifier Machines (RIMs) in August 2003. Fifteen were deployed to officers at the border, 2 were kept in laboratories and 2 were kept in the teaching venues. The Customs reported that they were generally satisfied with the operations of the RIMs. The officers use standard samples of HCFC-22 which have been checked with 99% purity to calibrate the RIMs. Certificates of accuracy have not been requested in court cases, but these could be provided if requested.

3514. Custom officers check the labelling of the cylinders and the documentation. If they suspect that

[572] The sub-project started 23 April 2001; intended finish date in December 2004; actual finish in December 2007
[573] The precise number of officers is confidential.

these are not in order, the refrigerant is tested using the RIM. The Customs also look for behavioural cues in the truck drivers e.g. nervousness. There is a check to make sure that drivers have not deviated from their intended destination for the ODS delivery. The small fine for smuggling in Uzbekistan is apparently compensated for by the '*…additional scrutiny and administrative delay*…' that drivers must face when returning for a subsequent customs check.

8.12.5.2.2 Relevance

3515. The training activities on ODS handling and best practice management were relevant to the Montreal Protocol which requires Parties to take appropriate measures to protect the environment against adverse impacts of that result from human activities which modify or are likely to modify the ozone layer. The activities are consistent with the GEF's strategic objective of, *inter alia*, preventing and minimising the emissions of ODS. Reduced emissions also help to mitigate against climate change since ODSs are also powerful radiative forcing agents. Further information on these aspects was provided in paragraphs 3409 to 3412 above.

3516. The government aimed to have all personnel operating in this sector certified, and all enterprises to be licensed. Some of the ODS legislation targets technicians that repair, service and assemble ODS equipment. The training programmes were therefore consistent with the aims of the government.

3517. Enterprises were financially encouraged to ensure technicians were trained as ODS they recovered and reclaimed was tax-exempt.

8.12.5.2.3 Efficiency

3518. The cost of the training component was $134,244 to train a total of 1200 Customs officers, SCNP staff, and refrigeration technicians. This equates to approximately $112 per technician which compares favourably with training costs in other countries (e.g., $488 / trainee in Tajikistan).

3519. The training targeted 15.5 ODP-tonnes of ODS saved as a result of the training (Table 73 on page 641), which was equivalent to about 10% of the quantity to be phased out. The NOU calculated amount of ODS saved as a result of the training programmes as 15 ODP-tonnes, which was very close to the amount targeted.

3520. There was a lag in the implementation of the Phase 1 and Phase 2 of refrigeration technicians and customs officers of about 5 years. The efficiency of the implementation and avoided emissions would have been greater if the entire programme had been conducted as close as possible to the earlier year when ODS was more prevalent.

8.12.5.3 Assessment of Sustainability of project outcomes

8.12.5.3.1 Financial resources

3521. The courses were delivered within the budget allocated by UNEP for this sub-project. Each trainee paid about $35 for the training which was reimbursed by their employer.

3522. Technicians were recommended to renew their qualifications every 3 to 4 years, in order to remain up to date with best practice. Despite this recommendation and the seemingly modest cost for training, there have been no technicians trained after 2007 when the project finished which indicated that further training is not possible without financial support, and therefore the project is not sustainable.

3523. There was no Greencard system that is used by technicians to prove to potential customers that they are qualified and registered to work with refrigerants and refrigeration equipment, which was present in some of the other CEITs. Such a system encouraged customers to hire trained rather than untrained technicians.

3524. There was also no Refrigeration Association that could assist the Government with the delivery of courses to technicians. This aspect is discussed further in paragraph 3554.

8.12.5.3.2 Socio-political

3525. The training was satisfactorily completed and was useful in supporting phase-out. This was a view shared also by the refrigeration service enterprises. The training courses were reported by enterprises to have given practical guidance to technicians, which was evident to the employers when the technicians returned to work and were able to competently carry out repair and

maintenance work.

3526. Despite the high value placed on training of technicians by enterprise managers, there was no stakeholder ownership of the training infrastructure by enterprises that could encourage the delivery of courses for technicians. A Refrigeration Association could be useful in this regard (see paragraph 3554) as well as legislation that mandates initial training and refresher courses for technicians (see paragraph 3528).

8.12.5.3.3 Institutional framework and governance

3527. The training was carried out in 13 locations, including Tashkent State Technical University where it has been added as a course in the curriculum.

3528. One of the problems identified was that there was no legislative requirement to compel refrigerant technicians to be qualified, and there is no requirement for qualified technicians to undertake refresher courses to keep abreast of the latest techniques.

3529. To address this omission, the SNCP has drafted legislation that required all businesses that repair, assemble or service refrigeration and air conditioning equipment to be licensed. The legislation will help to reduce the number of unlicensed technicians, but is expected to take several years to be adopted.

3530. Legislation was also drafted in other areas because of deficiencies in the programme that were highlighted as a result of the training courses. For example, the NOU realised that codes of practice for refrigeration servicing and repair were not available. The NOU drafted and published legislative and regulatory norms for codes of refrigeration practice. These norms were assessed as a useful step that would encourage even better control of emissions of refrigerants than were in place originally. They also demonstrate the commitment of the government to a programme of continuous training of technicians.

8.12.5.3.4 Environmental

3531. The lack of ongoing training for Customs officers increases the risk of illegal trade not being intercepted at the border. In addition, the 450-500 unregistered technicians in Uzbekistan will continue to service equipment using methods that may not be best practice, and therefore emissions of ODS are likely to continue. ODS emissions are likely to damage the ozone layer and delay its recovery.

8.12.5.4 Catalytic role

3532. The government-run training programme for technicians was highly valued by employers to the extent that some of the larger operations emulated the government initiative and developed their own training programmes.

3533. Shark Shaboda, which was established in 1968, assembles, installs, repairs and services air conditioning and commercial refrigeration equipment. They employ about 100 technicians. Shark Shaboda regarded the training as very important. Two employees of the company became national trainers. They deliver training courses in the company to technicians each year as a refresher course, including a surprise test of skills. Other companies are invited to Shark Shaboda's training courses.

8.12.5.5 Achievement of outputs and activities

8.12.5.5.1 Delivered outputs

3534. Please refer to Sections 8.12.5.2.1.1 (Refrigeration technician training) and 8.12.5.2.1.2 (Customs officer training). The Performance Indicator of 25 technicians trained by 1 June 2001 was met and exceeded. The Performance Indicator of 380 technicians trained by July 2002 was met and vastly exceeded.

8.12.5.5.2 ODS awareness, ODS substitute technology and strengthening of institutional capacity for training

3535. As a part of the training course, an expert on the Montreal Protocol provided information to trainees on the damage to the ozone layer caused by ODSs, and the impact of ODSs on human, animal and plant life. In general, the courses emphasised the long term solution of replacing

ODSs and ODS-dependent technology with ODS-free technology, but in the short term a viable solution was to minimise emissions to the atmosphere through best practice service of equipment.

3536. The courses took place over 5 days and covered:

- Depletion of the ozone layer, cause and effect
- Refrigeration technology overview
- Basic concepts of refrigeration technology
- General efficient methods of maintenance
- Maintenance practice
- Types of refrigeration (commercial, small air-conditioners, automotive, practical training
- Recovery, recycling and utilisation
- Alternative refrigerants and technologies
- Safety precautions for refrigerator operation and maintenance

3537. The institutional capacity for delivering the training courses was increased by including the training course as an option for students to select in the curricula of the Tashkent State Technical University, the Navoi Mining College, the Karshi Engineering-Economic Institute and the Tashkent Chemical-Technical Institute.

8.12.5.5.3 Authority / credibility, necessary to influence policy and decision-makers

3538. The training courses initiated by the NOU were regarded positively by the policy and decision makers in the government, educational and industrial sectors. The training project is a priority within Government and at the Ministry level (State Committee for Nature Protection). Measures and regulations on ODS have been put in place. In accordance with the Governmental Decree, it was necessary to provide support to companies and entrepreneurs putting into practice ozone safe servicing procedures and technologies. The NOU had the authority / credibility necessary to influence policy and decision-makers.

8.12.5.6 Assessment of Monitoring and Evaluation Systems

8.12.5.6.1 Monitoring and evaluation design

3539. UNEP's monitoring and evaluation design for the training sub-project consisted of recording the number of additional refrigeration technicians and customs officers that were trained in each reporting period, and the total number trained to date compared with the target agreed in the Memorandum of Understanding signed in 2000 at the start of the training programme. In addition, UNEP relied on the report of the Protocol's Implementation Committee to determine if the Party had not complied with the ODS reduction requirements agreed by the Parties, which in turn was based on report to the Ozone Secretariat submitted by Uzbekistan.

3540. UNEP acknowledged that the training sub-project contained poor design and performance indicators that tended to focus mainly on quantitative reporting rather than qualitative feedback. Risk Analysis was also not a part of project design which made it difficult to predict the sustainability of projects after the funding ceased. UNEP considered it would have been useful, for example, to have included a peer review of the national curricula related to refrigeration technician and Customs officer training, which would have added an important qualitative element to the project monitoring and evaluation design.

3541. The assessment team agrees with UNEP's acknowledgment of the limitations of the monitoring and evaluation design. The most important outcome or performance indicators were not developed, such as a reduction in ODS consumption as a result of the training of refrigeration technicians, or the quantity of illegal ODS intercepted by Customs officers as a result of their training. SMART indicators and data analysis systems were not used. A baseline, performance indicators and reporting system for these indicators was not part of the design, and therefore the success of the training sub-project could not be adequately measured.

8.12.5.6.2 Monitoring and evaluation plan implementation

3542. A quantitative monitoring and evaluation plan was not put in place, as described above. However, the NOU provided regular, comprehensive and thorough reports to UNEP on progress implementing the training project, and suggested amendments to the implementation of the monitoring and evaluation plan when, for example, the funding tranche was late arriving and the training courses needed to be delivered in the last half of the year instead of the first half. UNEP typically scored the reports as highly satisfactory, as the numbers trained exceeded the number agreed in the MOU.

8.12.5.6.3 Budgeting and Funding for monitoring and evaluation activities

3543. No information was provided by UNEP DTIE or DGEF on the amount budgeted and funded for monitoring and evaluation activities for the training sub-project.

8.12.5.6.4 Long-term monitoring

3544. As training ended at the same time as the GEF funding there has been no long term monitoring of any aspect of the training programme.

8.12.5.7 Assessment of processes that affected attainment of project results

8.12.5.7.1 Preparation and readiness

3545. In preparation for the training courses, the NOU and teachers at the Tashkent State Technical University prepared appropriate training modules for both service technicians and engineers. The Russian version of the UNEP manual "*Good Practices in Refrigeration*" was amended and translated into the Uzbek language.

3546. In 2001 the training module was included in the educational programme for Bachelors and Masters Degrees at the Tashkent State Technical University (TSTU) and in the Navoi Mining College. In 2003 the training module was included in the program of the Karshi Engineering-Economic Institute and the Tashkent Chemical-Technological Institute.

3547. The NOU consulted stakeholders prior the start of the training: the SCNP, the State Customs Committee, the Agency of Foreign Economic Relations, the Association "Uzmashsanoat", the Center of Science and Technology, the Company Uzteleradio, the State Committee for Printing, the Ministry of Higher and Secondary Technical Education, higher-educational institutions and NGOs.

3548. The NOU prepared legislation that compelled actions by entities and the government related to ODS activities. This legislation required entities and individuals carrying out ODS-related activities to maintain records of ODS use and to switch to ozone-safe technologies (the Law "On Air Protection"). Moreover, the government was obliged by the same legislation to assist such entities and individuals to comply with the legislation, and training was the main way that this could be achieved.

3549. The training syllabus was judged by the evaluation team as comprehensive as it covered both theory and workshop practice: ozone layer depletion and global warming, refrigeration technology and refrigerants, thermodynamics, maintenance including leak detection and equipment, commercial and domestic refrigerators, mobile and stationary air conditioners, extracting-refining-recycling refrigerants, alternatives to ODS, and worker safety. Students had to pass an examination to be accredited. Guidebooks for the courses were translated into Russian[574]. TSTU added a special section to a degree course on 'refrigerants', as a result of the additional interest in Uzbekistan on refrigerant management.

8.12.5.7.2 Country commitment and motivation

3550. Uzbekistan demonstrated a high level of country commitment to the training programme at a government and enterprise level, as shown by the large number of refrigeration technicians and Customs officers trained. However, after the funding ended, there was no legislative requirement for qualified personnel to renew their training, even though technicians were recommended by the NOU to renew their qualifications every 3 to 4 years, in order to remain up

[574] "Best practices of refrigerating equipment" and "Chillers and refrigerant management".

to date with best practice. And there were no courses available for unqualified personnel as the government was not financially supporting such courses, even though the NOU estimated that about one-third of the technical workforce had yet to be trained.

3551. There was also no requirement or encourage for consumers to employ qualified technicians. A Greencard system that is used by technicians to prove to potential customers that they are qualified and registered to work with refrigerants and refrigeration equipment was not operational in Uzbekistan, as in some of the other CEITs. Such a system encouraged customers to hire trained rather than untrained technicians.

3552. As an indicator of Uzbekistan's commitment to training, the SNCP has drafted legislation that will require all businesses that repair, assemble or service refrigeration and air conditioning equipment to be licensed. The legislation will help to reduce the number of unlicensed technicians, but is expected to take several years to be adopted.

3553. Legislation was also drafted in other areas because of deficiencies in the programme that were highlighted as a result of the training courses. For example, the NOU realised that codes of practice for refrigeration servicing and repair were not available. The NOU drafted and published legislative and regulatory norms for codes of refrigeration practice. These norms were assessed as a useful step that would encourage even better control of emissions of refrigerants than were in place originally. They also demonstrate the commitment of the government to a programme of continuous improvement in ozone layer protection.

8.12.5.7.3 Stakeholder involvement

3554. The NOU consulted with a range of stakeholders including the State Customs Committee, the Agency of Foreign Economic Relations, the Association "Uzmashsanoat", the Centre of Science and Technology, the Company Uzteleradio, the State Committee for Printing, the Ministry of Higher and Secondary Technical Education, higher-educational institutions, various entreprises that were involved in servicing of refrigeration and air conditioning equipment, and NGOs.

3555. The NOU also recognised the value of a Refrigeration Association that would help to deliver training, which is present in some of the other CEITs but not present in Uzbekistan. To address this issue, the NOU drafted the legislation to facilitate the establishment of a Refrigeration Association. Although the first Association of Refrigeration Technicians was established recently (based on the Tashkent State Technical University (TSTU)), it had yet to be registered with the Department of Justice[575], which can take several years because of the political nature of the Association.

3556. The NOU saw the role of the Association as being particularly valuable for assisting with the delivery of the training programmes and for providing practical advice to the government on future legislation affecting refrigerants, among other activities.

8.12.5.7.4 Financial planning

3557. The NOU remained within the allocated budget for the training programmes, and reported regularly on the drawdown on this budget to UNEP. There were delays, however, in the provision of funds to Uzbekistan for training which resulted in rescheduling of the training programme by the NOU for period about 6 months later than planned.

8.12.5.7.5 UNEP / UNDP supervision and support

3558. There were no field visits to Uzbekistan by UNEP to gain firsthand experience on the implementation of the training programme for refrigeration technicians and for Customs officers.

3559. All of the supervision was provided on the basis of quarterly, half yearly and annual reports submitted by the NOU to UNEP, which themselves contained recommendations to UNEP on the most appropriate modification to make to the training programme as a result of a problem encountered. In the case of Uzbekistan, the recommendations were accepted and the training proceeded as recommended, and therefore there was little to no supervision by UNEP.

[575] Association leadership has the same standing as a politician. Association establishment can take several years.

8.12.5.7.6 Co-financing and project outcomes & sustainability

3560. There was no co-financing of the sub-project as this was not a requirement of the GEF funding.

8.12.5.7.7 Project implementation delays and impact on project outcomes & sustainability

3561. UNEP was reported by the NOU to be late delivering the Manuals for the training programmes, and late making payments for the training that had been undertaken. It was unfortunate that the training was late as this meant the 3R equipment had to be stored. Once the training was finished, the 3R equipment could be send to the companies that had trained technicians.

3562. There is no sustainability in the training programme as once the GEF funding ceased so did the training programme. UNEP may wish to consider implementing a requirement in the future for co-financing from various stakeholders in order to promote sustainability, such as co-finance from the Education Ministry, co-finance from the enterprises that benefit from the training as a result of having technicians that perform more effectively (a 'fee' for training), or co-finance from the institutes that deliver the training as this is an investment in obtaining a fee from trainees/enterprises for delivery of courses at a future time. It would be feasible to obtain co-finance from several sources, which would help to promote sustainability in the event that one of the sources withdrew their funding in the future.

8.12.5.8 Sub-Project Rating

GF/4040-01-15- Training of trainers for use of ODS-free refrigerants, including training of custom officers (UNEP)		
Criterion	**Evaluator's Summary Comments**	**Evaluator's Rating**
Attainment of project objectives and results Sub criteria (in yellow below)	See comments below	HS
Effectiveness	The number of refrigeration technicians and Customs officers trained exceeded those agreed	HS
Relevance	Training in best practices for servicing ODS equipment, and in intercepting illegal trade in ODS, are consistent with minimising the detrimental effect of ODS on the ozone layer	HS
Efficiency	A relatively small team in the NOU leveraged national resources to coordinate training in a cost-effective and timely manner	HS
Sustainability of Project outcomes (overall rating) Sub criteria (in yellow below)	See comments below	S
Financial	Delivered within budget, but sustainability is non-existent	S
Socio-Political	No stakeholder ownership of the training and no continuity of training	S
Institutional framework and governance	Legislative requirements for training do not exist. Further legislation pending.	S
Environmental	Lack of training of refrigeration technicians and of customs officers puts at risk the gains	MS

GF/4040-01-15- Training of trainers for use of ODS-free refrigerants, including training of custom officers (UNEP)		
Criterion	**Evaluator's Summary Comments**	**Evaluator's Rating**
	in ozone layer protection	
Achievement of outputs and activities		
Monitoring and Evaluation (overall rating) Sub criteria (in yellow below)	See comments below	MS
M&E Design	Appropriately M&E design not established by UNEP	MS
M&E Plan Implementation (use for adaptive management)	Adaptive management led by Uzbekistan rather than UNEP as a result of deficiencies in the M&E plan	MS
Budgeting and Funding for M&E activities	Delays in funding puts reduced the potential gain in ozone layer protection	MS
Catalytic Role	No rating requested	
Preparation and readiness	Well prepared as a result of stakeholder consultation, course content development and fundamental legislation on ODS	HS
Country commitment and motivation*	High level of country commitment, but specific legislation requiring training is missing which precludes sustainability of training	S
Stakeholders' involvement	High level of effective stakeholder involvement	HS
Financial planning	Executed within budget by Uzbekistan, but deficiencies in timing of funding tranches by UNEP resulted in delays to training	S
UNEP supervision and support**	Minimal supervision and guidance	S
Overall Rating		S

Highly Satisfactory (HS); Satisfactory (S); Moderately Satisfactory (MS); Moderately Unsatisfactory (MU); Unsatisfactory (U); Highly Unsatisfactory (HU);
*Motivation replaced TOR '*driveness*'; **Support replaced TOR 'backshopping'

8.12.6 UZB/98/G31 National programme for recovery and recycling of ODS refrigerants (UNDP/UNOPS)

8.12.6.1 Introduction

3563. This programme that was agreed between UNEP and the government of Uzbekistan aimed to recover, recycle and reclaim as much refrigerant as possible during the transition period between CFCs and CFC-free technology, at a time when imports of CFCs to Uzbekistan were banned. Therefore, the only available CFC refrigerant to service existing equipment was obtained from the CFCs in the market that were recovered, recycled and reclaimed.

3564. The sub-project was an important element of the Refrigeration Management Plan as part of

Uzbekistan's Country Programme. The bulk of the CFC consumption was in the refrigeration servicing sector. The first part of the programme was discussed above (Training of technicians in refrigeration management) while the second part of the programme (Recovery, recycling and reclamation equipment, or 3R) is discussed below.

3565. As a condition of accepting the equipment, and supported by legislation, each company was required to report to the NOU for the duration of the project on a quarterly basis on the quantity of ODS recovered and recycled. The NOU also visited the companies frequently and included comments on the operation of the programme as a result of the visits in the quarterly reports to UNEP. The programme was managed at the practical level by the deputy head of the NOU who himself was a qualified refrigeration engineer.

3566. The results reported to the NOU were analysed according to the quantity of ODS recovered per machine. Machines that were not being sufficiently used were re-allocated to other companies where the amount recovered per machine was better. Companies were required to pay for any equipment that was lost or stolen.

3567. The information that was received by the NOU from the companies, and the reports the visits by the assessors to the companies, provided the basis for the comments below.

8.12.6.2 Attainment of objectives and planned results

8.12.6.2.1 Effectiveness

3568. There were no specific achievement or performance indicators that were developed for this project. Effectiveness could be evaluated by assessing:

- The quantity of equipment supplied for recovery and recycling of ODS;
- The number of servicing enterprises and servicing centres that received the equipment;
- Training of technicians in best-practice ODS recovery and recycling;
- The amount of ODS recovered, recycled and destroyed as a result of the sub-project.

3569. The achievement of outputs and activities by Uzbekistan in this sub-project on recovery and recycling of ODS, as measured against these performance indicators, are provided in Section 8.12.6.5.1 "*Delivered outputs*" on page 669.

8.12.6.2.2 Relevance

3570. Reduced emissions of ozone-depleting substances in Uzbekistan, as a result of the implementation of this ODS recovery and recycling programme, is consistent with the objectives of the Vienna Convention and the Montreal Protocol, which *requires Parties to take appropriate measures in accordance with the provisions of this Convention and of those Protocols in force to which they are party to protect human health and the environment against adverse effects resulting or likely to result from human activities which modify or are likely to modify the ozone layer*[576]. The distribution of 3R equipment was partnered by the training programme in the best practice use of the 3R equipment (see Training above).

3571. The GEF established in 1995 an Ozone Layer Depletion Focal Area in response to the Montreal Protocol. The Focal Area has the strategic objective of protecting human health and the environment by assisting countries to phase out their consumption and production of ODS, to prevent emissions of ODS, and to encourage the uptake of alternative technologies and practices according to a country's commitments under the Montreal Protocol. The financial interventions in the GEF Focal Area contribute to the return of the ozone layer to pre-1980 ozone levels, which is expected by 2065.

3572. Most recently, the dual capability of ODS to both reduce ozone and to have a detrimental impact on the climate have been described[577]. Global ODS consumption in 1989 was equivalent to about 9,200 million tonnes (9 Gt) CO_2-eq/year, which was reduced to about 1,870 million tonnes (1.8 Gt) CO_2-eq/year in 2007 as a result of ODS phase-out activities under the Montreal Protocol.

---

[576] Handbook for the Vienna Convention for the Protection of the Ozone Layer - 7th Edition (2006). Article 2: General Obligations.

[577] Velders, J.M., Andersen, S.O., Daniel, J.S., Fahey, D.W. and M. McFarland. 2007. The Importance of the Montreal Protocol in protecting climate. http://www.pnas.org/content/104/12/4814.abstract

This reduction of about 7 Gt CO_2-eq/year was at least three times greater than the Kyoto Protocol's reduction target (about 1-2 Gt CO_2-eq/year in 2008-2012), demonstrating that the global ODS reductions achieved so far have already yielded a larger climate benefit than the current Kyoto Protocol target.

3573. The actions taken by Uzbekistan to phase out ODS is therefore relevant to further protection of the ozone layer (Montreal Protocol), accession to the EU, and relevant to reducing the impact of radiative forcing of the climate (Kyoto Protocol).

8.12.6.2.3 Efficiency

3574. For a cost to the GEF of $1,327,980 Uzbekistan reported that 15 ODP-tonnes of ozone-depleting substances were phased out, compared to the targeted amount in the project of 92 ODP-tonnes per year. The amount recovered in practice was equivalent to about 16% of the amount targeted. On this basis, the cost-effectiveness of the subproject equated to $88.53 per ODP-kg.

3575. This cost-effectiveness of $88.53 ODP-kg per year was about nine times more expensive than the average cost-effectiveness of $9.60 ODP-kg per year reported for MLF-funded projects on refrigeration recovery and recycling that were implemented in 25 developing countries[578].

3576. The NOU commented that the relatively low quantity of CFCs recovered reflected the scarcity of CFCs compared to 1995 and 1996. Several of the servicing companies, who handled more CFCs in the mid-1990's than when the Project was operational, provided a similar comment.

3577. In an effort to increase refrigerant recovery, Uzbekistan re-assigned machines from poorly to highly efficient companies, based on a review of their CFC quantities recovered and recycled. In general, the amount reported as recovered and recycled by countries as lower than targeted could be due to under-reporting by the servicing companies, or an over-ambitious target initially developed in the course of sub-project formulation, or a combination of the two.

8.12.6.3 Assessment of sustainability of project outcomes

8.12.6.3.1 Financial resources

3578. As demonstrated above, some of the companies interviewed reported that spare parts were not available for the equipment, or that the parts when available were expensive. For this reason, some companies had chosen to destroy some machines in order to use their parts to keep other machines operational.

3579. These concerns expressed by some companies suggested the 3R equipment was nearing the end of its operational life, and may not be sufficiently operational to recover significant quantities of HCFCs coming up in the near future as a result of the Parties 2007 agreement for earlier reduction and more significant cuts in the consumption of HCFCs. Although HCFCs are not as ozone-depleting as CFCs, the potential lack of operational 3R equipment represents a lost opportunity for recovery and recycling of them in order to minimise their impact on the ozone layer.

3580. It is likely that the 3R machines and technician training programme are not sustainable in Uzbekistan because, in addition to equipment failure, there are a number of other deficiencies: there is no refrigeration association to assist with training, training stopped after the sub-project funding ceased, there is no legislation that requires technicians to be qualified to handle ODS and ODS-containing equipment, and there was no legislation requiring owners of 3R equipment to report to the NOU on the amounts of ODS recovered, recycled and reclaimed.

8.12.6.3.2 Socio-political

3581. The distribution of the equipment was undertaken in a satisfactory manner. Small and large enterprises as well as entrepreneurs qualified for the equipment. The distribution of the equipment to different parts of the service industry highlighted its importance in addressing socio-economic criteria important to Uzbekistan. Company financial viability was not one of the criteria for receiving equipment.

---

[578] MLF. 2000. Desk Study on Recovery and Recycling Projects. UNEP/OzL.Pro/ExCom/31/18. Data in Annex II analysed by Touchdown Consulting Brussels.

3582. There is strong political support for the programme to recover, recycle and reclaim ODS. However, deficiencies in legislation that requires technicians to be qualified to handle ODS and ODS-containing equipment increase the risk that the 3R equipment – even if it is operational - will be underutilised in the future.

8.12.6.3.3 Institutional framework and governance

3583. Precisely 742 units of 3R equipment were dispatched to 100 companies in 13 regions, including 300 manual pumps, 430 recovery machines and 12 recovery and recycling machines. Most of the machines were sent to enterprises in the Tashkent, Fergana and Fergana Oblast regions as they were the most populated. A database of the CFCs recovered per company per equipment was maintained for the life of the project. Companies that recovered the least CFCs had their equipment re-allocated by the NOU to companies that recovered more, as the NOU wanted to maximise recovery of ODS.

3584. These actions by the NOU at the practical level were assessed as strong project governance during the life of the sub-project. Legislation and other factors (see paragraph 3580) were not in place, however, to ensure the sustainability of the use of the 3R equipment.

8.12.6.3.4 Environmental

3585. Many Parties are currently in the process of determining appropriate restrictions on the imports of HCFCs and HCFC-dependent equipment to take into account the relatively recent changes to the HCFC control measures in the Montreal Protocol. Following the same procedures that were employed for CFCs in this sub-project, for HCFCs Parties will endeavour to reduce consumption by recovering and recycling as much as possible HCFCs that have already been placed on their market.

3586. In order to minimise losses of HCFCs already on the market, Parties will need to ensure that recovery and recycling equipment, and technician training programmes, are both fully operational. If this is not the case, there is an increased risk that HCFCs will be inadvertently released to the atmosphere thereby increasing ozone depletion.

3587. In the case of Uzbekistan, the recovery and recycling equipment and technician training programmes were both functional and worked well for the duration of the sub-project. However, based on the interviews with companies and the NOU, there is a strong likelihood that both will not be functional in the future to target HCFCs if a refrigeration association is not present to assist with training and other related activities, training of technicians is not re-established, legislation is adopted that requires technicians to be qualified to handle ODS and ODS-containing equipment, and there legislation is adopted that requires owners of 3R equipment to report to the NOU on the amounts of ODS recovered, recycled and reclaimed.

8.12.6.4 Catalytic role

3588. The equipment was distributed to more than 100 companies, which covered all the main companies in Uzbekistan. Unlike in other CEITs where the distribution was more limited and companies that did not benefit from the project purchased their own 3R equipment to remain competitive, this was not the case in Uzbekistan so there was little opportunity for catalytic action in this respect.

3589. As an example of catalytic action, Shark Shaboda employs about 100 technicians that assemble, install, repair and service air conditioning and commercial refrigeration equipment. The company regarded the training of technicians as very important. Two employees of the company became national trainers. They delivered training courses in the company to technicians each year as a refresher courses, including a surprise test of skills. Other companies were invited to Shark Shaboda's training courses and to use the equipment that this company had received as a result of being a participant in this sub-project.

8.12.6.5 Achievement of outputs and activities

8.12.6.5.1 Delivered outputs

3590. There were no specific achievement or performance indicators that were developed for this project. Effectiveness could be evaluated by assessing:

- The quantity of equipment supplied for recovery and recycling of ozone-depleting substances;
- The number of servicing enterprises and servicing centres that received the equipment;
- Training of technicians in best-practice the recovery and recycling of ozone-depleting substances;
- The amount of recovered, recycled and destroyed ozone-depleting substances as a result of the sub-project.

3591. The delivered outputs are discussed for each of these performance indicators.

8.12.6.5.1.1 Quantity of equipment supplied for recovery and recycling

3592. The 3R sub-project received 300 manual vacuum pumps, 430 TX-200 RTI recovery units, 12 recovery and recycling machines, and a range of other equipment[579].

8.12.6.5.1.2 Servicing enterprises and servicing centres that received the equipment

3593. The 3R equipment was dispatched to 100 companies in 13 regions. Most of the machines were sent to enterprises in the Tashkent, Fergana and Fergana Oblast regions as they were the most populated.

3594. The 12 recovery and recycling units were allocated to 11 companies. Allocations were made on the basis of the number of technicians located in each enterprise, and the ability of the enterprise to recover and recycle ODS.

3595. The effectiveness of the programme was discussed with five companies that received the 3R equipment and that were visited by the assessors: Savdotekhnikamontazh (Tashkent); Shark Shaboda (Tashkent); Yo'L REFTRANS (Syrdarya); Kerio Servi (Samarkandt); Savodo Teknika (Samarkandt).

8.12.6.5.1.3 Savdotekhnikamontazh refrigeration service and sales

3596. Savdotekhnikamontazh is the largest of the retailers in Tashkent that assembles, installs, repairs and services commercial refrigeration equipment. The company, which has been in operation since 1949, currently employs about 100 technicians. At the time of the 3R subproject, they employed over 200 technicians.

Figure 48: Refrigeration unit from a refrigerated railway wagon. *Yo'L REFTRANS, Uzbekistan*

3597. Savdotekhnikamontazh received a range of equipment and tools including 106 recovery machines, 54 hand pumps and 2 reclamation units. They said that the tools were not particularly suitable for the work, and the hand-pumps were inefficient and not used as much as the recovery machines. Spare parts were supposed to have been supplied but they did not receive them. Obtaining spare parts from RTI (such as hoses[580], filters and pressure meters) has been impossible, so they cannibalized 16 of the recovery machines to keep the remaining 90 operational.

3598. The technicians were trained in the use of the machines (see previous sub-project). The traing of the technicians was highly valued by Savdotekhnikamontazh as this improved their skills, increased the volume of work and improved company profitability. Training continues to take place in Spring every year.

[579] 12 detectors; 12 vacuum pumps; 24x1000 lb cylinders; 12 leak detectors; 1350 x 30 lb cylinders; 60 x 100 lb cylinders; and a range of tools, and spare parts for the equipment

[580] A hose pipe costs $22-$37 to replace. Relative to a technician's salary of $100 per month, the hoses are expensive.

3599. Old CFC refrigerators are the main sources of CFCs, which are located in the summer houses. In the past, Savdotekhnikamontazh imported 300t of CFCs per year to service commercial refrigerators and chillers, but these have since been replaced with non-CFC equipment.

3600. Savdotekhnikamontazh reported that about 20t of CFCs were slowly leaking for their storage facilities. The company regretted that there were no disposal or destruction facilities for stored ODS that was no longer required.

Figure 49: Refrigerated railway wagon. *Yo'L REFTRANS, Uzbekistan*

3601. Quarterly reports were still submitted to the NOU, even though the project finished in 2002. The most common refrigerants in order of quantity were reported to be M1LE, HCFC-22, HFC-134a (for MAC), and R404a for low temperature. Isobutane was rarely used. M1LE in 2009 was $7.60/kg, HCFC-22 $6.50/kg, and R404a $16/kg. In 2001 during the project CFC-12 was $3/kg, and the black market price in 2009 is $5/kg which is less than the price of HCFC-22 (see Section on Illegal Trade in this Chapter). A company looking for cheap refrigerant was therefore more likely to buy illegal CFCs than legal HCFCs.

8.12.6.5.1.4 Yo'L REFTRANS railway wagon refurbishment facility

3602. Yo'L REFTRANS[581] is a large workshop facility that specializes in the refurbishment of railway wagons that are used for transporting refrigerated products (Figure 48 and Figure 49). Previously it was the second largest such facility in the Soviet Union.

Figure 50: ODS reclamation equipment and storage cylinders (above), and recovery equipment (below). Shark Shaboda, Uzbekistan.

3603. The company was allocated 12 recovery machines and 1 reclaim unit by the sub-project. Ten years ago the enterprise employed 4,500 workers. Today, the number employed has dropped to 1,600 workers due to the difficult economic times. However, business was reported to be increasing because of a Presidential Decree to grow 50,000t more food in Uzbekistan, which in 2007 resulted in 200 wagons being used to export cherries and apricots to Russia.

3604. More than 130 of their technicians had been trained in refrigerant recovery and reclamation. Quarterly reports were provided to the NOU.

3605. The company has stored about 120t of CFCs to service refrigeration units in 200 wagons.

3606. About 25% of the wagons have been retro-fitted to operate on HFC-134a or ML1R, but most still operate on CFCs. The leakage rate of the units was estimated to be about 15% per year. The life of the refrigeration

[581] Since 2006, ownership is 51% state and 49% Korean.

equipment was expected to be 12-15y, but this has doubled as a result of regular servicing every 5000 hours of operation. Yo'L REFTRANS did not have any plans to prematurely end the use of CFCs, but the NOU was interested in pursuing options to retire their use as soon as possible because of their potential global warming and ozone depletion impact.

8.12.6.5.1.5 Shark Shaboda refrigeration service and sales

3607. Shark Shaboda was established in 1968 and assembles, installs, repairs and services air conditioning & commercial refrigeration equipment. They employ about 100 technicians.

3608. Shark Shaboda received a range of equipment and tools including 30 recovery machines, 10 hand pumps and 1 reclamation unit (Figure 50). All of the machines were still operational. The company reported that the 3R machines helped with the profitability of Shark Shaboda. Since the project commenced, more than 2.5t of CFC-12 and 20t of HCFC-22 has been recovered and recycled, which represents a saving to the company of about $15,000 per year for HCFC-22 alone. Shark Shaboda reported on the amount recovered every quarter to the NOU. The number of clients increased as a result of the 3R equipment.

3609. The company has the contract to service several important buildings in Tashkent including the Senate and the Cabinet of Ministers[582]. The Senate building used to have a CFC-based chiller for air conditioning, but it has since been converted to operate on R407a. The Cabinet of Ministers building is still air conditioned by a CFC-chiller and the company is waiting for approval to convert it to HCFC-22 or 407a, as their supply of CFC-12 is down to 1,400 kg.

3610. The company's comments on the lack of spares and resultant operational problems were very similar to those described by Savdotekhnikamontazh. The company was concerned that the machines would not be sufficiently operational to recover HCFCs when they would be needed most in the future, as they were at the end of their life.

8.12.6.5.1.6 Kerio Servi refrigerator service

3611. Kerio Servi is a small domestic refrigerator repair and service shop in Samarkandt. The shop received one recovery machine. The shop serviced about 100 fridges per year. There were 4-5 similar businesses in Samarkandt (population about 1 million).

3612. Most of the fridges that were serviced operated on CFC-12 (90%), and the remainder on HFC-134a. The shop recovered and recycled 24-30 kg of CFCs each year in 2007 and 2008.

3613. Kerio Servi reported that the equipment had helped his business to be profitable as it reduced the need to purchase CFCs.

Figure 51: CFC-12 compressor from China. *Savodo Teknika, Uzbekistan*

8.12.6.5.1.7 Savodo Teknika refrigerator service

3614. Savodo Teknika is a small domestic refrigerator repair and service shop that received 10 recovery machines and one reclamation unit. The manager was also a licensed trainer.

3615. The shop serviced about 60 fridges per year, half of them operating on HFC-134a and the remainder on CFC-12. The shop replaced faulty compressors with CFC-12 compressors that were reported to be imported from China[583] (Figure 51). Obtaining filters for the RTI units was a problem. The business had increased as a result of the 3R equipment.

8.12.6.5.1.8 Training of technicians

3616. In the period from the first training course on 23 April 2001 to the last in the sub-project on 3 December 2007[584], 853 personnel were trained by 9 trainers in 35 courses, each 5 days and held at 13 locations. This included 127 specialists from the Syrdarya refrigerating depot that were

---

582 Other buildings include the Conservatory Music School, the State Committee for Property, the Beijing Cooperation and Organisation Building, and the residence of the President. They all operate on HCFC-22.

583 Illegal if they were imported after 1 January 2005.

584 The sub-project started 23 April 2001; intended finish date in December 2004; actual finish in December 2007

trained by specialists at the depot. The Performance Indicator of 380 technicians trained by July 2002 was therefore met and vastly exceeded.

3617. Further details on the training of refrigeration technicians are provided in Section 8.12.5.2.1.1 on page 658.

8.12.6.5.1.9 Amount of recovered, recycled and destroyed ozone-depleting substances

3618. The companies that received the 3R equipment were obliged in the contract (not by legislation) to report on the results of the recovery, recycling and reclamation programme[585]. These reports contributed to the results shown in Figure 52, which show a change over time in the type and quantity of refrigerants recovered and recycled. CFCs (blue line) declined rapidly from 2001 to 2003 and were replaced mainly with HCFCs (red line), then M1LE and HFC-134a.

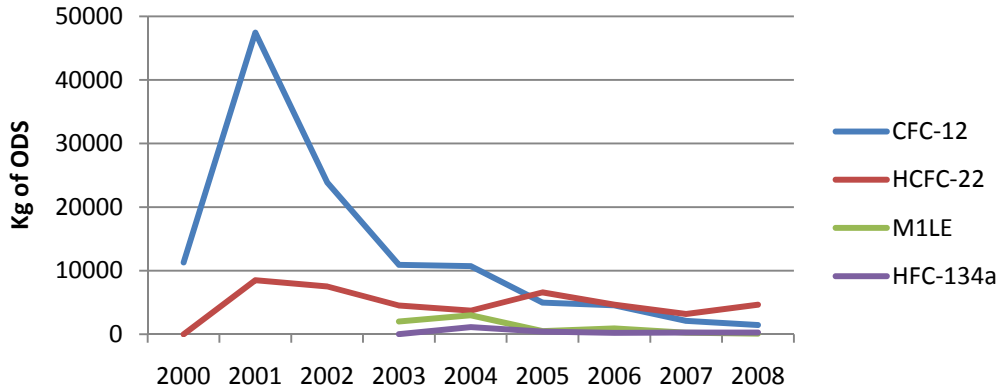


Figure 52: Total quantities of CFC-12, HCFC-22, M1LE and HFC-134a recovered in Uzbekistan

3619. Most (about 70%) of the total CFCs (83 tonnes) were extracted during the first 3 years of the project period from 2000 until 2002, and then the quantities recovered reduced significantly. About 117 tonnes of CFCs were extracted from 2000 to 2008, and of these about 8 tonnes were recycled (about 7%). In general, the quantities of all refrigerants recovered declined after 2003. After the sub-project concluded from 2003 to 2008, 44 tonnes of HCFCs, 7 tonnes of M1LE[586] and 2 tonnes of HFC-134a were also reported to have been extracted but not recycled. The absence of filters for the machines precluded recycling of ODS.

3620. The project targeted 92 tonnes per year, so the amount recovered of an average of about 15 tonnes per year was less than targeted. The NOU commented that they were not particularly satisfied with the amount of CFCs that were recovered, but attributed the relatively small amount to the fact that CFCs were not as prevalent as in 1995 and 1996. This view was also shared by several of the servicing companies, who handled more CFCs in the mid-1990's than when the Project was operational.

8.12.6.5.2 Awareness about ODS, ODS substitute technology, and strengthening of institutional capacities for dealing with ODS phase-out

3621. The training courses for technicians to implement best-practices in the use of the 3R equipment included topics that raised the awareness of the environmental damage caused by ODS emissions, the use of ODS substitute technology, and the institutional capacity to deliver the courses (for further details, refer to paragraphs 3535 to 3537 above).

8.12.6.5.3 Authority / credibility, necessary to influence policy and decision-makers

3622. The NOU had the authority / credibility necessary to influence policy and decision-makers. The 3R equipment, in conjunction with best-practice training in its use, was a priority within Government and at the Ministry level (State Committee for Nature Protection).

3623. On this sub-project, the NOU had communications with a range of organisations including the

[585] There is no required in the legislation requiring the RSEs to report on ODS recovered, recycled and destroyed. As a result, about 30% of the companies no longer submit reports.

[586] R-22/HFC-21/R-141b as 65%/15%/20%

State Customs Committee (for the ODS identifiers), the Agency of Foreign Economic Relations, the Association "Uzmashsanoat", the Centre of Science and Technology, more than 100 companies involved in the 3R programme, the Ministry of Higher and Secondary Technical Education, higher-educational institutions and NGOs.

8.12.6.6 Assessment of monitoring and evaluation systems

8.12.6.6.1 Monitoring and evaluation design

3624. The design of the Monitoring and Evaluation showed that it was subdivided between UNDP/UNOPS and the NOU[587]. The implementation of the procurement and delivery of the 3R equipment, as well as the training and certification of servicing personnel, were undertaken by UNDP/UNOPS with assistance from the local UNDP office and NOU. The selection of the beneficiaries of the equipment, the distribution of the equipment, contract agreements with beneficiaries, as well as operational control and monitoring of R&R activities, and reporting on the amount of ODS recovered and recycled, were the responsibilities of the NOU.

3625. The expected results of the project to be monitored are formulated as follows in the project document:

- Improved training of technicians in the refrigeration and air conditioning sector thereby reducing leaks and emissions during servicing and maintenance;
- The recovery of refrigerant prior to retrofitting, dismantling and scrapping operations;
- Creation of the necessary infrastructure within the country for the collection, recycling and distribution of all recovered CFCs;
- Encouragement service workshops and companies to maintain their own recovery systems and/or equipment, whether directly included in this programme or not; and
- Expected reduction of a minimum of 91.48 ODP tonnes / year of imported CFC-12.

3626. The Project Document contains the timetable with major milestones such as approval of the project by the GEF, procurement and delivery of equipment, conducting demonstration seminars, distribution of equipment, starting recovery and recycling operations, setting up the monitoring system, project review and reporting results. The implementation schedule indicates the time interval (a quarter of the year) as a target for the accomplishment of specific milestones without linkages to specific dates. The timetable is the only monitoring tool to track progress towards achieving project outputs. The ODS reduction is the only measurable indicator that was incorporated in the Project Document. There were no qualitative appraisal criteria, such as the performance of different types of equipment, its ease of use, or its ability to recycle ODS.

3627. The Monitoring and Evaluation design envisaged the evaluation of the progress as a result of evaluation missions by the UNDP consultant, and preparation and signing the project completion report by representatives of the government of Uzbekistan (SCNP), UNDP and the NOU. A budget of $6000 was allocated for the evaluation missions, which was to be undertaken at least twice during the life of the sub-project.

8.12.6.6.2 Monitoring and evaluation plan implementation

3628. The sub-project started about 9 months late (on 3 Nov 2009) and finished about 19 months later than scheduled (on 25 Sep 2002). There was an initial equipment distribution in October 2000, and then an additional distribution in 2001 and 2002. Equipment re-distribution by the NOU became necessary when the equipment that had been distributed was not being used, or was being used incorrectly. For example, when technicians were fired, or when the equipment was used for the wrong purpose (recovering halon), the machines were recovered and sent to another company. The NOU maintained a database on the equipment location and functionality, and found irregularities in several cases which were partially amended through actions imposed on the companies by the NOU[588].

3629. The NOU received reports on the amount of ODS recovered, and analysed the amount recovered

[587] Project Document – Uzbekistan. 1 January 1999.

[588] For example, the Tashkent airport machine went missing and the airport reimbursed the Project for the loss. On another occasion, the equipment was sold and exported to Russia but no money could be recovered as the company was bankrupt.

by each enterprise. The amount recovered was about 16% of the target. The NOU found that some companies were more efficient at recovery and recycling ODS than others, which suggested that perhaps the company average had not been considered in the formulation of the Project. The NOU re-assigned machines from low to highly efficient companies in an endeavour to increase the amount recovered.

3630. The Monitoring and Evaluation reported that the UNDP office had been helpful in promoting efficient clearance of the equipment through customs, that the equipment was reliable, and that the services of the international consultant paid for by UNDP were helpful and much appreciated. However, there was a delay in the delivery of spare parts, difficulty assigning a company as the contact point for RTI technologies in order to provide follow-up service, spare filters were not available, and there was no way to recycle the recovered ODS. In general, the project was implemented too late after the peak of the CFCs, so that only a small part were recoverable compared to the quantity that had been available several years earlier.

8.12.6.6.3 Budgeting and Funding for monitoring and evaluation activities

3631. A budget of $6000 was allocated for the evaluation missions, which was to be undertaken at least twice during the life of the sub-project. The sub-project was completed within the allocated budget. The remaining funds were used to purchase spare parts, to pay for travel to carry out monitoring, to create a database for monitoring recovery of ODS per company, and to purchase a computer for use in the NOU office.

3632. In general, the NOU was very satisfied with the continuous technical and financial support from UNDP, and in general the operational reliability of the equipment. Further comments on the value of the 3R equipment are provided by 5 servicing enterprises (see further details in this Chapter in the Section on Enterprise Sustainability). The companies were generally positive about the 3R equipment, particularly as it meant they did not have to purchase CFCs and their profits were better.

8.12.6.6.4 Long-term monitoring

3633. The infrastructure for monitoring the ODS collection by the equipment was well established, such that the companies reported and the NOU analysed the information received. However, most companies ceased reporting when the project finished, as there was no legal obligation compelling them to report.

8.12.6.7 Assessment of processes that affected attainment of project results

8.12.6.7.1 Preparation and readiness

3634. The NOU prepared legislation that compelled actions by entities and the government related to ODS activities. This legislation required entities and individuals carrying out ODS-related activities to maintain records of ODS use and to switch to ozone-safe technologies (the Law "On Air Protection"). Moreover, the government was obliged by the same legislation to assist such entities and individuals to comply with the legislation, and training was the main way that this could be achieved.

8.12.6.7.2 Country commitment and motivation

3635. Uzbekistan demonstrated a high level of country commitment to the 3R programme at a government and enterprise level for the duration of the sub-project, as shown by the large number of enterprises that received the equipment, the large number of refrigeration technicians trained, and the monitoring that was undertaken to track the quantities of ODS recovered.

3636. As further evidence of government commitment during the sub-project, and in order to improve ODS recovery, Uzbekistan adopted legislation in 2000[589] that banned the disposal of unwanted refrigerators in a landfill, and required municipalities and companies to put in place procedures to manage the environmentally-safe recovery of ODS from the cooling circuit. Used refrigerators were sent to the metal recycling facility, after the ODS was removed from the

[589] Decision No 20. 24 January 2000.

compressor circuit but not from the foam (which contains about twice the quantity of ODS as the compressor). Failure to recover ODS from the compressors and the foam in unwanted refrigerators resulted in increased emissions of ODS when they are destroyed. It is possible that Uzbekistan will address this deficiency in the future.

3637. However, after the funding ended, there was no legislative requirement for qualified personnel to renew their training, even though technicians were recommended by the NOU to renew their qualifications every 3 to 4 years, in order to remain up to date with best practice. And there were no courses available for unqualified personnel as the government was not financially supporting such courses, even though the NOU estimated that about one-third of the technical workforce had yet to be trained. Moreover, there was no requirement for enterprises to report on ODS recovery after the project finished and most ceased reporting. Therefore, even though there was commitment by the government during the term of the project, the commitment was not evident after the project because there were no legislative (reporting, training) measures in place to create the environment that would enable the 3R sub-project to continue at its optimal level.

3638. The recovery and recycling component of the Project was achieved, despite the targeted amounts not be achieved and possibly for the reasons mentioned above. The NOU had put in considerable effort to optimise the recovery programme. Uzbekistan is one of the few countries in the survey where some 3R activity continues and information is reported to the NOU. The NOU has continued to record and analyse the amount of ODS recovered.

8.12.6.7.3 Stakeholder involvement

3639. The project involved the relevant stakeholders for information sharing, consultation and participation and in doing so it made use of the skills, experience and knowledge of key national and international organisations, regional departments and enterprises in Uzbekistan. These included UNDP locally, international consultants, and the customs committee (for equipment clearance).

8.12.6.7.4 Financial planning

3640. About 89% of the budget was allocated to the R&R equipment for which UNDP-UNOPS was responsible for procurement. The funding of training workshops was organized through the UNDP local office and the NOU.

3641. There was no delay in flow of funds associated with procurement and delivery of equipment and the implementation of the training component. According to UNDP PIR all the funds allocated for R&R project were spent by September 2002.

8.12.6.7.5 UNEP / UNDP supervision and support

3642. The UNDP consultant visited Uzbekistan in December 2000 to assess the status of the equipment that had arrived in a shipping container and to participate in decisions related to the distribution of the equipment. The consultant also provided guidance and advice to the NOU during the project as a result of communications with the NOU. The NOU was very satisfied with the regular consultative assistance provided by the international consultant.

8.12.6.7.6 Co-financing and project outcomes & sustainability

3643. There was no co-finance reported or expected in this sub-project.

8.12.6.7.7 Project implementation delays and impact on project outcomes & sustainability

3644. Although the equipment was reasonably reliable, some service companies reported that there were insufficient filters to maintain the operations of all of the machines, while other companies reported that generally spare parts for the 3R equipment were difficult to obtain. As a result some machines were no longer used, or in some cases one machine was cannibalised to keep others operational. Unreliability of the equipment increases the risk that the project is not sustainable on a broad scale. However, more than 6 years after the project was completed, there were reports of ODS recovery still be submitted by some of the enterprises which suggest that the sub-project was sustainable to some extent, within the expected commercial life of the equipment.

3645. The NOU reported that the reclamation machines were not used heavily because of the filter required replacement every 75 hours of operation. New filters were in short supply. There was also a problem with two of the reclamation units at the largest centre because of a faulty part. Unreliability of the equipment increases the risk that the project is not sustainable on a broad scale.

3646. Some companies commented that the 3R equipment would become increasingly valuable, given the restrictions coming up on HCFC consumption in the near future, and therefore there was a need to keep them operational as long as possible.

3647. Destruction of ODS was not a routine and practical option in Uzbekistan, and therefore contaminated ODS that could not be reclaimed was not destroyed. This was a point of contention for many companies who reported that they were running out of space to store contaminated ODS. Moreover, they were frustrated by the lack of solution to the problem. Prolonged storage of ODS increased the risk of emissions of ODS and risks undermining the gains made so far in the sub-project.

3648. Uzbekistan used small-scale destruction equipment located at a research facility to destroy ODS on a small scale. This proved to be costly, slow and impractical. Continued storage of ODS increases the prospect of significant emissions to the environment. In addition, the lack of cost-effective options for destruction undermines the value of the work by servicing companies that have made best-endeavours to recover the ODS and to prevent it being released.

8.12.6.8 Sub-Project Rating

UZB/98/G31 - National programme for recovery and recycling of ODS refrigerants (UNDP/UNOPS)		
Criterion	**Evaluator's Summary Comments**	**Evaluator's Rating**
Attainment of project objectives and results Sub criteria (in yellow below)	See comments below	S
Effectiveness	Good distribution of equipment and monitoring of ODS recovery. ODS recovered was 16% of target. There was no recycling due to equipment problems.	S
Relevance	Recovery and recycling equipment is consistent with minimising the detrimental impact of ODS on the ozone layer	S
Efficiency	A relatively small team in the NOU leveraged national resources to implement ODS recovery in a cost-effective and timely manner	S
Sustainability of Project outcomes (overall rating) Sub criteria (in yellow below)	See comments below	
Financial	Delivered within budget, but sustainability is non-existent, but sustainability is on a limited scale	S
Socio-Political	Good stakeholder ownership of equipment and participation in the project; sustainability limited	S

UZB/98/G31 - National programme for recovery and recycling of ODS refrigerants (UNDP/UNOPS)		
Criterion	**Evaluator's Summary Comments**	**Evaluator's Rating**
Institutional framework and governance	Further legislation required to promote ongoing use of the equipment	S
Environmental	Lack of spare parts and equipment malfunction reduces the prospects of sustainability	S
Achievement of outputs and activities		S
Monitoring and Evaluation (overall rating) Sub criteria (in yellow below)	See below	
M&E Design	Design limited to equipment delivery and number, with no consideration of qualitative performance indicators	MS
M&E Plan Implementation (use for adaptive management)	Inability to solve difficulties with spare parts reduced the impact of this project, and there were some implementation delays	MS
Budgeting and Funding for M&E activities	Came in under budget allowing expenditure on equipment that would help with sustainability	S
Catalytic Role	No rating requested	
Preparation and readiness	Legislation on ODS and extensive list of beneficiary companies	HS
Country commitment and motivation*	High level of country commitment, but specific legislation requiring training is missing which precludes sustainability of action to recover ODS	S
Stakeholders' involvement	High level of effective stakeholder involvement	HS
Financial planning	Executed within budget and disbursed in a reasonably timely manner	HS
UNDP supervision and support**	Consultant was well received and provided valuable, well-timed advice	HS
Overall Rating		S

Highly Satisfactory (HS); Satisfactory (S); Moderately Satisfactory (MS); Moderately Unsatisfactory (MU); Unsatisfactory (U); Highly Unsatisfactory (HU);
*Motivation replaced TOR '*driveness*'; **Support replaced TOR 'backshopping'

8.12.7 UZB/98/G32 Elimination of the use of CFCs in manufacturing of domestic refrigerators at Sino (UNDP/UNOPS)

8.12.7.1 Introduction

3649. SINO is the only producer of domestic refrigerator equipment in Uzbekistan, employing about

450 people including 250 technicians when it was working at full capacity. It is a government-owned factory which began operations in 1973. The company also produces deep freezers and air conditioners.

3650. This sub-project facilitated the production of refrigerators with compressors operating on HFC-134a rather than CFCs, and that contained foam that was blown with cyclopentane instead of CFCs. Cannon equipment was used for the foam production, and Galileo equipment for charging the circuit with HFC-134a. The equipment was delivered in December 2001, and the project completed on 2 June 2003.

8.12.7.2 Attainment of objectives and planned results

3651. This sub-project was approved by the GEF in November 1998 and commenced in December 1999[590]. The project aimed to transition the domestic refrigerator production line to CFC-free technology, to provide technical assistance and training in the operation of the new equipment, and to improve the design of refrigerators to make them more competitive on the national market. As a result of this transition, Uzbekistan would eliminate the annual import 35 ODP-tonnes of CFCs.

8.12.7.2.1 Effectiveness

3652. The sub-project successfully eliminated 35 ODP-tonnes of CFCs as new refrigerators operated with HFC-134a compressors and the insulation foam was blown with cyclopentane.

3653. Equipment that was rendered obsolete as a result of the transition was dismantled. Modifications were made to the factory that addressed new assembly line requirements for power, compressed air, water and nitrogen. Modifications were also made in the factory to accommodate the premixing and safe storage of cyclopentane, and new assembly lines were completed for the production of the doors and cabinets.

3654. The results were assessed as satisfactory because Uzbekistan achieved its goal of eliminating CFCs and CFC-dependent technology at the SINO domestic refrigerator production facility.

8.12.7.2.2 Relevance

3655. The reduction and phased out of ODS in Uzbekistan is consistent with the objectives of the Vienna Convention and the Montreal Protocol which *requires Parties to take appropriate measures in accordance with the provisions of this Convention and of those protocols in force to which they are party to protect human health and the environment against adverse effects resulting or likely to result from human activities which modify or are likely to modify the ozone layer*[591]. The elimination of ODS at the SINO refrigerator production facility was therefore consistent with the requirements of the Vienna Convention and the Montreal Protocol.

3656. The GEF established in 1995 an Ozone Layer Depletion Focal Area in response to the Montreal Protocol. The Focal Areas has the strategic objective of protecting human health and the environment by assisting countries to phase out their consumption and production of ODS, to prevent emissions of ODS, and to encourage the uptake of alternative technologies and practices according to countries' commitments under the Montreal Protocol. The GEF interventions contribute to the return of the ozone layer to pre-1980 ozone levels, which is expected by 2065. This strategic objective was achieved by the elimination of ODS at the SINO refrigerator production facility.

3657. Most recently, the dual capability of ODS to both reduce ozone and significantly impact on the climate have been described[592]. Global ODS consumption in 1989 was equivalent to about 9,200 million tonnes (9 Gt) CO_2-eq/year, which was reduced to about 1,870 million tonnes (1.8 Gt) CO_2-eq/year in 2007 as a result of ODS phase-out activities under the Montreal Protocol. This reduction of 7 Gt CO_2-eq/year was at least three times greater than the Kyoto Protocol's reduction target (about 1-2 Gt CO_2-eq/year in 2008-2012), demonstrating that the global ODS reductions achieved so far have already

590 The Project Document for the SINO project was not available on the UNDP GEF website http://www.gefonline.org/projectListSQL.cfm

591 Handbook for the Vienna Convention for the Protection of the Ozone Layer - 7th Edition (2006). Article 2: General Obligations.

592 Velders, J.M., Andersen, S.O., Daniel, J.S., Fahey, D.W. and M. McFarland. 2007. The Importance of the Montreal Protocol in protecting climate. http://www.pnas.org/content/104/12/4814.abstract

yielded a larger climate benefit than the current Kyoto Protocol target. A climate benefit was achieved by the elimination of ODS at the SINO refrigerator production facility.

3658. The actions taken by Uzbekistan to phase out the use of ODS at the SINO refrigerator production facility improved the protection of the ozone layer (Montreal Protocol) and reduced the impact of radiative forcing of the climate (Kyoto Protocol).

8.12.7.2.3 Efficiency

3659. Based on the elimination of goal of eliminating 35 ODP-tonnes of CFCs at a cost of $1,516,648 the cost-effectiveness is $43 / ODP-kg. However, in reality the quantity of CFCs needed to support the existing refrigerator production level was much less as the production was not about 120,000 per year as calculated by UNEP but only about 5,000 per year (Table 75). The cost-effectiveness of expenditure of $1,516,648 to produce about 5,000 refrigerators is $1011 / ODP-kg[593]. Compared with the cost-effectiveness in other projects, this is a very poor cost-effectiveness.

3660. The project implementation was delayed by 15 months overall, but this would have had little impact on the cost-effectiveness.

8.12.7.3 Assessment of Sustainability of project outcomes

8.12.7.3.1 Financial resources

3661. From December 1999 to June 2003, the GEF provided $1,516,648 to phase out 35 ODP-tonnes of CFC-12 used in the compressor and CFC-11 used in the foam. Co-finance was officially reported as $121,830 but estimated by SINO to be $3 to $3.5 million.

3662. It is regarded as a strategically-important state enterprise. However, the government is looking to reduce its 88.8% stake to about 33% given the financial performance of the company in the past 5 years.

Figure 53: Template unit for cutting out door lining (left), welding compressor circuit to compressor (right), and finished refrigerators (below). SINO, Uzbekistan.

8.12.7.3.2 Socio-political

3663. The company is an important local employer in the Samarkandt area with more than 400 employed in refrigerator production, and therefore the facility is strategically important. There is a risk that the facility would close with increasing competition for domestic sales of refrigerators on the local market, leading to a loss of GEF investment.

3664. The global economic crisis may not allow the government to financially support industries that require significant investment to improve market performance. The same crisis may cause the facility to close as a result of the uneconomic production of refrigerators.

8.12.7.3.3 Institutional framework and governance

3665. The NOU provided the necessary support to the Managers of SINO in order to progress implementation of the sub-project being undertaken at SINO. The NOU made 18 visits to the

[593] Assuming 300 g of CFCs per refrigerator

facility over the duration of the sub-project, which represented a considerable investment in time given that the factory is located 2-3 hours from the NOU's offices in Tashkent. The NOU opined that sub-project would have been much longer if their visits had not taken place

3666. Legislation in Uzbekistan banned the import of CFCs, which encouraged SINO to transition to CFC-free technology.

8.12.7.3.4 Environmental

3667. The conversion to HFC-134a in the compressor and cyclopentane in the insulation is irreversible. However, today 70% of the domestic refrigerators are manufactured with hydrocarbon in the compressor, which improves energy efficiency and attractiveness to the consumer. Hydrocarbon refrigerators are therefore more competitive on the market than HFC-134a refrigerators, and therefore there is a stronger export demand.

3668. It is possible that SINO will finance a second conversion to hydrocarbons in order to improve its marketing options. Hydrocarbon technology it not ozone depleting and has a very small global warming impact, unlike HFCs which are relatively powerful global warming agents. Therefore this second conversion would be environmentally favourable.

8.12.7.4 Catalytic role

3669. Catalytic action occurs when other similar companies would finance their own transition from ODS, having seen as an example the transition of the beneficiary. This is unlikely to happen since SINO there are no other domestic refrigeration companies manufacturing in Uzbekistan. There are also examples of technology conversions in other CEITs which would represent better examples for catalytic action than the SINO facility.

8.12.7.5 Achievement of outputs and activities

8.12.7.5.1 Delivered outputs

3670. Prior to 1990, just 5 models of refrigerators (Figure 53) were marketed. SINO supplied about 210,000 refrigerators per year to the Soviet Union until this market collapsed in the mid-1990s to just 28,000 refrigerators per year.

3671. After the project was completed, the number of refrigerators and models produced by SINO from 2003 to 2008 are shown in Table 75. This shows that the production was very low in all of the years compared to production in other CEITs. Moreover, in many cases each model had a production run of less than 30 refrigerators, which would be termed a test run by most production factories when developing a new model.

Table 75: The number of refrigerators and models produced from 2003 to 2008 by SINO

Year	No of refrigerators	Models	Production size per model
2003	2,513	14	10 models 30 units or less
2004	3,099	11	8 models 30 units or less
2005	723	20	12 models 30 units or less
2006	5,044	14	5 models 30 units or less
2007	10,774	18	8 models 30 units or less
2008	3,209*	13	10 models 30 units or less

* Half year results

3672. SINO said that they planned to increase the output to 50,000 refrigerators in 2010, and 200,000 - 250,000 by 2012, and to export at least half of them[594].

8.12.7.5.2 Awareness about ODS, ODS substitute technology, and strengthening of institutional capacities for dealing with ODS phase-out

3673. The management at SINO were well aware of the benefits to the ozone layer of avoiding the use of CFCs, and the technology that could substitute for them. They spent time evaluating different options from various manufacturers for the compressor gas (Galileo, Italy; Sikplant, Italy;

[594] Mr Ravshan Rahimov, director of Tashkent branch of Sino JSC. Exhibitor at Expo.Uz, 2008

Gramkov, Denmark; Prodakshen Control Unit, United States; RSP, Canada) and the insulation (Impianti OMS, Italy; Perros, Italy; Sicplant, Italy; Cannon, Italy; Hennecke, Germany; Krauss Maffie, Germany; Elastogan, Germany; Gusmer, United States).

3674. Within the NOU, the deputy head of the unit was himself a qualified refrigeration engineer, and therefore he was able to provide helpful advice at all stages of the transition.

3675. The government adopted legislation that supported the phase out of CFC equipment by banning the import of CFCs and CFC-dependent equipment. This was helpful to SINO as it provided a "level playing field" for its production of CFC-free equipment.

8.12.7.5.3 Authority / credibility, necessary to influence policy and decision-makers

3676. The NOU had the authority / credibility necessary to influence policy and decision-makers. The equipment for SINO and training in its use were a priority within Government and at the Ministry level (State Committee for Nature Protection).

3677. The NOU communicated with a range of organisations including the State Customs Committee (for the equipment import), UNOPS, UNDP, the Association "Uzmashsanoat", and the SINO management.

8.12.7.6 Assessment of Monitoring and Evaluation Systems

8.12.7.6.1 Monitoring and evaluation design

3678. The Monitoring and Evaluation design consisted of three phases: the preparatory stage, the installation work and the startup phase. There was a time in months allocated for each phase.

3679. The preparatory stage included project approval (Nov 1998) and signature (Dec 1999), tender for thermal insulation (Oct 1999), tender analysis (Nov 2000), selection of vendor (Nov 2000), and equipment purchase (Dec 2000). There was a similar process for the selection of the refrigerant equipment from Feb 2001 to Apr 2002. Cannon was selected for the insulation line, and Galileo for the compressor line.

3680. In the installation phase, the obsolete equipment was dismantled, new equipment was approved entry by Customs, and the new equipment was checked and installed. This included installation of the door filling lines, cyclopentane storage and safety approval, and mixing facilities.

3681. The startup phase included purchase of materials (compressors, thermostats, cable, generator for electrical backup, dryers), and chemicals (polyol, isocyanate, HFC-134a, cyclopentane, polystyrene). The newly-installed machines were tested by representatives from Cannon and Galileo, and the International Security Inspectorate certified the installations.

8.12.7.6.2 Monitoring and evaluation plan implementation

3682. Monitoring consisted of comparing planned versus actual implementation for each of the phases, and noting the delay that resulted. On one occasion, UNOPS wrote to the SINO management to complain of delays and to point out actions that had been taken by UNOPS to avoid further delays, but nevertheless the delays persisted.

3683. The NOU commented that they had undertaken 18 visits to SINO to assist with all stages of the sub-project. Assistance from UNDP at that time, in their capacity to ensure a smooth implementation of the project, was minimal. The NOU opined that sub-project would have been much longer if their visits had not taken place.

3684. The company was satisfied with the Cannon and Galileo equipment and the procedures that were used to select it[595]. SINO received local government authorisation without difficulty to use and store cyclopentane.

3685. The sub-project was about 15 months behind schedule when it was completed (Table 76).

[595] Foam-blowing choice was Impianti, Perros, Sicplant, Cannon, Hennecke, Krauss Maffie, Elastogan, Gusmer; Refrigerant charging unit choice was Galileo, Sikplant, Gramkov, Prodakshen Control Unit and RSP

Table 76: Comparison of planned versus actual for the phases of implementation of CFC-free technology at the SINO domestic refrigerator production facility in Uzbekistan

Phase*	Planned implementation, months	Actual implementation, months	Delay
Preparatory	6	24	-18
Installation	6	6	0
Start up	12	9	+3
TOTAL	24	39	-15

* See paragraphs 3679 to 3681 above for a description of the activities in each phase

8.12.7.6.3 Budgeting and Funding for monitoring and evaluation activities

3686. The assessment team was not able to locate the Project Document for this sub-project, and therefore it was not possible to determine the budget allocated for the monitoring and evaluation activities.

8.12.7.6.4 Long-term monitoring

Since the implementation of the CFC-free technology is irreversible, long term monitoring was neither considered appropriate nor planned.

8.12.7.7 Assessment of processes that affected attainment of project results

8.12.7.7.1 Preparation and readiness

3687. The conversion of domestic refrigerator production facilities to CFC-free technology had been undertaken on many occasions in different countries. This resulted in Implementing Agency and consultant experience in this area. The project management followed well-established UNDP/UNOPS guidelines, which accounted for the phases and the schedule.

3688. There was a range of equipment that was available from a number of manufacturers who were able to provide information related to the procurement.

3689. The NOU had on its staff an experienced refrigeration engineer who was able to provide expert advice to SINO. In addition, the government had adopted legislation that banned the import of CFCs and CFC-dependent equipment. The government also considered the conversion to CFC-free technology a high priority.

3690. Collectively these factors contributed to the preparation and readiness of SINO to convert the domestic refrigerator production facilities to CFC-free technology.

8.12.7.7.2 Country commitment and motivation

3691. The government of Uzbekistan demonstrated a high level of commitment to the project, as demonstrated by the large number of visits to the facility to solve problems that had arisen during the course of the sub-project and to facilitate progress.

8.12.7.7.3 Stakeholder involvement

3692. The project involved the relevant stakeholders for information sharing, consultation and participation and in doing so it made use of the skills, experience and knowledge of key national and international organisations and regional departments in Uzbekistan. The main stakeholders involved were the State Customs Committee (for the equipment import), UNOPS / UNDP, the Association “Uzmashsanoat”, the SINO management and the NOU.

8.12.7.7.4 Financial planning

3693. UNDP did not follow the MLF guidelines when formulating the SINO investment sub-project. If they had been followed, the grant would have been about $135,000 based on a production of about 4,000 refrigerators per year. Instead, UNDP calculated the funding level on the basis of 250,000 refrigerators per year, which resulted in funding to SINO of more than $1.5 million. The results showed that the refrigerator production since 2003 has averaged only 4,761 refrigerators per year.

3694. It appeared that level of financial support was in excess of that required because the process for

calculating the appropriate value of the funding level was fundamentally flawed. The GEF funds were therefore used as though the GEF were a joint-venture partner, rather than a funding body responsible for strategically phasing out a relatively small quantity of ODS used annually in this refrigerator production facility.

3695. The assessment team asked UNDP in Tashkent for their reasons for the much higher level of funding. UNDP reported that they did not have the financial expertise to undertake the viability test on the company, and that they saw their role as mainly acting as an intermediary in the financial transactions between SINO and UNOPS.

3696. The assessment team considered that the financial planning for the sub-project by UNDP-UNOPS was unprofessional and inadequate, particularly as it reduced the funding for other projects in other countries that could have benefitted from funding for ODS reduction and phase out.

8.12.7.7.5 UNEP / UNDP supervision and support

3697. According to the NOU, UNDP-UNOPS were not active in this project and did not provide any quality support to SINO. The NOU maintains that the project concluded in a reasonable timeframe due to their effort rather than the work of UNDP.

8.12.7.7.6 Co-financing and project outcomes & sustainability

3698. SINO commented that the GEF funds were essential for preventing the total collapse of the company. In the past it was reported to be a strategically-important state enterprise, but now the Government is looking to reduce its 88.8% stake to about 33%.

3699. SINO reported that there was a pressing need to install hydrocarbon technology (R600) for the compressor as this was demanded by all the export markets, but there was little capital within the company to finance the conversion given the low refrigerator production volume. SINO intended to install R-600 capacity in the production facility by raising capital from increased production, and through joint-venture partnerships with another company from Korea, China or Belarus.

3700. There appears to be a business agreement with Haier (China), but this was not made clear during the interview of the assessment team with SINO. The market size in Uzbekistan was estimated by SINO to be 250,000 refrigerators per year. SINO is reported to have been working to 5-10% of its capacity for many years[596].

8.12.7.7.7 Project implementation delays and impact on project outcomes & sustainability

3701. The main difficulties experienced by SINO during the project were the delay in signing the sub-project; the theft of the high pressure pipes; delays in local construction works; lack of project management personnel during key parts of the implementation phase, including changes in the chief executive[597]. The preparatory phase was delayed by 18 months, whereas installation was on time and start-up was three months ahead of schedule. Overall the sub-project took 15 months longer than planned to complete (see Table 76).

3702. In a fax to SINO dated 14 June 2002 and in recognition of SINO's poor financial situation that was affecting progress on the project, UNOPS offered to amend the contract to allow UNOPS rather than SINO to pay for parts and equipment in the facility that were needed prior to the installation of the Cannon equipment. UNOPS complained that SINO had not communicated when equipment had been purchased and the expected date for future purchases, which made scheduling of the transition to non-ODS technology difficult.

3703. These delays were assessed as not affecting the sustainability of SINO since the conversion to CFC-free technology is irreversible.

---

[596] The President of Uzbekistan Mr Islam Karimov. 15 April 2008

[597] The chief executive changed 5 times during the sub-project.

8.12.7.8 Sub-Project Rating

UZB/98/G32 – Elimination of the use of CFCs in manufacturing of domestic refrigerators at Sino (UNDP/UNOPS)		
Criterion	**Evaluator's Summary Comments**	**Evaluator's Rating**
Attainment of project objectives and results Sub criteria (in yellow below)	See comments below	S
Effectiveness	The facility was converted to CFC-free technology thereby avoiding further CFC consumption	S
Relevance	Conversion to non-ODS technology is consistent with minimising the detrimental effect of ODS on the ozone layer	HS
Efficiency	A relatively small team in the NOU leveraged national resources to coordinate the conversion to CFC-free technology in a cost-effective and timely manner	MS
Sustainability of Project outcomes (overall rating) Sub criteria (in yellow below)	See comments below	S
Financial	Delivered within budget, but the budget was very large for the refrigerator production	S
Socio-Political	SINO is a government priority as the facility important for local employment. The global economic crisis, together with the government's wish to reduce its share from 88% to 33%, uncompetitive product and low production volume could make long term manufacturing difficult	S
Institutional framework and governance	Strong management support by the NOU, and useful legislative measures	HS
Environmental	Conversion to CFC-free technology was irreversible	HS
Achievement of outputs and activities		S
Monitoring and Evaluation (overall rating) Sub criteria (in yellow below)	See below	
M&E Design	Project Document not available. SINO monitored the time to complete each phase of the project.	MS
M&E Plan Implementation (use for adaptive management)	There was little evidence of adaptive management	S

UZB/98/G32 – Elimination of the use of CFCs in manufacturing of domestic refrigerators at Sino (UNDP/UNOPS)		
Criterion	**Evaluator's Summary Comments**	**Evaluator's Rating**
Budgeting and Funding for M&E activities	Not determinable from the documentation provided	MS
Catalytic Role	No categorisation required	
Preparation and readiness	The stakeholders and management of SINO were reasonably well prepared	S
Country commitment and motivation*	Uzbekistan was highly committed to the conversion of the facility to CFC-free technology	HS
Stakeholders' involvement	The project involved the relevant stakeholders and made use of the skills, experience and knowledge of key national and international organisations	S
Financial planning	Inadequate, unprofessional and inconsistent with MLF guidelines	U
UNEP supervision and support**	UNDP/UNOPs was non-existent (U), and all the support was done by the NOU (HS)	S
Overall Rating		S

Highly Satisfactory (HS); Satisfactory (S); Moderately Satisfactory (MS); Moderately Unsatisfactory (MU); Unsatisfactory (U); Highly Unsatisfactory (HU);
*Motivation replaced TOR '*driveness*'; **Support replaced TOR 'backshopping'

Annex 1 Terms of Reference

EVALUATION OF GEF OZONE PORTFOLIO

GF/4040-01-07; GF/4040-02-05; GF/4040-01-13; GF/2110-99-16; GF/2110-99-02; GF/4040-00-23; GF/4040-02-03; GF/4040-00-21; GF/4040-01-14

These terms of reference were prepared to cover the terminal evaluations of the following projects/sub-projects:

TERMINAL EVALUATION

NOTE: **The consultants were separately recruited to conduct an impact evaluation on Ozone Depleting Substances for the GEF Evaluation Office, the consulting time to cover the evaluation of the UNDP components of these projects forms a part of that contractual arrangement. EOU have liaised with GEF EO to ensure there was no duplication of effort or duplication travel and per diem costs. Cost savings for the GEF resulted from this arrangement.**

1. **GEF 463 - Azerbaijan: Phasing out Ozone Depleting Substances (ODS**)

   Sub-projects:
   - 1.1 AZE/98/G31 - Conversion of compressor manufacturing facility in Sumgayit (UNDP/UNOPS);
   - 1.2 AZE/98/G32 - Elimination of CFCs in the manufacture of domestic refrigerators at Chinar (UNDP/UNOPS);
   - 1.3 AZE/98/G33 - Recovery and recycling of ODS refrigerants in the air-conditioning and refrigeration sector (UNDP/UNOPS);
   - 1.4 AZE/98/G34 – Halon management and banking national recovery/recycling centre (UNDP/UNOPS);
   - 1.5 GF/4040-02-04 – Training of trainers for use of ODS-free refrigerants (UNEP);
   - 1.6 GF/2110-99-03 - Institutional Strengthening and Capacity Building, – Establishment of an Ozone Office (UNEP);
   - 1.7 GF/2110-99-0* - Institutional Strengthening and Capacity Building, – Establishment of an Ozone Office (UNEP);

2. **GEF-768 – Estonia: Programme for Phasing Out Ozone Depleting Substances (ODS)**

Sub-projects:
- 2.1 GF/4040-02-05- Train the trainers for use of ODS-free refrigerants in maintenance and servicing (UNEP);
  (Index is n.a.) - National programme for recovery and recycling of ODS refrigerants (UNDP/UNOPS);
- 2.3 (Index is n.a.) – Regional halon management stockpile programme (UNDP/UNEP);
- 2.4 GF/4040-01-07 - Institutional Strengthening and Capacity Building Establishment of an Ozone Office (UNEP);

3. **GEF-769 - Kazakhstan, Programme for Phasing Out Ozone Depleting Substances (ODS)**

   Sub-projects:
   - 3.1 KAZ/00/G31 - National programme for recovery and recycling of ODS refrigerants (UNDP/UNOPS);

3.2 KAZ/00/G33 – Elimination of the use of CFCs at 14 manufacturers of rigid polyurethane foam enterprises (UNDP/UNOPS);
3.3 KAZ/00/G34 - Elimination of the use of CFCs at 25 manufacturers of flexible foam enterprises (UNDP/UNOPS);
3.4 KAZ/00/G35 – Replacement of CFC-113 in the cleaning of oxygen manufacturing equipment at Pavlodar (UNDP/UNOPS);
3.5 KAZ/00/G36 – National halon management scheme programme (UNDP/UNOS);
3.6 GF/4040-01-13 –Programme for Phasing Out ODS - Merged Institutional Strengthening and training of trainers for use of ODS-free refrigerants including training of custom officers (UNEP);
3.7 GF/2110-99-0* - Institutional Strengthening and Capacity Building, – Establishment of an Ozone Office (UNEP);

4. GEF-343-Latvia: Programme for Phasing Out Ozone Depleting Substances (ODS)

Sub-projects:

4.1 LAT/97/G31 - Sectoral phase-out of CFCs in aerosol industry (UNDP/UNOPS);
4.2 LAT/97/G33 – Phase out of the use of CFCs in the manufacture of rigid polyurethane foam at Ritols (UNDP/UNOPS);
4.3 LAT/97/G34 - National programme for recovery and recycling of ODS refrigerants (UNDP/UNOPS);
4.4 GF/2110-99-16 - Institutional Strengthening for the Implementation of the Montreal Protocol in Latvia (UNEP);

5 GEF-344-Lithuania: Programme for Phasing Out Ozone Depleting Substances (ODS)

Sub-projects:

5.1 LIT/97/G32 - National programme for recovery and recycling of ODS refrigerants (UNDP/UNOPS);
5.2 LIT/97/G33 – Phase out of the use of CFCs in the production of aerosols at Vilnius Buitine Chemija(UNDP/UNOPS);
5.3 LIT/97/G34 – Elimination of the use of CFCs in the manufacture of domestic refrigerators and freezers at Snaige(UNDP/UNOPS);
5.4 LIT/97/G35 – Conversion of the manufacturing facility at ARUVA to enable mass production of HFC-134a compressors (UNDP/UNOPS);
5.5 GF/2110-99-02 – Institutional Strengthening for the Implementation of the Montreal Protocol in Lithuania (UNEP);

6 GEF-15 Tajikistan: Programme for Phasing Out Ozone Depleting Substances (ODS)

Sub-projects:
6.1 TAJ/00/G35- - National programme for recovery and recycling of ODS refrigerants (UNDP/UNOPS);
6.2 TAJ/00G36 – Complete phase out of CFCs in manufacturing of domestic refrigerators at Pamir(UNDP/UNOPS);
6.3 GF/4040-00-23 – Institutional Strengthening and Capacity Building – Establishment of an Ozone Office (UNEP);
6.4 GF/4040-02-03- Training of trainers for use of ODS-free refrigerants, including training of custom officers (UNEP);
6.5 GF/2110-99-0* - Institutional Strengthening and Capacity Building, – Establishment of an Ozone Office (UNEP);

7 GEF-593 – Turkmenistan: Programme for Phasing Out Ozone Depleting Substances (ODS)

Sub-projects:

7.1 TUK/98/G35- - National programme for recovery and recycling of ODS refrigerants (UNDP/UNOPS);
7.2 GF/2110-99-07 – Institutional Strengthening for the Implementation of the Montreal Protocol in Turkmenistan(UNEP);
7.3 GF/4040-01-15- Training of trainers for use of ODS-free refrigerants, including training of custom officers (UNEP);

8 **GEF-594 - Uzbekistan, Phasing out Ozone Depleting Substances (ODS)**

Sub-projects:
8.1 UZB/98/G31 - National programme for recovery and recycling of ODS refrigerants (UNDP/UNOPS);
8.2 UZB/98/G32 –n Elimination of the use of CFCs in manufacturing of domestic refrigerators at Sino (UNDP/UNOPS);
8.3 GF/4040-00-21 – Uzbekistan, Institutional Strengthening and Capacity Building: Establishment of the Ozone Office (UNEP);
8.4 GF/4040-01-15- Training of trainers for use of ODS-free refrigerants, including training of custom officers (UNEP);
8.5 GF/2110-99-0* - Institutional Strengthening and Capacity Building, – Establishment of an Ozone Office (UNEP);

MID-TERM EVALUATION

9 **GEF-1226 – Armenia: Phasing out Ozone Depleting Substances (ODS)**

Sub-projects:
9.1 ARM/**/*** Phase out of CFCs in production of aerosols at Household Chemistry Plant in Erevan (UNDP/UNOPS);
9.2 ARM/**/*** National programme for recovery and recycling of ODS refrigerants (UNDP/UNOPS);
9.3 ARM/**/*** Raising awareness, incentive retrofit and replacement programme in the end-user refrigeration sector (UNDP/UNOPS);
9.4 ARM/**/*** Phase-out of CFCs in manufacture of commercial refrigeration equipment at Saga (UNDP/UNOPS);
9.5 ARM/**/*** Monitoring the implementation of the Refrigerant Management Plan (UNDP);
9.6 GF/4040-05-02– Institutional Strengthening and Capacity Building – Establishment of an Ozone Office and Training for Customs Officers and Refrigeration Technicians (UNEP);

1. PROJECT BACKGROUND AND OVERVIEW

Project rationale

The Montreal Protocol on Substances that Deplete the Ozone Layer came into force in January 1989 and 186 countries have ratified the Protocol as of March 2004. The Montreal Protocol sets a timetable for phasing-out of a number of Ozone Depleting Substances (ODS) and requires Parties to report on production and consumption of such ODS.

Among the Parties to the Montreal Protocol are also the Countries with Economies in Transition, some of which have re-classified to Article 5 countries. The Global Environment Facility is a financial mechanism, launched in 1991 and assists those countries, which are not eligible for funding from the Multilateral Fund, to fulfil their obligations under the Montreal Protocol

The recognition of the phenomenon of depletion of the stratospheric ozone layer, has led to a substantial international effort to phase out Ozone Depleting Substances (ODS). The emission of ODS into the earth's atmosphere causes damage to the stratospheric ozone layer which acts as a barrier to ultra-violet radiation from the Sun. Increased radiation has been traced as contributing to a higher incidence of skin cancer, eye diseases and immunological disorders while adversely affecting ecological food chains and bio-diversity. In the mid-1980s it was found that ozone depleting substances are responsible for the destruction of the ozone layer:

- Chlorofluorocarbons (CFCs): Used extensively in refrigeration and air-conditioning (as refrigerants), in foams (as blowing agents), in aerosols (as propellants), and also as solvents and cleaning agents.
- Halons: Used in fire-extinguishers and in fire fighting systems
- Methyl Bromide: Used as a fumigant

The basis of phasing out of the ozone depleting substances including CFCs, Halons, several halogenated solvents, agricultural fumigants such as Methyl Bromide and a class of transitional chemicals known as Hydrochlorofluorocarbons (HCFCs), is the Montreal Protocol (1987) ratified by all developed countries and most developing countries. Further recognition that ozone depletion is in fact occurring more rapidly than anticipated, has led to two amendments to the Montreal Protocol, which added controlled substances and accelerated phase-out schedules. The first amendment in June 1990 (London Amendment) added methyl chloroform (MCF) and carbon tetrachloride (CTC) and tightened the phase-out schedule. The second amendment in November 1992 (Copenhagen Amendment), added HCFCs and methyl bromide as controlled substances and further accelerated phase-out schedules. The third amendment in November 2007 accelerated the phase-out schedule of HCFCs for developed and developing countries.

The preparation of a Country Programme is generally the first step towards obtaining assistance from the Global Environment Facility and sets out the commitment by the government to take appropriate actions to ensure compliance with the Protocol. The Country Programme contains an analysis of the current situation with regard to the production and consumption of ODS in different industrial sectors, together with a strategy statement and plan of actions to be taken by the government. The approval of a Country Programme is a pre-condition for financial assistance from the Global Environment Facility for investment projects and Institutional Strengthening and Capacity Building projects.

UNEP's activities to protect the ozone layer have primarily been carried out in partnership with UNDP. They include the development of country programmes to phase out ozone depleting substances and activities to build country capacity to comply with the provisions of the Montreal Protocol including awareness raising, training, policy development and demonstration of the use of more benign alternatives to ozone depleting substances.

Providing financial support for institutional strengthening in CEIT countries is underscored by the following factors:

- There is a need to raise awareness of the phenomenon of ozone depletion and its potential impacts and the complexity of the fast changing nature of technical and scientific issues involved in protecting the ozone layer.
- There is a need to use ODS substitute technology.
- There is a need to strengthen institutional capacities in dealing with ODS phase out and technology transfer.
- There is a need to establish commitment by countries to earlier phase out schedules than that provided for under the Protocol (UNEP/OzL.Pro/ExCom/7/20)

In summary, the main objective of these projects was the rapid phase-out of ODS consistent with international efforts in this direction.

The projects had two components

- a technology conversion component (UNDP)
- a technical assistance and training component. (UNEP)

The technology conversion components of these projects comprised of sub-projects in the refrigeration and air-conditioning, foam blowing, solvent and aerosol sectors, and in the halon sector containing ODS phase-out targets, to be implemented by the UNDP.

The technical assistance components were implemented by UNEP and typically involve institutional strengthening, training for customs officials and refrigeration technicians.

The expected outcomes from these projects included:

1. Under the technology conversion component

- Conversion of manufacturing facilities consuming ODSs in their production processes to new non-ODS alternative technologies providing necessary equipment and now-how;

- Adoption of alternative technologies through technology transfer, technical assistance and in situ training of manpower;
- Introduction of ODS containment measures through ODS recovery and recycling, bank management and improvement of servicing practices;
- Phase-out of Ozone Depleting Substances by the various users specified in ODP tonnes according to targets specified in project documents;

2. Under the institutional strengthening sub-components:

- Enhanced capacity within the Ministry of Nature Protection through the National Ozone Unit (NOU);
- Suitable climate in the country for the expeditious phase-out of ODS;
- Facilitating the timely phase out of ODS consumption;
- Increased coordination between the various stakeholders;
- Improved data collection, analysis and dissemination of information on issues related to ozone layer protection;
- Established line of information exchange with other Parties as well as with the Ozone Secretariat and the Secretariat of the Multilateral Fund;
    - Established and improved reporting mechanism on national data on ODS consumption.

3. Under the customs training sub-components:

- Enforcement of licensing systems to enable compliance with the Montreal Protocol;
- Enhanced monitoring and control of ODS consumption in the country;
- Improved data reporting on ODS imports/exports system;
- Established line of information exchange between the National Ozone Unit and various levels of the Customs Department;
- Equipment purchased and distributed to the Customs officials (ODS identifiers);

4. Under the refrigeration training sub-components:

- Enhanced monitoring and control of ODS consumption in the country through drafting and implementation of good practices and certification codes for refrigeration technicians;
- Introduction of training modules in technical schools;
- Reduction in refrigerant emissions by introducing better practices in the servicing of refrigeration equipment.
- Equipment and tools purchased and distributed to the refrigeration technicians;

Relevance to GEF Programmes

Phasing out ozone depleting substances (ODS) is one of the goals of the Global Environment Facility (GEF). The GEF finances projects that phase out ozone depleting substances where these activities would be complementary to those funded under the Multilateral Fund of the Vienna Convention on the Protection of the Ozone Layer. So as not to duplicate those activities funded under the Multilateral Fund, GEF financing is targeted primarily to activities in Eastern Europe.

Executing Arrangements

In regard to UNEP projects, most of the activities enlisted in the projects were to be completed within 3 years. The National Ozone Unit within the relevant Ministry was responsible for the implementation of the project in accordance with the objectives and activities outlined in the project document. UNEP, as the GEF Implementing Agency, was responsible for overall project supervision to ensure consistency with GEF and UNEP policies and procedures, and provided guidance on linkages with related UNEP and GEF-funded activities. Older projects in the portfolio (prior to 2003) were designed with National cross-sectoral Steering Committees, chaired by the NOU, the latter bearing the responsibility for reporting back to UNEP/DGEF and DTIE. However, there was a change in project monitoring arrangements thereafter, such that UNEP/DGEF and UNEP/DTIE also monitored implementation of the activities undertaken during the execution of the project through direct participation in the Project Steering Committee. In addition to UNEP DGEF and UNEP DTIE monitoring, as aforementioned, the National Ozone Unit (NOU) had a major role in the process of monitoring of the project activities, specifically during the phase 2 of the non-investment activities. The UNEP/DGEF Co-ordination was responsible for clearance

and transmission of financial and progress reports to the Global Environment Facility. UNEP retains responsibility for review and approval of the substantive and technical reports produced in accordance with the schedule of work.

Prior to contracts, sub-contracts, or letters of agreement being entered into by the NOU, the NOU submitted to UNEP/DGEF Coordination copies of all these documents. Within ten working days, UNEP/DGEF Coordination would review, provide guidance and give NOU substantive clearance on the technical content of these contracts, sub-contracts and letters of agreement

The subprojects designated for UNEP were implemented from the UNEP-DTIE OzonAction branch in Paris, which has the mandate for information clearing house activities, training and policy setting under the Multilateral Fund of the Montreal Protocol.

UNDP's subprojects were executed by UNDP's Montreal Protocol Unit in close coordination with UNDP's GEF unit, and in conjunction with the United Nations Office for Project Services (UNOPS) with the help of their respective UNDP Country Offices, as is the case for most of its Multilateral Fund activities.

Project Activities

The following activities were listed under the three components as follows:

1. Institutional Strengthening:

1. A National Ozone Unit was established within the relevant ministries of each of the countries. The NOU consisted of a National Ozone Officer, an Assistant NOO, several national experts engaged on a short term basis for various activities such as ODS data collection, ODS legislation drafting, delivery of training workshops, etc. UNEP provided policy support for development of sustainable ODS Phase-out structures and mechanisms.
2. The NOU developed a workplan within the national ODS phase-out plan; The NOU was involved in the drafting of the ODS licensing legislation for ODS import/export control and in the establishment of quota system for ODS imports;

Further planned activities included:

- Establishment requirements on the labelling of ODS and ODS using equipment and products;
- Elaborating the system of ODS emission regulation, including changes/revisions;
- Public awareness campaigns: the NOU was to prepare and distribute leaflets and posters aimed at the public awareness on ozone issues; the NOU would co-ordinate the preparation and publication of articles in national and local newspapers dedicated to ozone issues; The NOU would also communicate with other mass media (TV and radio stations) on ozone related issues, organise public seminars on ozone issues; and organise and celebrate Ozone-day celebrations.
- The National Ozone Unit would collect the data on ODS consumption, import/export and to process and analyse the data;
- Collect data on recovered and recycled CFCs;
- Develop the national ODS phase-out schedule, including sector specific restrictions;
- Draft ODS licensing legislation for ODS import/export control, establish quota system for imports;
- Submit annual reports on ODS consumption to the Ozone Secretariat;
- Submit progress reports and expenditure reports on implementation of the Institutional Strengthening project (ISP).

2. Training for Customs Officials:

1. Under the Customs training component, a training workshop would take place under Phase 1 and Phase 2. UNEP DTIE was directly involved in the delivery of the Phase 1 Train-the-trainers workshop; while the Phase 2 workshops were co-ordinated locally by the National Ozone Unit with policy support by UNEP DTIE;
2. The National Ozone Unit was to procure equipment following UN equipment procurement procedures, and advised by UNEP DTIE.
3. Upon completion of the components, the NOU would prepare and submit to UNEP DTIE a workshop report.

3. Training for Refrigeration Technicians:

Under the Training for Refrigeration Technicians component the following activities were to be delivered:

1. Prepare and organise workshops under Phase 1 and 2 for refrigeration technicians in Good Practices in Refrigeration (GPR);
2. Organise bidding and procure equipment for the training workshops and training centres
3. Prepare and publish the workshop report

4. Investment Component.

UNDP has implemented 28 investment sub-projects in each country, which include aerosol, foam, solvent, refrigeration manufacturing and refrigerant and halon recovery/recycling projects (see the list of projects and sub-projects on Page 1). They usually entailed procurement of equipment, installation activities, on-the-job training, testing and trials, commissioning. However for the recovery-recycling, the purchasing of equipment was followed by training activities and distribution of the equipment to the servicing technicians.

Budgets

These vary by country and are specified in the relevant project documents. Project monies for IS and/or training projects range from about US$ 114,000 to US$ 1 million. GEF funding in investment sub-projects varies from US $40,000 to US $2.85 million. The total cost of the investment component in 10 CEIT countries amounts to about US $24million.

TERMS OF REFERENCE FOR THE EVALUATION

Objective and Scope of the Evaluation

The objective of this terminal evaluation is to determine the extent to which the project's objectives were achieved, or are expected to be achieved, and assess if the projects have led to any other positive or negative consequences. If possible the extent and magnitude of any project impacts to date will be documented and the likelihood of future impacts will be determined. The evaluation will also assess the performance of each project and the implementation of planned project activities and planned outputs against actual results.

Methods

This terminal evaluation will be conducted as an in-depth evaluation using a participatory approach whereby the UNEP/DGEF Task Manager, key representatives of the executing agencies (UNEP and UNDP) and other relevant staff are kept informed and regularly consulted throughout the evaluation. The consultant will liaise with the UNEP/EOU and the UNEP/DGEF Task Manager, as well with UNDP officers responsible for the implementation of specific sub-projects on any logistic and/or methodological issues to properly conduct the review in as independent a way as possible, given the circumstances and resources offered. The draft report will be circulated to UNEP/DGEF Task Manager, key representatives of the executing agencies and the UNEP/EOU. Any comments or responses to the draft report will be sent to UNEP / EOU for collation and the consultant will be advised of any necessary revisions.

The findings of the evaluation will be based on the following:

1. A desk review of project documents including, but not limited to:
   (a) The project documents, outputs, monitoring reports (such as progress and financial reports to UNEP, UNDP and GEF annual Project Implementation Review reports) and relevant correspondence.
   (b) Interview with international consultants involved in the implementation of projects and sub-projects;
   (c) Notes from the Steering Group meetings.
   (d) Other project related material produced by the project staff, international consultants or partners.
   (e) Relevant published material and the project information on an ftp site (to be provided by Task Manager)

2. The consultants will be expected to meet with the NOUs of each project country. The NOUs will organise for the relevant national execution partners and responsible officers in local UNDP offices to meet with the consultant during his mission to the country. UNEP and UNDP shall provide the consultants with the detailed contact information for the NOUs, and assist as necessary with instructing the NOUs to make other national executing partners available for interview. The consultant

shall keep careful note of all persons interviewed. (See Annex 6 in the Terms of Reference for the NOU contact information).

3. Interviews and Telephone interviews, as necessary, with intended users for the project outputs and other stakeholders involved with this project, including in the participating countries and international bodies. The Consultant shall determine whether to seek additional information and opinions from representatives of donor agencies and other organisations. As appropriate, these interviews could be combined with an email questionnaire.
4. Interviews with the UNEP/DTIE project task manager and Fund Management Officer, UNOPS and other relevant staff in UNEP / UNDP dealing with Ozone-related activities as necessary. The Consultant shall also gain broader perspectives from discussions with relevant GEF Secretariat staff.

Key Evaluation principles

In attempting to evaluate any outcomes and impacts that the project may have achieved, evaluators should remember that the project's performance should be assessed by considering the difference between the answers to two simple questions ***"what happened?***" and ***"what would have happened anyway?"***. These questions imply that there should be consideration of the baseline conditions and trends in relation to the intended project outcomes and impacts. In addition it implies that there should be plausible evidence to attribute such outcomes and impacts to the actions of the project.

Sometimes, adequate information on baseline conditions and trends is lacking. In such cases this should be clearly highlighted by the evaluator, along with any simplifying assumptions that were taken to enable the evaluator to make informed judgements about project performance.

1. <u>Project Evaluation Parameters</u>

A. Attainment of objectives and planned results:

The assessment of project results seeks to determine the extent to which the objectives of each project were achieved, or are expected to be achieved, and assess if the project has led to any other positive or negative consequences. While assessing a project's outcomes the evaluation will seek to determine the extent of achievement and shortcomings in reaching the project's objectives as stated in the project document and also indicate if there were any changes and whether those changes were approved. If the project did not establish a baseline (initial conditions), the evaluator should seek to estimate the baseline condition so that achievements and results can be properly established (or simplifying assumptions used). Since most GEF projects can be expected to achieve the anticipated outcomes by project closing, assessment of project outcomes should be a priority. Outcomes are the likely or achieved short-term and medium-term effects of an intervention's outputs. Examples of outcomes could include but are not restricted to stronger institutional capacities, higher public awareness (when leading to changes of behaviour), and transformed policy frameworks or markets. The evaluation should assess the extent to which the project's major relevant objectives were effectively and efficiently achieved or are expected to be achieved and their relevance.

- *Effectiveness*: Evaluate how, and to what extent, the stated project objectives have been met, taking into account the "achievement indicators" specified in the project document and logical framework[598]. In particular, the analysis of outcomes achieved should include, inter alia, an assessment of whether and to what extent the results of this project have:

    - ODS phase out achieved (ODP tonnes) and contribution of implemented projects to a country compliance with Montreal Protocol targets.

[598] In case in the original or modified expected outcomes are merely outputs/inputs then the evaluators should assess if there were any real outcomes of the project and if yes then whether these are commensurate with the realistic expectations from such projects.

- Availability of non-ODS-based product on the market resulted from conversion of manufacturing facilities to alternative technologies;
- Introduction of ODS containment practices resulted in reduction of ODS emissions.
- Raised awareness of the phenomenon of ozone depletion and its potential impacts and the complexity of the fast changing nature of technical and scientific issues involved in protecting the ozone layer.
- The increased use of ODS substitute technology.
- Strengthened institutional capacities in dealing with ODS phase out and technology transfer.
- Established country commitments to earlier phase-out schedules than that provided for under the Protocol (UNEP/OzL.Pro/ExCom/7/20)

- *Relevance:* In retrospect, were the project's outcomes consistent with the focal areas/operational program strategies and country priorities? The evaluation should also assess the whether or not outcomes specified in the project document and or logical framework are actually outcomes and not outputs or inputs. Ascertain the nature and significance of the contribution of the project outcomes to the wider portfolio of the GEF.
- *Efficiency:* Cost-effectiveness assesses the achievement of the environmental and developmental objectives as well as the project's outputs in relation to the inputs, costs, and implementing time. Include an assessment of outcomes in relation to inputs, costs, and implementation times based on the following questions: Was the project cost-effective? Was the project the least cost option? Was the project implementation delayed and if it was then did that affect cost-effectiveness? The evaluation should assess the contribution of cash and in-kind co-financing to project implementation and to what extent the project leveraged additional resources.

B. Assessment of Sustainability of project outcomes:

Sustainability is understood as the probability of continued long-term project-derived outcomes and impacts after the GEF project funding ends. The evaluation will identify and assess the key conditions or factors that are likely to contribute or undermine the persistence of benefits after the project ends. Some of these factors might be outcomes of the project, e.g. stronger institutional capacities or better informed decision-making. Other factors will include contextual circumstances or developments that are not outcomes of the project but that are relevant to the sustainability of outcomes. The evaluation should ascertain to what extent follow-up work has been initiated and how project outcomes will be sustained and enhanced over time.

Four aspects of sustainability should be addressed: financial, socio-political, institutional frameworks and governance, and ecological (if applicable). The following questions provide guidance on the assessment of these aspects:

- *Financial resources.* Are there any financial risks that may jeopardize sustenance of project outcomes? What is the likelihood that financial and economic resources will not be available once the GEF assistance ends (resources can be from multiple sources, such as the public and private sectors, income generating activities, and trends that may indicate that it is likely that in future there will be adequate financial resources for sustaining project's outcomes)? To what extent are the outcomes of the project dependent on continued financial support?
- *Socio-political:* Are there any social or political risks that may jeopardize sustenance of project outcomes? What is the risk that the level of stakeholder ownership will be insufficient to allow for the project outcomes/benefits to be sustained? Do the various key stakeholders see that it is in their interest that the project benefits continue to flow? Is there sufficient public / stakeholder awareness in support of the long term objectives of the project?
- *Institutional framework and governance.* To what extent is the sustenance of the outcomes of the project dependent on issues relating to institutional frameworks and governance? What is the likelihood that institutional and technical

achievements, legal frameworks, policies and governance structures and processes will allow for, the project outcomes/benefits to be sustained? While responding to these questions consider if the required systems for accountability and transparency and the required technical know-how are in place.

- *Environmental.* Are there any environmental risks that can undermine the future flow of project environmental benefits? The TE should assess whether certain activities in the project area will pose a threat to the sustainability of the project outcomes. For example; construction of dam in a protected area could inundate a sizable area and thereby neutralize the biodiversity-related gains made by the project; or, a newly established pulp mill might jeopardise the viability of nearby protected forest areas by increasing logging pressures; or vector control intervention may be made less effective by changes in climate and consequent alterations to the incidence and distribution of malarial mosquitoes.

As far as possible, also assess the potential longer-term impacts considering that the evaluation is taking place upon completion of the project and that longer term impact is expected to be seen in a few years time. Frame any recommendations to enhance future project impact in this context. Which will be the major 'channels' for longer term impact from the project at the national and international scales?

C. Catalytic role

The terminal evaluation will also describe any catalytic or replication effect of the project. What examples are there of replication and catalytic outcomes that suggest increased likelihood of sustainability? Replication approach, in the context of GEF projects, is defined as lessons and experiences coming out of the project that are replicated or scaled up in the design and implementation of other projects. Replication can have two aspects, replication proper (lessons and experiences are replicated in different geographic area) or scaling up (lessons and experiences are replicated within the same geographic area but funded by other sources). If no effects are identified, the evaluation will describe the catalytic or replication actions that the project carried out. No ratings are requested for the catalytic role.

D. Achievement of outputs and activities:

- Delivered outputs: Assessment of the project's success in producing each of the programmed outputs, both in quantity and quality as well as usefulness and timeliness.
- Assess the soundness and effectiveness of the approaches used for; raising awareness about ODS, promoting use of ODS substitute technology, and strengthening of institutional capacities for dealing with ODS phase-out.
- Assess to what extent the project outputs produced have the weight of scientific authority / credibility, necessary to influence policy and decision-makers, particularly at the national or regional levels.

E. Assessment of Monitoring and Evaluation Systems

- **M&E design.** Did the project have a sound M&E plan to monitor results and track progress towards achieving project objectives? The Terminal Evaluation will assess whether the project met the minimum requirements for project design of M&E and the application of the Project M&E plan (Minimum requirements are specified in Annex 4 in this Terms of Reference). The evaluation shall include an assessment of the quality, application and effectiveness of project monitoring and evaluation plans and tools, including an assessment of risk management based on the assumptions and risks identified in the project document. The M&E plan should include a baseline (including data, methodology, etc.), SMART (see Annex 4 in this Terms of Reference) indicators and data analysis systems, and evaluation studies at specific times to assess results. The time frame for various M&E activities and standards for outputs should have been specified.
- **M&E plan implementation.** Was an M&E system in place and did it facilitate tracking of results and progress towards projects objectives throughout the implementation period of each project. Were Annual project reports complete, accurate and with well justified ratings? Was the information provided by the M&E system used during the project to

- **Budgeting and Funding for M&E activities.** Were adequate budget provisions made for M&E made and were such resources made available in a timely fashion during implementation?
- **Long-term Monitoring.** Is long-term monitoring envisaged as an outcome of the project? If so, comment specifically on the relevance of such monitoring systems to sustaining project outcomes and how the monitoring effort will be sustained.

F. Assessment of processes that affected attainment of project results

The evaluation will consider, but need not be limited to, consideration of the following issues that may have affected project implementation and attainment of project results:

i. **Preparation and readiness.** Were the project's objectives and components clear, practicable and feasible within its timeframe? Were capacities of the executing institutions and counterparts properly considered when the project was designed? Were lessons from other relevant projects properly incorporated in design? Were the partnership arrangements properly identified and the roles and responsibilities negotiated prior to implementation? Was availability of counterpart resources (funding, staff, and facilities), passage of enabling legislation, and adequate project management arrangements in place at project entry?
   - Ascertain to what extent the project implementation mechanisms outlined in the project document have been closely followed. In particular, assess the role of the various committees established and whether the project document was clear and realistic to enable effective and efficient implementation, whether the project was executed according to the plan and how well the management was able to adapt to changes during the life of the project to enable the implementation of the project.
   - Evaluate the effectiveness and efficiency and adaptability of project management and the supervision of project activities / project execution arrangements at all levels (1) policy decisions: Steering Group; (2) day to day project management; (3) GEF guidance: UNEP DGEF / DTIE (UNDP, UNOPS)

ii. **Country ownership/Drivenness.** This is the relevance of the project to national development and environmental agendas, recipient country commitment, and regional and international agreements. Examples of possible evaluative questions include: Was the project design in-line with the national sectoral and development priorities and plans? Are project outcomes contributing to national development priorities and plans? Were the relevant country representatives, from government and civil society, involved in the project? Did the recipient government maintain its financial commitment to the project? Have the government approved policies or regulatory frameworks been in-line with the project's objectives? Specifically the evaluation will:
   - Assess the level of country ownership, and whether the project was effective in providing and communicating information, training and tools that assisted governments in eliminating or decreasing the prevalence of ozone depleting substances.
   - Assess the level of country commitment towards initiatives aimed at deceasing the use of ODS.

iii. **Stakeholder involvement.** Did the project involve the relevant stakeholders through information sharing, consultation and by seeking their participation in project's design, implementation, and monitoring and evaluation? For example, did the project implement appropriate outreach and public awareness campaigns? Did the project consult and make use of the skills, experience and knowledge of the appropriate government entities, NGOs, community groups, private sector, local governments and academic institutions in the design, implementation and evaluation of project activities? Were perspectives of those that would be affected by decisions, those that could affect the outcomes and those that could contribute information or other resources to the process taken into account while taking decisions? Were the relevant

vulnerable groups and the powerful, the supporters and the opponents, of the processes properly involved? Specifically the evaluation will:

- Assess the mechanisms put in place by the project for identification and engagement of stakeholders in each participating country and establish, in consultation with the stakeholders, whether this mechanism was successful, and identify its strengths and weaknesses.
- Assess the degree and effectiveness of collaboration/interactions between the various project partners and institutions during the course of implementation of the project.
- Assess the degree and effectiveness of any various public awareness activities that were undertaken during the course of implementation of the project.

iv. **Financial planning.** Did the project have the appropriate financial controls, including reporting and planning, that allowed management to make informed decisions regarding the budget and allowed for timely flow of funds. Specifically, the evaluation should:

- Assess the strength and utility of financial controls, including reporting, and planning to allow the project management to make informed decisions regarding the budget and allow for a proper and timely flow of funds for the payment of satisfactory project deliverables throughout the project's lifetime.
- Present the major findings from the financial audit if one has been conducted.
- Did promised co-financing materialize? Identify and verify the sources of co-financing as well as leveraged and associated financing (in co-operation with the IA and EA).
- Assess whether the project has applied appropriate standards of due diligence in the management of funds and financial audits.
- The evaluation should also include a breakdown of final actual project costs by activities compared to budget (variances), financial management (including disbursement issues), and estimates of contributions in-kind where possible. This information will be prepared by the relevant staff of the project for scrutiny by the evaluator[599]

v. **UNEP / UNDP Supervision and backstopping.** Did UNEP/UNDP Agency staff identify problems in a timely fashion and accurately estimate its seriousness? Did UNEP/UNDP staff provide quality support and advice to the project, approved modifications in time and restructure the project when needed? Did UNEPUNDP and Executing Agencies provide the right staffing levels, continuity, skill mix, frequency of field visits?

vi. **Co-financing and Project Outcomes & Sustainability.** If there was a difference in the level of expected co-financing and actual co-financing, then what were the reasons for this? Did the extent of materialization of co-financing affect the project's outcomes and/or sustainability, and if it did affect outcomes and sustainability then in what ways and through what causal linkages?

vii. **Delays and Project Outcomes & Sustainability.** If there were delays in project implementation and completion, the evaluation will summarise the reasons for them. Did delays affect the project's outcomes and/or sustainability, and if so in what ways and through what causal linkages?

The ***ratings for each project will be presented in the form of a table*** with each of the categories rated separately and with **brief justifications for the rating** based on the findings of the main analysis. An overall rating for each project should also be given. The rating system to be applied is specified in Annex 1 to this Terms of Reference.

2. Evaluation report format and review procedures

[599] It should be noted that none of the projects of the ozone portfolio required co-finance. This in line with the GEF policy of following the guidelines of the multilateral fund.

The report should be brief, to the point and easy to understand. It must explain; the purpose of the evaluation, exactly what was evaluated and the methods used. The report must highlight any methodological limitations, identify key concerns and present evidence-based findings, consequent conclusions, recommendations and lessons. The report should provide information on when the evaluation took place, the places visited, who was involved and be presented in a way that makes the information accessible and comprehensible. The report should include an executive summary that encapsulates the essence of the information contained in the report to facilitate dissemination and distillation of lessons.

For each country, the report should contain a section that relates to the work completed by UNEP, and a separate section for UNDP work. Ratings for each of the agency components will be prepared and an overall rating for each GEF country intervention.

Evidence, findings, conclusions and recommendations should be presented in a complete and balanced manner. The evaluation report shall be written in English, be of no more than 50 pages (excluding annexes), use numbered paragraphs and include:

i) An **executive summary** or **Synthesis Report** providing a brief overview of the main conclusions and recommendations of the evaluation. It should contain horizontal trends that can be seen in the phase out of ODS in countries, any evidence of patterns of ODS elimination and common themes in experiences, for example;

ii) **Introduction and background** giving a brief overview of the evaluated project, for example, the objective and status of activities;

iii) **Scope, objective and methods** presenting the evaluation's purpose, the evaluation criteria used and questions to be addressed;

iv) **Project Performance and Impact** providing factual evidence relevant to the questions asked by the evaluator and interpretations of such evidence. This is the main substantive section of the report and should provide a commentary on all evaluation aspects (A – F above).

v) **Conclusions and rating** of project implementation success giving the evaluator's concluding assessments and ratings of the project against given evaluation criteria and standards of performance. The conclusions should provide answers to questions about whether the project is considered good or bad, and whether the results are considered positive or negative;

vi) **Lessons learned** presenting general conclusions, based on established good practices that have the potential for wider application and use. Lessons may also be derived from problems and mistakes. The context in which lessons may be applied should be clearly specified, and lessons should always state or imply some prescriptive action. A lesson should be written such that experiences derived from the project could be applied in other projects or at portfolio level;

vii) **Recommendations** suggesting *actionable* proposals regarding improvements of the current project. They may cover, for example, resource allocation, financing, planning, implementation, and monitoring and evaluation. Recommendations should always be specific in terms of who would do what, provide a timeframe, and a measurable performance target. In general, Terminal Evaluations are likely to have very few (only two or three) actionable recommendations;

viii) **Annexes** include Terms of Reference, list of interviewees, documents reviewed, brief summary of the expertise of the evaluator / evaluation team, a summary of co-finance information etc.. Dissident views or management responses to the evaluation findings may later be appended in an annex.

Examples of UNEP GEF Terminal Evaluation Reports are available at www.unep.org/eou

Review of the Draft Evaluation Report

Draft reports submitted to UNEP EOU are shared with the corresponding Programme or Project Officer and his or her supervisor for initial review and consultation. The DGEF staff and senior Executing Agency staff are allowed to comment on the draft evaluation report. They may provide feedback on any errors of fact and may highlight the significance of such errors in any

conclusions. The consultation also seeks agreement on the findings and recommendations. UNEP EOU collates the review comments and provides them to the evaluators for their consideration in preparing the final version of the report.

All UNEP GEF Evaluation Reports are subject to quality assessments by UNEP EOU. These incorporate GEF Office of Evaluation quality assessment criteria and are used as a tool for providing structured feedback to the evaluator (see Annex 3 in this Terms of Reference).

3. Submission of Final Terminal Evaluation Reports.

The final report shall be submitted in electronic form in MS Word format and should be sent to the following persons:

Segbedzi Norgbey, Chief,
UNEP Evaluation and Oversight Unit
P.O. Box 30552-00100
Nairobi, Kenya
Tel.: (254-20) 7624181
Fax: (254-20) 7623158
Email: segbedzi.norgbey@unep.org

With a copy to:

Maryam Niamir-Fuller
Director
UNEP/Division of GEF Coordination
P.O. Box 30552-00100
Nairobi, Kenya
Tel: + 254-20-7624165
Fax: + 254-20-624041/4042
Email: Maryam.Niamir-Fuller@unep.org

Christine Wellington-Moore
Task Manager (Ozone/POPs)
UNEP DGEF/RONA
UNEP Regional Office for North America
900 17th Street, NW, Suite 506
Washington, D.C. 20006
Telephone: 1 (202) 785 0465
Email: cw@rona.unep.org

Matthias Kern
UNEP/GEF POPs/Ozone SPO
United Nations Environment Programme (UNEP)
Division of GEF Coordination (DGEF)
PO Box 30552-00100
Nairobi, Kenya
Tel: 254 20 7624088
Fax: 254 20 7624041/2
Email: Matthias.Kern@unep.org

Dr. Suely Carvalho
Chief and Principal Technical Advisor
Montreal Protocol – Chemicals Unit
Energy and Environment Group
Bureau for Development Policy
UNDP
304, East 45th Street, FF-970

New York, New York
10017 U.S.A.
Tel: +1 212 906 66 87
Fax: +1 212 906 69 47
Email: suely.carvalho@undp.org

Mr. Jacques Van Engel
Programme Specialist
Montreal Protocol – Chemicals Unit
Energy and Environment Group
Bureau for Development Policy
UNDP
304, East 45th Street, FF-972
New York, New York
10017
U.S.A.
Tel: +1 212 906 57 82
Fax: +1 212 906 69 47
Email: jacques.van.engel@undp.org

The final evaluation report will be printed in hard copy and published on the Evaluation and Oversight Unit's web-site www.unep.org/eou. Subsequently, the report will be sent to the GEF Office of Evaluation for their review, appraisal and inclusion on the GEF website. In addition the final Evaluation report will disseminated to: The relevant GEF Focal points, Relevant Government representatives, UNEP DGEF Professional Staff, The project's Executing Agency and Technical Staff. The full list of intended recipients is attached in Annex 5 in this Terms of Reference.

4. Resources and schedule of the evaluation

This final evaluation will be undertaken by an evaluation team of a lead evaluator and two supporting evaluators. The principal evaluator is responsible for coordinating the work of the evaluation team, leading the review of the global outputs and preparing the final evaluation report covering the Terms of Reference. The supporting evaluators are each responsible for preparing in-depth evaluations of the regional and sectoral assessments.

The contract for the lead evaluator will begin on 22 December 2008 and end on 30 June 2009, 99 working days (3 months 2 weeks) spread over 27 weeks (7 months). The contract for the supporting evaluator will also begin on 22 December 2008 and end on 30 June 2009 and will include 50 days (1 month 3 weeks) spread over 27 weeks (7 months).

The lead evaluator will submit a draft report to EOU no later than 15 May 2009. EOU will provide copies to the UNEP/GEF Task Manager and the Project Director for initial comments. Comments to the draft report will be sent via EOU to the consultants by 31 May 2009 the lead consultant will submit the final report no later than 30 June 2009.

In accordance with UNEP/GEF policy, all GEF projects are evaluated by independent evaluators contracted as consultants by the EOU. The evaluators should have the following qualifications and undertake the duties and travel described:

Lead evaluator:

The principal evaluator should not have been associated with the design and implementation of the project. The evaluator will work under the overall supervision of the Chief, Evaluation and Oversight Unit, UNEP. The evaluator should be an international expert in Ozone issues and the Montreal Protocol, with a specific understanding of the complexities of methyl bromide replacement in post and pre-harvest sectors, as well as the relevant policy within the European Union, to which project countries have acceded. The consultant should also have the following minimum qualifications: The evaluator should be an international expert in Ozone issues and the Montreal Protocol, with a specific understanding of the complexities of ODS phase out and licensing systems, as well as the relevant policy within the European Union, to which some project countries

have acceded. The consultant should also have the following minimum qualifications: (i) experience with management and implementation of projects and in particular those related to refrigeration, foam, aerosols, halon and customs training; (ii) experience with project evaluation. Knowledge of UNEP / UNDP programmes and GEF activities is desirable. The lead evaluator will be responsible for the overall preparation, quality and delivery of the evaluation report.

First supporting evaluator:
The supporting evaluators will, under the supervision of the Lead Evaluator, assist in conducting evaluations of the regional and sectoral assessments. They should not have been associated with the design and implementation of the project. The evaluator should have the following minimum qualifications: The evaluator should be an international expert in Ozone issues and the Montreal Protocol, with a specific understanding of the complexities of ODS phase out and licensing systems, as well as the relevant policy within the European Union, to which some project countries have acceded. The consultant should also have the following minimum qualifications: (i) experience with management and implementation of projects and in particular those related to refrigeration, foam, aerosols, halon and customs training; (ii) experience with project evaluation. Knowledge of UNEP / UNDP programmes and GEF activities is desirable. Fluency in oral and written English is a must. The supporting evaluators will work under the supervision of the lead evaluator, with the division of labour agreed among the team.

5. Schedule Of Payment

Lump-Sum Option

The evaluator will receive an initial payment of 30% of the total amount due upon signature of the contract. A further 30% will be paid upon submission of the draft report. A final payment of 40% will be made upon satisfactory completion of work. The fee is payable under the individual Special Service Agreement (SSA) of the evaluator and IS **inclusive** of all expenses such as travel, accommodation and incidental expenses.

In case, the evaluator cannot provide the products in accordance with the TORs, the timeframe agreed, or his products are substandard, the payment to the evaluator could be withheld, until such a time the products are modified to meet UNEP's standard. In case the evaluator fails to submit a satisfactory final product to UNEP, the product prepared by the evaluator may not constitute the evaluation report.

Annex 1. PROJECT RATINGS TABLE

Criterion	Evaluator's Summary Comments	Evaluator's Rating
Attainment of project objectives and results (overall rating) **Sub criteria (below)**		
Effectiveness		
Relevance		
Efficiency		
Sustainability of Project outcomes (overall rating) **Sub criteria (below)**		
Financial		
Socio Political		
Institutional framework and governance		
Environmental		
Achievement of outputs and activities		
Monitoring and Evaluation (overall rating) **Sub criteria (below)**		
M&E Design		

Criterion	Evaluator's Summary Comments	Evaluator's Rating
M&E Plan Implementation (use for adaptive management)		
Budgeting and Funding for M&E activities		
Catalytic Role		
Preparation and readiness		
Country ownership / driveness		
Stakeholders involvement		
Financial planning		
UNEP Supervision and backstopping		
Overall Rating		

RATING OF PROJECT OBJECTIVES AND RESULTS

Highly Satisfactory (HS): The project had no shortcomings in the achievement of its objectives, in terms of relevance, effectiveness or efficiency.

Satisfactory (S): The project had minor shortcomings in the achievement of its objectives, in terms of relevance, effectiveness or efficiency.

Moderately Satisfactory (MS): The project had moderate shortcomings in the achievement of its objectives, in terms of relevance, effectiveness or efficiency.

Moderately Unsatisfactory (MU): The project had significant shortcomings in the achievement of its objectives, in terms of relevance, effectiveness or efficiency.

Unsatisfactory (U) The project had major shortcomings in the achievement of its objectives, in terms of relevance, effectiveness or efficiency.

Highly Unsatisfactory (HU): The project had severe shortcomings in the achievement of its objectives, in terms of relevance, effectiveness or efficiency.

Please note: Relevance and effectiveness will be considered as critical criteria. The overall rating of the project for achievement of objectives and results **may not be higher** than the lowest rating on either of these two criteria. Thus, to have an overall satisfactory rating for outcomes a project must have at least satisfactory ratings on both relevance and effectiveness.

RATINGS ON SUSTAINABILITY

A. Sustainability will be understood as the probability of continued long-term outcomes and impacts after the GEF project funding ends. The Terminal evaluation will identify and assess the key conditions or factors that are likely to contribute or undermine the persistence of benefits after the project ends. Some of these factors might be outcomes of the project, i.e. stronger institutional capacities, legal frameworks, socio-economic incentives /or public awareness. Other factors will include contextual circumstances or developments that are not outcomes of the project but that are relevant to the sustainability of outcomes..

<u>Rating system for sustainability sub-criteria</u>

On each of the dimensions of sustainability of the project outcomes will be rated as follows.

Likely (L): There are no risks affecting this dimension of sustainability.

Moderately Likely (ML). There are moderate risks that affect this dimension of sustainability.

Moderately Unlikely (MU): There are significant risks that affect this dimension of sustainability

Unlikely (U): There are severe risks that affect this dimension of sustainability.

All the risk dimensions of sustainability are critical. Therefore, overall rating for sustainability will not be higher than the rating of the dimension with lowest ratings. For example, if a project has an Unlikely rating in either of the dimensions then its overall rating cannot be higher than Unlikely, regardless of whether higher ratings in other dimensions of sustainability produce a higher average.

RATINGS OF PROJECT M&E

Monitoring is a continuing function that uses systematic collection of data on specified indicators to provide management and the main stakeholders of an ongoing project with indications of the extent of progress and achievement of objectives and progress in the use of allocated funds. Evaluation is the systematic and objective assessment of an on-going or completed project, its design, implementation and results. Project evaluation may involve the definition of appropriate standards, the examination of performance against those standards, and an assessment of actual and expected results.

The Project monitoring and evaluation system will be rated on 'M&E Design', 'M&E Plan Implementation' and 'Budgeting and Funding for M&E activities' as follows:

Highly Satisfactory (HS): There were no shortcomings in the project M&E system.

Satisfactory(S): There were minor shortcomings in the project M&E system.

Moderately Satisfactory (MS): There were moderate shortcomings in the project M&E system.

Moderately Unsatisfactory (MU): There were significant shortcomings in the project M&E system.

Unsatisfactory (U): There were major shortcomings in the project M&E system.

Highly Unsatisfactory (HU): The Project had no M&E system.

"M&E plan implementation" will be considered a critical parameter for the overall assessment of the M&E system. The overall rating for the M&E systems will not be higher than the rating on "M&E plan implementation."

All other ratings will be on the GEF six point scale.

GEF Performance Description
HS = Highly Satisfactory
S = Satisfactory
MS = Moderately Satisfactory
MU = Moderately Unsatisfactory
U = Unsatisfactory
HU = Highly Unsatisfactory

Annex 2

Review of the Draft Report

Draft reports submitted to UNEP EOU are shared with the corresponding Programme or Project Officer and his or her supervisor for initial review and consultation. The DGEF staff and senior Executing Agency staff provide comments on the draft evaluation report. They may provide feedback on any errors of fact and may highlight the significance of such errors in any conclusions. The consultation also seeks agreement on the findings and recommendations. UNEP EOU collates the review comments and

provides them to the evaluators for their consideration in preparing the final version of the report. General comments on the draft report with respect to compliance with these TOR are shared with the reviewer.

Quality Assessment of the Evaluation Report

All UNEP GEF Mid Term Reports are subject to quality assessments by UNEP EOU. These apply GEF Office of Evaluation quality assessment and are used as a tool for providing structured feedback to the evaluator.

The quality of the draft evaluation report is assessed and rated against the following criteria:

GEF Report Quality Criteria	**UNEP EOU Assessment**	**Rating**
A. Did the report present an assessment of relevant outcomes and achievement of project objectives in the context of the focal area program indicators if applicable?		
B. Was the report consistent and the evidence complete and convincing and were the ratings substantiated when used?		
C. Did the report present a sound assessment of sustainability of outcomes?		
D. Were the lessons and recommendations supported by the evidence presented?		
E. Did the report include the actual project costs (total and per activity) and actual co-financing used?		
F. Did the report include an assessment of the quality of the project M&E system and its use for project management?		
UNEP EOU additional Report Quality Criteria	**UNEP EOU Assessment**	**Rating**
G. Quality of the lessons: Were lessons readily applicable in other contexts? Did they suggest prescriptive action?		
H. Quality of the recommendations: Did recommendations specify the actions necessary to correct existing conditions or improve operations ('who?' 'what?' 'where?' 'when?)'. Can they be implemented? Did the recommendations specify a goal and an associated performance indicator?		
I. Was the report well written? (clear English language and grammar)		
J. Did the report structure follow EOU guidelines, were all requested Annexes included?		
K. Were all evaluation aspects specified in the TORs adequately addressed?		
L. Was the report delivered in a timely manner		

GEF Quality of the MTE report = 0.3*(A + B) + 0.1*(C+D+E+F)
EOU assessment of MTE report = 0.3*(G + H) + 0.1*(I+J+K+L)
Combined quality Rating = (2* 'GEF EO' rating + EOU rating)/3
The Totals are rounded and converted to the scale of HS to HU

Rating system for quality of terminal evaluation reports
A number rating 1-6 is used for each criterion: Highly Satisfactory = 6, Satisfactory = 5, Moderately Satisfactory = 4, Moderately Unsatisfactory = 3, Unsatisfactory = 2, Highly Unsatisfactory = 1, and unable to assess = 0.

Annex 3 GEF Minimum requirements for M&E

- Minimum Requirement 1: Project Design of M&E[600]
- All projects must include a concrete and fully budgeted monitoring and evaluation plan by the time of Work Program entry (full-sized projects) or CEO approval (medium-sized projects). This plan must contain at a minimum:
- SMART (see below) indicators for project implementation, or, if no indicators are identified, an alternative plan for monitoring that will deliver reliable and valid information to management
- SMART indicators for results (outcomes and, if applicable, impacts), and, where appropriate, corporate-level indicators
- A project baseline, with:
- a description of the problem to address
- indicator data
- or, if major baseline indicators are not identified, an alternative plan for addressing this within one year of implementation
- An M&E Plan with identification of reviews and evaluations which will be undertaken, such as mid-term reviews or evaluations of activities
- An organizational setup and budgets for monitoring and evaluation.

Minimum Requirement 2: Application of Project M&E

- Project monitoring and supervision will include implementation of the M&E plan, comprising:
- Use of SMART indicators for implementation (or provision of a reasonable explanation if not used)
- Use of SMART indicators for results (or provision of a reasonable explanation if not used)
- Fully established baseline for the project and data compiled to review progress
- Evaluations are undertaken as planned
- Operational organizational setup for M&E and budgets spent as planned.

SMART INDICATORS GEF projects and programs should monitor using relevant performance indicators. The monitoring system should be "SMART":

1. **Specific**: The system captures the essence of the desired result by clearly and directly relating to achieving an objective, and only that objective.
2. **Measurable:** The monitoring system and its indicators are unambiguously specified so that all parties agree on what the system covers and there are practical ways to measure the indicators and results.
3. **Achievable and Attributable:** The system identifies what changes are anticipated as a result of the intervention and whether the result(s) are realistic. Attribution requires that changes in the targeted developmental issue can be linked to the intervention.
4. **Relevant and Realistic:** The system establishes levels of performance that are likely to be achieved in a practical manner, and that reflect the expectations of stakeholders.

[600] http://gefweb.org/MonitoringandEvaluation/MEPoliciesProcedures/MEPTools/meptstandards.html

5. **Time-bound, Timely, Trackable, and Targeted:** The system allows progress to be tracked in a cost-effective manner at desired frequency for a set period, with clear identification of the particular stakeholder group to be impacted by the project or program.

ANNEX 5 : NOU Contacts in Project Countries

ARMENIA

NOU:
Ms. Asya Muradyan
Head of Land and Atmosphere Protection Division
Department of Environmental Protection
Ministry of Nature Protection
Government Building 3 Republic Square
375010 Yerevan
Armenia
Tel.: (37410)541183
Fax: (37410)541182
Email: asya.muradyan@undp.org

Dr. Aram Gabrielian
Head, Department of Atmosphere Protection
Department of Natural Resources and Environmental Protection
35, Moskovian St.
37502 Yerevan
Armenia
Tel: (3742) 53 49 82 / 15 19 59
Fax: (3742) 15 18 40 / 15 19 59
Email: root@nature.arminco.com

AZERBAIJAN

Mr. Maharram Mehtiyev
Director
Center for climate Change and Ozone
Ministry of Ecology and Natural Resources
AZ1073
Baku
Azerbaijan Republic
Tel: (99-412) 98 27 95
Fax: (99-412) 92 59 07
Email: aliyev@iglim.baku.az or
Email: climo@online.az

Mr Fuad Akhunzade
Deputy Chief, Department of Science and Environmental Protection
State Committee for Environment
31, Istiglaliyat Str.
Baku-370001
Azerbaijan
Tel: (99-412) 92 59 81
Fax: (99-412) 92 65 25
Email: root@eco.dl.ab.az

ESTONIA

Mrs. Valentina Lauis
Senior Officer
Environmental Management and Technology Department
Ministry of the Environment
24 Toompuiestee
15172 Tallinn
Estonia
Tel: (372) 6273 059
Fax: (372) 6604 522
Email: valentine.laius@ekm.envir.ee

KAZAKHSTAN

Ms Valentina Kryukova
National Ozone Officer
Climate Change Coordination Centre
Seifullina 597
Almaty
48 Abai st Room 102
Astana 473000
The Republic of Kazakstan
Tel (7 3172) 117169 / 70 / 73/ 318195
Fax (7 3172) 324 738/322696
Email: vkryukova@network.kz

LATVIA

Mr. Armands Plate
Ozone Coordinator, Head of Technology Divison
Environmental Protection Department

LITHUANIA

Ms. Maria Teriosina
Chief Engineer, Ozone Focal Point
Environment Quality, Chemicals Management

Ministry of Environmental Protection and Regional Development
Peldu iela 25
LV 1494 Riga
Latvia
Tel: (371) 702 65 09
Fax: (371) 782 04 42
Email: vilis@varam.gov.lv

Environmental Protection Ministry
A. Jaksuto 4/9
LT-2694 Vilnius
Lithuania
Tel: (37 02) 619617
Fax: (37 02) 220847
Email: marija@nt.gamta.lt

Ms. Ilze Pruse
Coordinator of International Projects
Latvian Environmental Geological and Meteorological Agency
Ilze.Pruse@lvgma.gov.lv
Fax: +371 7145154
Phone: +371 7032029

TAJIKISTAN

Mr. Abdukarim K. Kurbanov
Coordinator of NOU
of Republic of Tajikistan
Bokhar Street 12
Dushanbe 734025
Tajikistan
Tel: (7-3772) 21 65 30
Fax: (7-3772) 21 18 39
Email: abdu_karim@rambler.ru

UZBEKISTAN

Mrs. Nadejda Dotsenko,
National Ozone Officer
State Committee for Nature Protection of the Republic of Uzbekistan,
100078, Tashkent, 5, Mustakilik Square,
tel: (99871) 139 48 23
E-mail: ozon@tkt.uz

BELOW IS JUST A FULL LIST OF THOSE WHO PARTICIPATED IN THE MID-TERM EVALUATION. TO BE USED BY THE EVALUATORS AS APPROPRIATE

List of Evaluation Process Participants (Mid-Term)
Nairobi Staff
Mr. Segbedzi Norgbey,
Chief, Evaluation and Oversight Unit (EOU)
Nairobi, Kenya,
Tel: 254-20-623387
Email: segbedzi.norgbey@unep.org

Ms. Mela Shah
Administrative assistant, EOU
UNEP, P.O. Box 30552, Room – U-307
Nairobi, Kenya,
Tel: 254-20-623740
Fax: 254-20-623158
Email: Mela.Shah@unep.org

Ms. Elaine King,
GEF Coordination, Nairobi, Kenya
Elaine.King@unep.org

Ms. Sheila Aggarwal Khan.
Nairobi, Kenya,
Email: Sheila.Aggartwal-Khan@unep.org

Paris, DTIE (Meetings (Date)
Mr. Rajendra Shende;

Head, Energy and OzonAction Branch,
Tour Mirabeau – 39 -43, Quai Andre Citroen
75739 Paris Cedex 15 Paris, France
Tel: (33-1) 44 37 14 59
Fax: (33-1) 44 37 14 74
Email: mshende@unep.fr

Mr. Suresh Raj
Capacity Building Manager
Tour Mirabeau – 39 -43, Quai Andre Citroen
75739 Paris Cedex 15 Paris, France
Tel: (33-1) 44 37 76 11
Fax: (33-1) 44 37 14 74
Email: suresh.raj@unep.fr

Mr. Yerzhan Aisabayev,
Programme Management Office
Tour Mirabeau – 39 -43, Quai Andre Citroen
75739 Paris Cedex 15 Paris, France
Tel: (33-1) 44 37 14 64
Fax: (33-1) 44 37 14 74
Email: yerzhan.aisabayev@unep.fr

Estonia --
Mr. Inari Truumaa
Head of Group, NOU (Ozone Bureau)
Estonian Environmental Research Centre
Tel: +372 611 2931
Fax: +372 611 2901
Email: inari.truumaa@klab.ee

Ms. Ene Kriis
Program Officer, NOU (Ozone Bureau)
Estonian Environmental Research Centre
Tel: +372 611 2921
Fax: +372 611 2901
Email: ene.kriis@klab.ee

Mr. Margus Kort,
Member of the Board
Central Lab,
Estonian Environmental Research Centre
Tel: +372 611 2903
Fax: +372 611 2901
Email: margus.kort@klab.ee

Mr. Elvo Admann
Dean, Marine Engineering Department
Estonian Maritime Academy
Tel: (+372) 613 5535
Fax: (+372) 613 2099

Mr. Rein Albri
Head, Refrigeration Department
Estonian Maritime Academy
Tel: (+372) 613 5535
Fax: (+372) 613 2099

Mr. Juri Truusa

Leading Senior Officer
Environmental Management and Technology Department
Ministry of Environment
Tel: (+372) 627 3063
Fax: (+372) 660 4613
Email: juri.truusa@ekm.envir.ee

Latvia

Republic of Latvia March 24-28,2004
Mr. Armands Plate
Ministry of Environment
Environmental Protection Department
Head, Technology Division
Tel: +371 702 6509
Fax: +371 782 0442
Email: armands.plate@vidm.gov.lv

Lithuania March 28-29, 2004

Ms. Marija Teriosina,
Head, Chemical Substances Division / Head NOU
Ministry of Environment,
Tel: 370-5-266-35-01
Fax: 370-5-266-35-02
Email: m.teriosina@aplinkuma.lt

Mr. Edgaras Geda,
Chief Specialist,
State Fire Supervision Inspectorate,
Fire and Rescue Department
Tel: 370-5- 271- 68-18
Fax: 370-5- 216-34-94
Email: e.geda@vpgt.lt

Mr. Gediminas Vainius
Technical Director, Laima Ir Partnerial,
Representative of the Refrigeration Association,
Tel: 370-5-216-91-15
Fax: 370-5-216 91-33
Email: cool@laima.lt

Ms. Monika Jakimaviciene,
Director, Grudu Pirkliai,
Tel: 370-5- 213- 07-46
Fax: 370-5-213- 09-56
Email: pirkliai@ttd.lt

Mr. Juozas Reskevicius,
Director, Ekoterma,
Tel: 370-5- 37 342405
Fax: 370-5- 37 342405

Mr. Tomas Simkus
Rolvica
Tel: 8-5 2602087
Fax: 8-5 2602085
Email: tomas@rolvika.lt

Mr. Audrius Tumalavicius,
Rolvica
Tel: 8-5 2602087
Fax: 8-5 2602085
Email: audrius@rolvika.lt

Mr. Mindaugas Stukas, NOU; Ms. Sigita Staskeviciene, NOU;
Ms. Viktorija Karveliene, NOU.
Juozapaviciaus str. 9 room 919 ,
NOU Contact point: Mindaugas Stukas,
Tel./Fax.: (+370 5) 2722874;
E-mail: minstu@nt.gamta.lt

Uzbekistan, March 25-27, 2004

Mrs. Nadezhda Dotsenko
National Coordinator of NOU,
State Committee for Nature Protection (SCNP)
5a, A. Kadizy Str.
700128 Tashkent
Tel: (998 71) 144 91 16
Fax: (998 71) 120 71 29.
ozon@tkt.uz

Farkhat Saydiyev,
Project officer, NOU, SCNP
5a, A. Kadizy Str.
700128 Tashkent
Tel: (998 71) 144 91 16
Fax: (998 71) 120 71 29.
ozon@tkt.uz

Mrs. Ella Tkhay,
Project accountant of NOU, Chief accountant of SCNP
Tel: (998 71) 144 91 16
Fax: (998 71) 120 71 29.
ozon@tkt.uz

Mr. Rakhmatulla Khabirov
Acting First deputy of the Chairman of the SCNP
5a, A. Kadizy Str.
700128 Tashkent
Tel. (998-71) 173 86 37

Mr. Talat Arifkhanov
Scientific-technical progress and public awareness, SCNP
5a, A. Kadizy Str.
700128 Tashkent

Mr. Bakhtiyor Belyalov
Inspector, Central customs lab of the State Customs Committee
Tashkent, Uzbekistan

Dr. Mrs. Svetlana Nikulina,
Environment Programme Manager, ATROF-MUHIT/UNDP
13a, Usmon Nosir str.

700060 Tashkent
Tel/Fax: (998 71) 1527487
svetlana.nikulina@envp.uzsci.net

Mr. Sergey Khomenko
Environment Programme Associate, UNDP
700029 Tashkent
sergey.khomenko@undp.org

Trainers:
Prof. Dr. Sanat Zakirov, Tashkent State Technical University (TSTU)
Prof. Mr. Kudratulla Karimov, Department of refrigeration and compressor plants, TSTU
Mr. Abdusamat Muminov, Head of the laboratory of TSTU
Mr. Vyacheslav Pak, Laboratory assistant, TSTU
Mr. Shakhobitdin Assamitdinov, Lecturer – consultant, Head of company "Savdotekhnikamontazh"

NGOs
Mr. Nikolay Kartashov, Head of foreign relations department of International fund "Ecosan"
Prof. Dr. Saidrasul Sanginov, Director of NGO "Logos"
Mrs. Elmira Rasulova, Representative of social children's fund "Bakhtly kelajagimiz"
Mr. Raim Farkhadi Raim, Chairman of social children's fund "Bakhtly kelajagimiz"
Mrs. Svetlana Skladchikova, Correspondent of newspaper "Tashkentskaya Pravda"

Tajikistan

Mr. Abdukarim Kurbanov
Head of Ozon Unit
State Committee for Environment and Forestry
12 Bohtar str.
734024 Dushanbe
Tel: (992-372) 21 76 28; 25 41 93;
abdu_karim@rambler.ru

Mr. Sharif Rajabov
Deputy Chairman/Chief,
State Committee for Environment and Forestry
Tel: (992-372) 21 65 30
Fax (992-372) 21 18 39

Mr. Khurshed Khusaynov
Deputy Head of Ozon Unit
Head of Refrigeration Association
Tel: (992-372) 24 26 77; 24 69 49
ekaud@rambler.ru

Mr. Timur Nazarov
Head of Department on Ecological Monitoring ,
State Committee for Environment and Forestry
Tel: (992-372) 21 79 94
abdu.karim@rambler.ru

Mr. Umar Nazarov
Accountant, Ozon Unit
Tel: (992-372) 23 08 55; 23 58 91
abdu_karim@rambler.ru

Mr. Aslam Akramov
Deputy Ministr - Head of Customs Department
Ministry of State Revenues and Duties
Tel: (992-372) 21 09 23
Fax: (992-372) 21 46 30

Mr. Rustam Abdusalyamov
Chief Inspector of Division on
Customs Arrangement Improvement and Development
Tel: (992-372) 21 34 87,
Fax: (992-372) 21 46 30

Mr. Alikhon Latifi
Director of Tajik Branch,
Central Asia Regional Ecology Center
Tel: (992-372) 27 47 58,
Fax: (992-372) 21 90 70
alatifi@carec.kz

Kazakhstan

Mr. Alexander Bragin
Director, Department for Int. Cooperation,
Ministry of Environmental Protection
31 Pobedy av., Astana
Tel +7 3172 591972

Mr. Kanat Baigarin
Director, Climate Change Coordination Center
48,Abai St, Astana city
Tel. +7 3172 717170/73
Fax: +7 3172 324738
E-mail: kbaigarin@climate.kz

Ms. Valentina Kryukova
Ozone officer, Coordinator of NOU
30 Beibetshilik av., Astana
tel: +7 3172 580152/153
e-mail: valentina@climate.kz

Mr. Sergey Inyuitin
Consultant, Refrigeration specialist, NOU
30 Beibetshilik av., Astana
tel: +7 3172 580152/153
e-mail: training@climate.kz

Ms. Elena Butina
Chief Specialist, Central Customs Laboratory,
State Customs Agency
Astana
Tel: +7 3172 396838

Mr. Sergey Vassilyev
Consultant, NOU
30 Beibetshilik av., Astana
tel: +7 3172 580152/153
svassilyev@climate.kz

Mr. Syrym Nurgaliev
Administrative Assistant, NOU
30 Beibetshilik av., Astana
tel: +7 3172 580152/153
snurgaliev@climate.kz

Mr. Sergey Polivannyi
"York International"
Astana
Tel: +7-333-225-12-53

Mr. Vadim Kim
Skkada Promclimate" LTD
Astana
Tel: +7-300-788-86-11,

Mr. Anatoly Zavalishin
Vremya" LTD
Astana
Tel: +7-300-382-12-80

Azerbaijan

Mr. Imran Abdulov, National coordinator,
Deputy Head of the Department of Environmental Policy and Environment Protection,
Ministry of Ecology and Natural Resources (MENR)
B. Aqhayev str. 100A
Baku, 370073
Tel. +99412 98 39 07; Fax: +99412 92 59 07
imranabdulov@baku.az

Mr. Issa Aliyev,
Head of the Department of Environmental Policy and Environment Protection
Ministry of Ecology and Natural Resources

Mr. Maharram Mehtiyev,
Director of Climate Change and Ozone Center
(established in 2003)
climoz@online.az

Interviewed officers of former team of NOU:
Prof. Dr. Astan Shahverdiyev, National coordinator (former),
Azerbaijan Technical University
Chief of the Department for Heat and Refrigeration Technique
H. Javid Avn. 25
Baku
Tel./fax: +99412 39 14 32
aslanaztu@yahoo.com

Dr. Ulviyya Hasanova, accountant (former)
Azerbaijan Medical University, Azerbaijan State Oil Academy
RI “Geotechnological problems of gas, oil and Chemistry”
Azadlig Ave.20
Baku
Tel./fax: +99412 93 11 04
ulviyya2000@yahoo.co.uk

Terminal Evaluation of the UNEP GEF project

"Total Sector Methyl Bromide Phase Out in Countries with Economies in Transition"

GF/4040-05-05

PROJECT BACKGROUND AND OVERVIEW

Project rationale

Under the Montreal Protocol, non-Article 5 countries were scheduled to phase out imports of methyl bromide (MB) by 1 January 2005. As such there was an urgent need to bring these countries into compliance with the Montreal Protocol. The main MB-consuming countries participating in this project – Bulgaria, Hungary, Latvia, Lithuania and Poland – have previously participated in a UNEP/GEF Medium-sized project, which led to reductions in the use of methyl bromide. Further adoption of alternatives had stalled primarily due to a lack of investment resources, training and technical capacity. On the eve of the total phase out deadline, therefore, this project was though to be absolutely crucial, and was designed to assist these countries to rapidly transfer existing alternatives and adapt them to the needs of local users. Azerbaijan and Uzbekistan have zero consumption of methyl bromide, but will participate in regional activities so that use of this fumigant will not start in future.

The overall goal of the project was stated as 'to rapidly phase-out all non-exempted uses of methyl bromide (MB) in seven CEIT countries (Bulgaria, Hungary, Latvia, Lithuania, Poland, Azerbaijan and Uzbekistan). The elimination of about 167 metric tonnes MB used annually will enable these countries to comply with the Montreal Protocol requirement to phase-out MB imports in 2005, excluding qua*rantine and other exempted uses*.'

The main project objectives and outputs were as follows:

i. The leveraging of existing infrastructure and local expertise for the development and implementation of cost-effective, national phase out co-ordination structures and mechanisms to carry out the work of the project,
ii. Rapid transfer of alternative technologies to methyl bromide users, including installation of relevant equipment and participatory training at local level, focusing on a rapid replacement for the 2005 growing season to permit country compliance with the Montreal Protocol (based on alternative fumigants to the extent necessary);
iii. Enhanced awareness and confidence of MB users and stakeholders in the phase-out process, providing easy-to-use technical information materials for the MB users, and increasing users' ability to manage their pest control problems and find their own solutions. Monitoring the technical efficacy and economic performance of alternatives, improving alternatives where necessary to achieve phase-out.
iv. Building capacity and carrying out pilots for the longer-term development of more sustainable alternatives based on non-chemical or IPM methods, reducing dependency on potentially hazardous chemical alternatives to ensure sustainability in the long term. This also has interlinkages with chemical management and enhanced health security.

Relevance to GEF Programmes

The activity is consistent with the GEF Focal Area of Ozone Depletion, and the GEF Strategic Priority called 'Ozone Depletion OZ-1 Methyl Bromide Reduction'. The GEF Operational Strategy for the Ozone Depletion Focal Area, as well as the strategic priority for the Ozone Depletion Focal Area aim "to reduce - and to the extent feasible, eliminate -- the remaining Ozone Depleting Substances (ODS): methyl bromide and HCFCs". It should be recognised that implicit in this priority is the goal of bringing Article 2 countries into compliance with the Montreal Protocol, which requires phase-out of non-exempted uses in 2005.

The project is also consistent with the GEF document 'GEF Support to Countries with Economies in Transition in Phasing Out of Annex C1 and E Substances of the Montreal Protocol' (GEF/C.18/Inf.6) which states that "In order to achieve compliance with the Montreal Protocol, a full phase out of all reported (non-QPS) consumption (and production) needs to be achieved by the end of 2004… consumption needs to be reduced from the current levels… to zero in 2005."

Executing Arrangements

UNEP implemented the non-investment components of the project, while UNDP implemented the investment components. UNEP appointed a full-time Project Coordinator and Project Assistant, and organised the regional activities listed in the project document. Much of the co-ordination and execution arrangements for the project lay in the hands of the countries and stakeholders, with the national Project Co-ordination Units ensuring that on-the-ground activities ran smoothly. They were to be monitored by national M&E groups, who were to give feedback to the national PCU Steering Committees, as well as the Regional/International Project Steering Committee upon which implementing agencies sit.

Project Activities

The project duration was set at 36 months. The GEF approved the project May 1, 2004, though CEO endorsement was not received until November, 2004. UNEP approval came in February 2005, and the project was set to be completed in December 2007.

The project had nine components:

1. Establishment of international and national co-ordination structures for organising and implementing the project, and to ensure continuing stakeholder participation
2. Technical work to assist the registration of alternative pest control products where necessary, and additional related policy adjustments to support alternatives
3. Training of trainers
4. Training and on-site technical assistance for MB fumigators and other relevant MB users
5. Procurement and installation of alternative equipment in companies and sites where MB is used (investment)
6. Pilots, i.e. monitoring of the technical efficacy and economic performance of alternatives installed on farms and user sites
7. Production of information materials for MB users
8. Capacity building and pilots for the longer term implementation of more sustainable alternatives
9. Monitoring and evaluation of project progress and results, so that the project can be regularly adjusted/improved in the light of M&E results.

Budget

The total budget was US$ 7,295,329 with US$ 5,000,000 funded by the GEF Trust Fund and in-kind co-funding from; Bulgaria US$515,187, Hungary US$ 541,064, Latvia US$120,800, Lithuania US$150,200, Poland 918,078 and FAO (in-kind) US$ 50,000. This excludes the PDF-B financing of US$ 175,500.

TERMS OF REFERENCE FOR THE EVALUATION

Objective and Scope of the Evaluation

As shown above for the Terms of Reference for the *GEF Ozone Portfolio*.

Methods

As shown above for the Terms of Reference for the *GEF Ozone Portfolio*.

The findings of the evaluation will be based on the following:

1. A desk review of project documents including, but not limited to:
    (a) The project documents, outputs, monitoring reports (such as progress and financial reports to UNEP / UNDP and GEF annual Project Implementation Review reports) and relevant correspondence.
    (b) Review of specific products including awareness products, outreach and technical materials generated.
    (c) Notes from the Steering Committee and other meetings.
2. Consultation with project staff and key stakeholder groups, especially private sector partners, during field visits to project locations in countries.

3. Interviews with project management (such as Project Coordinators, the Executing Agency, UNEP GPA Coordination Office, etc.).
4. Interviews and telephone interviews with other stakeholders, including NGOs which participated in the project. As appropriate, these interviews could be combined with an email questionnaire.
5. The Consultants shall determine whether to seek additional information and opinions from representatives of donor agencies and other organisations by e-mail or through telephone communication.

Project Evaluation Criteria

As shown above for the Terms of Reference for the *GEF Ozone Portfolio*.

The scope of the evaluation is guided by the "*Global Environment Facility Guidelines for Implementing Agencies to conduct Terminal Evaluations, May 2003*"[601] to evaluate the activities supported by GEF through this project. As such, a comprehensive mid term review, will provide valuable information and useful experience for the project in advance of the terminal evaluation of the project.

The draft and final reports will be assessed as for the Terms of Reference for the *GEF Ozone Portfolio.*

Submission of Final Terminal Evaluation Reports

As described in the Terms of Reference for the *GEF Ozone Portfolio.*

Resources and schedule of the evaluation

As described in the Terms of Reference for the *GEF Ozone Portfolio.*

Schedule Of Payment

As described in the Terms of Reference for the *GEF Ozone Portfolio.*

OVERALL RATINGS TABLE

As described in the Terms of Reference for the *GEF Ozone Portfolio.*

[601] http://www.gefweb.org/MonitoringandEvaluation/MEPoliciesProcedures/MEPTools/IA_Guidelines_for_TE.pdf

Blank page for double-sided printing

Annex 2. Co-financing and Leveraged Resources

Co-financing (basic data to be supplied to the consultant for verification)

Co financing (Type/Source)	IA own Financing (mill US$)		Government (mill US$)		Other* (mill US$)		Total (mill US$)		Total Disbursement (mill US$)	
	Planned	Actual	Planned	Actual	Planned	Actual	Planned	Actual	Planned	Actual
Grants										
Loans/Concessional (compared to market rate)										
Credits										
Equity investments										
In-kind support										
Other (*) - -										
Totals										

* Other is referred to contributions mobilized for the project from other multilateral agencies, bilateral development cooperation agencies, NGOs, the private sector and beneficiaries.

Leveraged Resources

Leveraged resources are additional resources—beyond those committed to the project itself at the time of approval—that are mobilized later as a direct result of the project. Leveraged resources can be financial or in-kind and they may be from other donors, NGO's, foundations, governments, communities or the private sector. Please briefly describe the resources the project has leveraged since inception and indicate how these resources are contributing to the project's ultimate objective.

Blank page for double-sided printing

Annex 3

As described in the Terms of Reference for the *GEF Ozone Portfolio.*

Annex 4 GEF Minimum requirements for M&E

As described in the Terms of Reference for the *GEF Ozone Portfolio.*

Minimum Requirement 2: Application of Project M&E

Project monitoring and supervision will include implementation of the M&E plan, comprising:

- Use of SMART indicators for implementation (or provision of a reasonable explanation if not used)
- Use of SMART indicators for results (or provision of a reasonable explanation if not used)
- Fully established baseline for the project and data compiled to review progress
- Evaluations are undertaken as planned
- Operational organizational setup for M&E and budgets spent as planned.

SMART INDICATORS GEF projects and programs should monitor using relevant performance indicators. The monitoring system should be "SMART":

1. **Specific**: The system captures the essence of the desired result by clearly and directly relating to achieving an objective, and only that objective.
2. **Measurable:** The monitoring system and its indicators are unambiguously specified so that all parties agree on what the system covers and there are practical ways to measure the indicators and results.
3. **Achievable and Attributable:** The system identifies what changes are anticipated as a result of the intervention and whether the result(s) are realistic. Attribution requires that changes in the targeted developmental issue can be linked to the intervention.
4. **Relevant and Realistic:** The system establishes levels of performance that are likely to be achieved in a practical manner, and that reflect the expectations of stakeholders.
5. **Time-bound, Timely, Trackable, and Targeted:** The system allows progress to be tracked in a cost-effective manner at desired frequency for a set period, with clear identification of the particular stakeholder group to be impacted by the project or program.

MB Project LogFrame				
	Project strategy	**Objectively verifiable indicators**	**Sources of verification**	**Assumptions (based on risks with the potential to be realised)**
Goal (global)	Preservation of the stratospheric ozone layer			
Objective (global)	Compliance with the Montreal Protocol through the phase out of methyl bromide consumption			
Outcomes (regional)	Sector phase-out of methyl bromide in CEITs	Reduction of MB consumption in all sectors to zero, except for QPS and exempted uses.	National surveys and monitoring. Article 7 reporting under the Montreal Protocol to the Ozone Secretariat by countries	Need to ensure there are functional monitoring and evaluation mechanisms in each country
Outputs (regional and national)	Development and implementation of cost-effective, sustainable, national phase-out co-ordination structures and mechanisms to cope with methyl bromide phase out, including future problem areas, and to sustain phase out post-project;	Permanent National Steering Committee, Technical Group, and trained extension service and user groups in countries at project end; registration of additional pest control products where needed; implementation of additional policy measures where needed	Official commitment from the national ozone unit (NOU) and relevant government agencies on maintaining co-ordination committees and ensuring that extensionists and others continue to promote project principles etc.	Commitment expressed by stakeholders during the PDF-B is genuine. The Project Co-ordination Unit and national Monitoring and Evaluation bodies will carry out their tasks effectively and as scheduled
	Rapid transfer of replacement technologies to MB users, including installation of relevant equipment and participatory training at local level, focusing on a rapid replacement (based on alternative fumigants if necessary) for the 2005 growing season, to permit country compliance with the Montreal Protocol. Following this, focus on non-chemical and IPM MB alternatives from 2006 onwards.	Replacement of MB use in sectors by chemical and non-chemical alternatives at the end of the project.	Ozone Secretariat MB consumption data for 2004 onwards. Detailed regular reports by the Project Co-ordination Unit and the national Monitoring and Evaluation Unit (M&E) on the progress of MB replacement amongst MB users across sector and sub sectors	Timely and honest reporting by all parties concerned so that the project's impact can be monitored as it progresses

MB Project LogFrame				
	Project strategy	**Objectively verifiable indicators**	**Sources of verification**	**Assumptions (based on risks with the potential to be realised)**
	Enhanced awareness and confidence of MB users and other stakeholders in the phase out process, as a result of technology transfer support activities including monitoring of the technical and economic performance of alternatives, making improvements where necessary, providing easy-to-use technical information materials for the MB user, and increasing users' ability to manage their pest control problems and find solutions.	Regular survey on stakeholder mentality and attitude throughout project implementation. Adoption rate of methyl bromide alternatives by MB users. Regularity and efficacy of encounters with extension: training activities and field visits	Detailed regular reports by the Project Co-ordination Unit and the national M&E Unit on the progress of MB replacement amongst MB users across sector and sub sectors. Survey reports of the national M&E units, will include investigations into the mindset of the MB users towards the project and phase out exercise	Honest dialogue between MB users and the other stakeholders and M&E body, such that the true opinions and mentality of all stakeholders is clear, and the genuine commitment and support to sustaining post project phase out
	Capacity building for the development of more environmentally sustainable alternatives (primarily non-chemical methods), reducing dependency on chemical alternatives to ensure sustainability in the long term.	Increased capacity for the development and adoption of non-chemical and sustainable MB alternatives in both sectors. Identification of viable non-chemical alternatives as a result of pilots.	Reports by the Project Co-ordination Unit and the national Monitoring and Evaluation Unit on the progress of non-chemical and IPM MB alternatives amongst MB users across sector and sub sectors	Non-chemical alternatives exist and the data on their efficacy and utility in other countries are correct

Blank page for double-sided printing

Annex 2 Evaluator Expertise

TouchDown Consulting sprl is a consultancy company established in Brussels Belgium. The experts in Touchdown have substantial skills in chemical substitution; policy development; project management; working with diverse stakeholder groups (such as industry, NGO, inter-governmental committees); the preparation of reports, briefings, policy papers and reviews; monitoring and evaluation; strategies; and the analysis and evaluation of complex technical data.

TouchDown Consulting experts have served on international bodies aimed at reducing chemicals in food and the environment by promoting the adoption of technically and economically feasible alternatives. They have extensive experience in data collection, development of appropriate methodologies, analysis of complex data, identification of policy options and mitigation strategies, as well as initiating, managing and evaluating projects and programmes.

Dr Tom Batchelor is a Director of Touchdown Consulting. He was the *Lead Evaluator* for this project. Dr Batchelor has more than 25 years experience in analysing complex technical data and policy information in order to identify options, to develop appropriate strategies to achieve identified goals. He has experience in monitoring and evaluating projects and programmes using qualitative and quantitative approaches, and in reviewing and re-focusing projects so that objectives can be achieved more effectively. Dr Batchelor has worked with staff in the implementing agencies of the World Bank, UNDP, UNIDO and UNEP. He is able to facilitate discussions among stakeholders who hold diverse opinions and perspectives, enabling groups to reach consensus. He is experienced in working with people from diverse cultures and organisations based in different geographic locations.

Mr Valery Smirnov was the *Supporting Evaluator* for this project. Mr Smirnov is a fluent in Russian and has wide-ranging experience in the evaluation of ODS phase out proposals submitted by developing country governments to the MLF. His engineering qualifications led to his involvement in the evaluation of the UNDP incentive programme to retrofit/replace non-ODS equipment in the commercial refrigeration sector. He was involved in the development a number of policy papers for the MLF which estimated the cost of phasing out CFCs and HCFCs in developing countries. He has undertaken field visits to Kyrgyzstan and Moldova in preparation for case studies on the phase out of ODS. His work with the MLF has involved formulating recommendations on the choice of non-ODS technology, determination of incremental costs for ODS reduction and phase out, and the development of guidelines to facilitate the development of ODS elimination plans. Mr Smirnov's experience in this work resulted in significant interactions with staff in the implementing agencies of the World Bank, UNDP, UNIDO and UNEP. He was Executive Secretary of the Russian Federation National Ozone Committee which required him to undertake all activities associated with the reduction and phase out of ODS, including the collection and reporting of ODS consumption data to the Montreal Protocol.

Blank page for double-sided printing

Annex 3 Responsibilities & Mission Schedule

The mission dates, location, mission participation and assignment of responsibility between the consultants are shown in the Table below for contracts relating to the work on the Evaluations for UNEP on "*Evaluation of the GEF Ozone Portfolio*" and "*Total Sector Methyl Bromide Phase Out in Countries with Economies in Transition*".

The costs[602] of the mission in Kazakhstan and Uzbekistan were shared with the GEF consultancy fee for work carried out at the same time on the "*Impact Evaluation of the Phase Out of Ozone-Depleting Substances in Countries with Economies in Transition*".

In these project assessments, Mr Valery Smirnov was assigned the four Russian-speaking countries of Armenia, Azerbaijan, Tajikistan and Turkmenistan; and Dr Tom Batchelor was assigned responsibility for the remaining countries that were in Europe (Bulgaria, Estonia, Hungary, Latvia, Lithuania, Poland) and Central Asia (Kazakhstan and Uzbekistan).

No	Mission dates		Location		Mission Participation		Assigned responsibility			
	Arrive	Depart	Countries	UNEP	Tom Batchelor	Valery Smirnov	T. Batchelor		V. Smirnov	
							MB	ODS	MB	ODS
1	10-Feb	14-Feb	Armenia	M-TR		✓				✓
2	18-Feb	21-Feb	Azerbaijan	TR		✓			✓	✓
3	21-Feb	28-Feb	Kazakhstan	TR	✓	✓		✓		
4	28-Feb	08-Mar	Uzbekistan	TR	✓	✓	✓	✓		
5	07-Mar	11-Mar	Turkmenistan	TR		✓				✓
6	30-Mar	02-Apr	Tajikistan	TR		✓				✓
7	15-Mar	19-Mar	Poland	TR	✓	✓	✓			
8	DS	DS	Lithuania	TR			✓	✓		
9	22-Mar	25-Mar	Estonia	TR	✓	✓		✓		
10	26-Apr	28-Apr	Latvia	TR	✓		✓	✓		
11	14-Apr	15-Apr	Hungary	TR	✓		✓			
12	16-Apr	17-Apr	Bulgaria	TR	✓		✓			

M-TR = Mid-term report; TR = Terminal Report; DS = Desk Study; MB = "*Impact Evaluation of the Phase Out of Ozone-Depleting Substances in Countries with Economies in Transition*"; ODS = "*Evaluation of the GEF Ozone Portfolio*"

[602] Batchelor, T.A., Smirnov, V. and LA Risby. 2009. Impact Evaluation of the Phase Out of Ozone-Depleting Substances in Countries with Economies in Transition. *Volume 1: Theory of Change*. Report to the Global Environment Facility Evaluation Office. 7 August 2009. 181 pp.
Batchelor, T.A., Smirnov, V. and LA Risby. 2009. Impact Evaluation of the Phase Out of Ozone-Depleting Substances in Countries with Economies in Transition. *Volume 2: Country Reports*. Report to the Global Environment Facility Evaluation Office. 7 August 2009. 271 pp.

Blank page for double-sided printing

Annex 4 Documents Reviewed

This section provides a list of the main documents reviewed for the **Section 8: "Project Performance, Impact and Ratings"** in this report. Specific references to documents were included as footnotes to the relevant text in the report.

GENERAL REFERENCES

Ausher, R. 2003. Evaluation of the project on initiating the early phase-out of methyl bromide in countries with economies in transition through awareness-raising, policy development and demonstration and training activities. GF/4040-00-10. UNEP Evaluation and Oversight Unit. 42pp.

Batchelor, T.A., Smirnov, V. and LA Risby. 2009. Impact Evaluation of the Phase Out of Ozone-Depleting Substances in Countries with Economies in Transition. *Volume 1: Theory of Change*. Report to the Global Environment Facility Evaluation Office. 7 August 2009. 181 pp.

Batchelor, T.A., Smirnov, V. and LA Risby. 2009. Impact Evaluation of the Phase Out of Ozone-Depleting Substances in Countries with Economies in Transition. *Volume 2: Country Reports*. Report to the Global Environment Facility Evaluation Office. 7 August 2009. 271 pp.

Buxton, G.V. & R. Ciconkov. 2004. A Mid-Term Evaluation of UNEP's GEF-Sponsored Capacity Development and Institutional Strengthening Projects in Countries with Economies in Transition. Report prepared for UNEP-EO. 174pp.

FAO. 2008. Alternatives to replace methyl bromide for soil-borne pest control in East and Central Europe. Manual. Edited by R. Labrada. FAO, Rome. 94pp.

FAO. 2008. Workshop on non-chemical alternatives to replace methyl bromide as a soil fumigant. Report of Workshop held 26-28 June 2007 in Budapest (Hungary). 136pp

Oberthür, S. 2000. Evaluation report. Study of impacts of GEF activities on phase-out of ozone depleting substances. Report undertaken for the GEF. 60pp.

GEF. 2003. GEF Inter-sessional Work Programme Submission: Total Sector Methyl Bromide Phase Out in Countries with Economies in Transition. 51pp.

MLF. 2000. Desk Study on Recovery and Recycling Projects. UNEP/OzL.Pro/ExCom/31/18. 26pp.

MLF. 2000. Final Report on the 1999 Evaluation of Refrigeration Projects and Draft Follow-Up Action Plan. UNEP/OzL.Pro/ExCom/30/05. 4pp.

MLF. 2001. Final Report on the Evaluation of the Foam Projects. UNEP/OzL.Pro/ExCom/33/06. 32pp.

MLF. 2002. Final Report on the Evaluation of the Aerosol Projects. UNEP/OzL.Pro/ExCom/38/05. 50pp.

MLF. 2003. Final report on the evaluation of the halon sector. UNEP/OzL.Pro/ExCom/40/08. 53pp.

MLF. 2004. Desk Study on Methyl Bromide Projects. UNEP/OzL.Pro/ExCom/43/08. 37pp.

MLF. 2004. Final evaluation report on halon banking projects for countries with low volumes of installed capacity. UNEP/OzL.Pro/ExCom/44/10. 27 pp.

TEAP. 2009. Critical Use Nominations for Methyl Bromide. Annex IV. Part A: Trend in Pre-Plant Soil Applications. Part B: Trends in Post-harvest Structural and Commodity Applications. Period 2005 to 2010. Information supplied by the Ozone Secretariat to MBTOC. Pages 79-83.

UNEP. 2000. Project Formulation, Approval, Monitoring and Evaluation. Manual.

UNEP. 2006. Ozone Secretariat. Handbook for the Vienna Convention for the Protection of the Ozone Layer - 7th Edition.

UNEP. 2008. Annex 3E Format for Terminal Report. Lithuania Total Sector Phase Out of Methyl Bromide in Economy in Transition. 12pp

UNEP/UNDP. 2006. GEF Full-sized Project "*Total Sector Methyl Bromide Phase Out in CEITs*". On to a Successful Methyl Bromide Total Phase Out! Workshop held in Plovdiv (Bulgaria) on 16-17 October 2006. Organised by UNEP-DTIE in cooperation with the National Service for Plant Protection & the Ministry of Agriculture and Forestry in Bulgaria. 45 pp.

Velders, J.M., Andersen, S.O., Daniel, J.S., Fahey, D.W. and M. McFarland. 2007. The Importance of the Montreal Protocol in Protecting Climate. http://www.pnas.org/content/104/12/4814.abstract

ARMENIA

Anon. 2006. UNEP GEF PIR (1 July 2005 to 30 June 2006) GF/4040-05-02– Armenia: Institutional Strengthening ad Capacity Building – Establishment of an Ozone Office and Training for Customs Officers and Refrigeration Technicians 6pp.

Anon. 2007. UNEP GEF PIR (1 July 2006 to 30 June 2007) GF/4040-05-02– Armenia: Institutional Strengthening ad Capacity Building – Establishment of an Ozone Office and Training for Customs Officers and Refrigeration Technicians 30pp.

Anon. 2008. UNEP GEF PIR (1 July 2007 to 30 June 2008). GF/4040-05-02– Armenia: Institutional Strengthening ad Capacity Building – Establishment of an Ozone Office and Training for Customs Officers and Refrigeration Technicians.

Anon. 2002. UNDP. Armenia. Sub-Project. Monitoring the Activities in the RMP Sub-project. 2p.

Anon. 2002. UNDP. Armenia. Sub-Project. National Programme for Recovery and Recycling of Refrigerants 11pp.

Anon. 2002. UNDP. Armenia. Sub-Project. Phase-out of CFC 11/12 mixture in the Manufacture of Aerosols by

Anon. 2002. UNDP. Armenia. Sub-Project. SAGA-Phase out of CFC-11 and CFC-12 by Conversion to CO2, HFC-134a and R-404 in the Manufacture of Commercial Refrigeration Equipment. pp56. . 2p.

Anon. 2002. UNEP. Armenia. Sub-Project. Institutional Strengthening and Capacity Building 45pp.

Anon. 2002. UNEP. Armenia. Sub-Project. Training of Refrigeration Technicians Sub-project 6pp.

Anon. 2008. GEF EO Ozone Impact Evaluation Project Review. 4pp.

Anon.2002. UNDP-UNEP Country Programme for Phasing out Ozone Depleting Substances. 41pp.

Anon.2002. UNDP-UNEP Project Brief. Armenia: Country Programme for Phasing out Ozone Depleting Substances. 30pp.

Anon. 2002. UNDP. Armenia. Sub-Project Conversion to Hydrocarbon Propellant at Yerevan Household Chemistry Plant. 14pp.

MLF. 2006. Report of the Meeting of Experts to Assess the Extent of Current and Ffuture Requirements for the Collection and Disposition of Non-reusable and Uunwanted ODS in Article 5 countries; UNEP/OzL.Pro/ExCom/48/42. 139pp.

MLF. 2007. Extended Desk Study on Incentive Programmes for Retrofits. UNEP/OzL.Pro/ExCom/52/8. 37pp.

Ozone Secretariat. ODS consumption of Armenia ODS Data Centre. 1 pp summary sheet.

Ozone Secretariat. Recommendations of the Implementation Committee related to compliance of Armenia with the Montreal Protocol. Data Centre.

Ozone Secretariat. 2006. Decisions related to compliance with the Montreal Protocol by Armenia. Handbook for the Montreal Protocol on Substances that Deplete the Ozone Layer.

TEAP. 2002. FTOC. Report of the Rigid and Flexible Foams. 138pp.

AZERBAIJAN

Anon. 2006. Ministry of Ecology and Natural Resources of Azerbaijan. Official site. Law of the Azerbaijan Republic on Protection of Atmospheric Air. 18pp.

GEF. 2002. GEF EO Ozone Impact Evaluation Project Review. 4pp.

GEF. 2006. Project ID 3185. Continued Institutional Strengthening Support for CEITs to meet the obligations of the Montreal Protocol in Kazakhstan, Tajikistan, Uzbekistan and Azerbaijan.

Ozone Secretariat. Recommendations of the Implementation Committee related to compliance of Azerbaijan with the Montreal Protocol. Data Centre.

Ozone Secretariat. 2006. Decisions related to compliance with the Montreal Protocol by Azerbaijan. Handbook for the Montreal Protocol on Substances that Deplete the Ozone Layer.

TEAP. 1995. Report of the TEAP Ad-Hoc Working Group on CEIT Aspects.

UNDP. 1998. Azerbaijan. Sub-Project. Conversion of Compressor Manufacturing Facility in Sumgayit. 17pp.

UNDP. 1998. Azerbaijan. Sub-Project. Elimination of CFCs in the Manufacture of Domestic Refrigerators at Chinar. 24pp.

UNDP. 1998. Azerbaijan. Sub-Project. Halon Management and Banking National Recovery/Recycling Centre. 9pp.

UNDP. 1998. Azerbaijan. Sub-Project. National Programme for Recovery and Recycling of Refrigerants 11pp.

UNDP. 1998. Azerbaijan. Sub-Project. National Programme for Recovery and Recycling of Refrigerants 11pp.

UNDP. 2002. Project Implementation Report: Azerbaijan Country Programme. 6pp.

UNEP. 1998. Azerbaijan. Sub-Project. Institutional Strengthening; Establishing of a National Ozone Office 4pp.

UNEP. 1998. Azerbaijan. Sub-Project. Training of Trainers for Use of ODS-free Refrigerants. 4pp.

BULGARIA

European Commission. 2009. European Community Management Strategy for the Phase Out of Critical Uses of Methyl Bromide. Updated annually for DG ENV by Touchdown Consulting Brussels. 80 pp.

GEF. 2003. Programme Development Facility (PDF) Block B Request. UNEP. 41 pp.

Ozone Secretariat. 2006. Decisions related to compliance with the Montreal Protocol by Bulgaria. Handbook for the Montreal Protocol on Substances that Deplete the Ozone Layer. Decisions X/25, IX/30, and VIII/23. 7th Edition.

Ozone Secretariat. 2009. ODS consumption Bulgaria for: Annex A Group 1, Annex A Group II, Annex B Group I, Annex B Group II, Annex B Group III, Annex C Group I, Annex C Group II, Annex C Group III, and Annex E Group 1. ODS Data Centre. 1 pp summary sheet.

UNDP. 2003. Total Sector Methyl Bromide Phase Out in Countries with Economies in Transition. GEF – UNDP Project Document. 29 pp.

UNEP. 2006. GEF Full-sized Project "Total Sector Methyl Bromide Phase Out in CEITs – On to a successful methyl bromide total phase out !". Report of UNEP/UNDP GEF Regional Workshop. 45pp.

UNEP. 2008. UNEP GEF PIR FY 2008 Review 1. For the period 1 July 2007 to 30 June 2008. 50 pp.

UNEP. 2008? Monitoring and Evaluation Report: Bulgaria. Annex 4. 4pp.

ESTONIA

Anon. 1999. Refrigerant Management Plan. Republic of Estonia. Annex II. 14pp

Estonian Centre. 2007. Restrictions on the consumption of methyl bromide in Estonia. 6pp.

Estonian Environment Research Centre. 2002. Train the trainers workshop on good practices in refrigeration. Report to UNEP. 21pp.

Estonian Environment Research Centre. 2005. Ozone Bureau Annual Report for 2001 – 2004. 99pp.

Estonian Environment Research Centre. 2009. Estonia compliance with Regulation 2038/2000 on "Substances that Deplete the Ozone Layer" from 12 November 2004. 115pp.

Estonian Environment Research Centre. 2009. Quantity of halon recovered, reclaimed and recycled from 2000 to 2008. 1pp.

Estonian Environment Research Centre. 2009. Quantity of methyl bromide consumed in Estonia in 2004 and 2005. 7pp.

Ministry of Environment. 2007. Violations and penalties related to ozone-depleting substances. 6pp

Ministry of Environment. 2008. Interceptions of illegal trade in ozone-depleting substances. Report to the European Commission showing zero consumption. 6pp

Ministry of Environment. 2008. Methyl bromide consumption for QPS in 2007. Report to the European Commission showing zero consumption. 6pp

Ministry of Environment. 2008. Systems established in Estonia to promote the recovery of ozone-depleting substances. Report to the European Commission showing zero consumption. 5pp

Ministry of Environment. 2009. Ambient Air Protection Act, including *inter alia* general rules for ozone-depleting substances and reporting requirements for F-gases, qualification requirements, and logbooks for use. 42pp

Ministry of Environment. 2009. Organogram showing responsibilities within Latvian Ministries for protection of the environment. 6pp

Ministry of Environment. 2009. Table of ozone-depleting substances placed on the market in Estonia from 1997. 7pp

Ministry of the Environment. 2003. Manual for Environmental and Customs Inspectors for ozone-depleting substances. 99pp.

Ministry of the Environment. 2007. The stratospheric ozone layer 1987 – 2007. 24pp.

Ministry of the Environment. 2007. The sun and the ozone layer – impacts for man on earth. 51pp.

MLF. 2002. Report on the Desk Study on Halon Projects. UNEP/OzL.Pro/ExCom/37/06. 17pp.

MLF. 2003. Final Report on the Evaluation of the Halon Sector. UNEP/OzL.Pro/ExCom/40/08. 35pp.

MLF. 2004. Final Evaluation Report on Halon Banking Projects for Countries with Low Volumes of Installed Capacities. UNEP/OzL.Pro/ExCom/44/10. 27pp.

Ozone Secretariat. 2006. Decisions related to compliance with the Montreal Protocol by Estonia. Handbook for the Montreal Protocol on Substances that Deplete the Ozone Layer. Decisions X/25, IX/30, and VIII/23. 7th Edition.

Ozone Secretariat. 2009. ODS consumption Estonia for: Annex A Group 1, Annex A Group II, Annex B Group I, Annex B Group II, Annex B Group III, Annex C Group I, Annex C Group II, Annex C Group III, and Annex E Group 1. ODS Data Centre. 1 pp summary sheet.

UNDP. 1999. Subproject 3: Regional Halon Management Scheme Programme. 8pp

UNEP. 1999. Programme for phasing out ozone-depleting substances. Medium-sized project brief. 17pp.

UNEP. 1999. Project 1: Institutional Strengthening and capacity building. 4pp

UNEP. 1999. Subproject 2.1: Training of trainers in refrigerant service. 8pp

UNEP. 1999. Subproject 2.2: National programme for recovery and recycling of refrigerants. 12pp

UNEP. 2005. Format for the Annual Report: Estonia Institutional Strengthening and capacity building. Annex 6. 20pp

UNEP. 2005. FY05 GEF Annual Portfolio Review. Report by UNEP. 23pp

UNEP. 2006. UNEP GEF PIR FY 06. Report by UNEP. 31pp

UNOPS. 2002. Certificate of completion for the Regional Halon Management Project. 8pp

HUNGARY

Biobest. 2009. Use of biological agents to control pests in glasshouses in Hungary. Arpad Biocontrol publication. 12pp

GEF. 2003. Programme Development Facility (PDF) Block B Request. UNEP. 41 pp.

Hungarian Refrigeration and Air-Conditioning Association. Description of activities and mandate. Machine translation from Hungarian to English. 7 pp

Metisol. 2009. Sandwich Panel manufacture. 18 pp

Ministry for Environment. 1998. Phase out of ozone-depleting substances in Hungary. Account on the Country Programme and on the World Bank – GEF Project for Phaseout of ozone-depleting substances. Karakter Publications. 76 pp.

Ozone Secretariat. 2006. Decisions related to compliance with the Montreal Protocol by Hungary. Handbook for the Montreal Protocol on Substances that Deplete the Ozone Layer. Decisions X/25, IX/30, and VIII/23. 7th Edition.

Ozone Secretariat. 2009. ODS consumption Hungary for: Annex A Group 1, Annex A Group II, Annex B Group I, Annex B Group II, Annex B Group III, Annex C Group I, Annex C Group II, Annex C Group III, and Annex E Group 1. ODS Data Centre. 1 pp summary sheet.

UNEP. 2008. Project Final Report on Total Sector Phase Out of Methyl Bromide in CEITs: Hungary.

World Bank. 1994. Hungary technical support and investment projects for the phase out of ozone-depleting substances. Project implementation schedule and supervision plan. Schedule D 4pp; Component III Industrial investment sub-projects 7 pp; Achievement of objectives 16 pp

World Bank. 1999. Technical Support and investment project for the phase out of ozone-depleting substances. ICR Report. 2pp

KAZAKHSTAN

Bozheyeva, G. 2000. The Pavlodar chemical weapons plant in Kazakhstan: History and legacy. The Nonproliferation review / Summer 2000. Page 136 – 145

Djumagaliev R.M. and others. 2007. Reducing the use of halons in Kazakhstan. Problem of global climate change. Greenhouse effect. Reduction of the ozone layer due to ozone-depleting substances. Book of about 250 pp. ISBN 9965-538-89-1

Ministry of Nature Resources and Environmental Protection. 1999. Country programme for the phase out of ozone-depleting substances in the Republic of Kazakhstan. 33pp

Oasis Group. 2009. Brochure that describes the company and its refrigeration products. www.oasis.kz/index_en.php

Ozone Secretariat. 2006. Decisions related to compliance with the Montreal Protocol by Kazakhstan. Handbook for the Montreal Protocol on Substances that Deplete the Ozone Layer. Decisions X/25, IX/30, and VIII/23. 7th Edition.

Ozone Secretariat. 2009. ODS consumption Kazakhstan for: Annex A Group 1, Annex A Group II, Annex B Group I, Annex B Group II, Annex B Group III, Annex C Group I, Annex C Group II, Annex C Group III, and Annex E Group 1. ODS Data Centre. 1 pp summary sheet.

Pavlodar Chemical Plant. 2009. Description of the company and its chemical manufacturing activities. http://biistate.net/chemconference/inst_pavlo.html

Remtec International. 2009. Defender C700 Halon Recover Unit. www.remtec.net/ourproducts_defenderc700recoveryunit.asp

UNDP. 2000. Kazakhstan programme for phasing out ozone-depleting substances. 29pp

UNDP. 2000. Sub-project 3: National Halon Management Scheme Programme. 10pp

UNDP. 2002. Project Implementation Report. Kazakhstan Country Programme. 5pp

UNDP. 2003. Project Implementation Report. Kazakhstan Country Programme. 6pp

UNDP. Project Document: Elimination of the remaining uses of CFC-11 through LIA technology in the manufacture of flexible polyurethane foam for comfort applications in Kazakhstan. 8pp

UNDP. Project Document: National Programme for recovery and recycling of refrigerants. 20pp

UNDP. Project Document: Replacement of CFC-113 in the cleaning of oxygen manufacturing equipment at Pavlodar. 8pp

UNDP. Project Document: Terminal umbrella project. Conversion from CFC-11 to water-based technology in the manufacture of rigid polyurethane foam for thermal insulation in Kazakhstan. 17pp

UNEP. 2005. FY05 GEF Annual Portfolio Review / Individual Project Implementation Review Report. 20pp

UNEP. 2006 or 2007. Annex 6: Format for the Terminal Report. Programme for phasing out ozone-depleting substances. 6pp

UNEP. 2006. UNEP GEF PIR FY 2008. Project for the phase out of ozone-depleting substances (merged Institutional Strengthening and Training components). 34pp

UNEP. 2008. UNEP GEF PIR FY 2008. Project for the phase out of ozone-depleting substances (merged Institutional Strengthening and Training components). 27pp

UNOPS. 2002. Certificate of completion for project KAZ/00/G36: Establishment of a National Halon Management Programme including setting up of a centralised halon 1301 / 1211 and 2402 recovery / recycling and storage facility. 11pp

UNOPS. 2006. Certificate of completion for project KAZ/00/G35: Replacement of CFC-113 in the cleaning of oxygen manufacturing equipment at Pavlodar. 7pp

UNOPS. 2006. Contracting the services of the Special Research Centre for Fire Security and Civil Defense of the Republic of Kazakhstan under the National Halon Management Project. 8pp

Veenendaal, B. 2004. Final implementation report. Terminal umbrella project. Conversion from CFC-11 to water-based technology in the manufacture of rigid polyurethane foam for thermal insulation in Kazakhstan. UNDP Consultant Report. 8pp

Veenendaal, B. 2005. Final implementation report. Terminal umbrella project. Elimination of the remaining uses of CFC-11 through LIA technology in the manufacture of flexible polyurethane foam for comfort applications in Kazakhstan. UNDP Consultant Report. 12pp

Veenendaal, B. 2007. Back to office report. Attendance of an ODS workshop in Astana Kazakhstan on 11 November 2005. UNDP Consultant Report. 7pp

Veenendaal, B. 2007. Back to office report. Mission to close all UNDP phase out projects in Kazakhstan. UNDP Consultant Report. 3pp

LATVIA

Anon. 2009. Latvian Refrigeration Engineers Association – Description and Mandate. Machine translation from Latvian to English. 13pp.

Anon. 2009. Ozone Layer Protection in Latvia. Website www.metio.lv/public/28977.html

GEF. 1995. Proposal for the phase out of ozone-depleting substances in Latvia. 14pp

Luter. 2009. Technology for recycling. 8pp.

Ozone Secretariat. 2006. Decisions related to compliance with the Montreal Protocol by Latvia. Handbook for the Montreal Protocol on Substances that Deplete the Ozone Layer. Decisions X/25, IX/30, and VIII/23. 7th Edition.

Ozone Secretariat. 2009. ODS consumption Latvia for: Annex A Group 1, Annex A Group II, Annex B Group I, Annex B Group II, Annex B Group III, Annex C Group I, Annex C Group II, Annex C Group III, and Annex E Group 1. ODS Data Centre. 1 pp summary sheet.

Ritols. 2009. Insulative materials brochure. 4pp.

State Environmental Service. 2009. Forms to be completed for ODS and F-gas recovered, regenerated and destroyed, and amount remaining on 31 December each year. Machine translation from Latvian to English. 2 pp.

UNDP. 2003. Latvia Country Programme, and implementation status. 5pp.

UNEP. 2005. FT05 GEF Annual Portfolio Review. UNEP 16pp.

UNEP. 2007. Format for Terminal Report: Institutional Strengthening Latvia. 14pp.

LITHUANIA

Adams, KM, Hummel, KE, Nelson, TP and SL Wevill. 1991. Project Summary: *Manual for Non-CFC Aerosol Packaging: Conversion from CFC to Hydrocarbon Propellants.* EPA/600/S2-91/056. 8pp.

Aliyev, M. 2001. UNOPS Mission Report to Lithuania, Latvia, Estonia under the Montreal Protocol / GEF Ozone Programme. 7pp.

Anon. 1995. FY05 GEF Annual Portfolio Review. Individual Project Implementation Report. UNEP. 20 pp.

Anon. 1995. Project Implementation Report - Lithuania Country Programme. UNDP. MPU 2336 LITHUANIA RER 95 G33 5pp.

Anon. 1996? Proposal for Review: Republic of Lithuania Phase-Out of Ozone Depleting Substances. Sub-project summaries. Global Environmental Facility. 16pp.

Anon. 2003. Processing Requirements for Ozone-Depleting Substances. Order No 338. Machine translation of Lithuanian legislation. 12pp.

Anon. 2003. Project Implementation Report – 2003 -- Lithuania Country Programme. UNDP. 6pp.

Anon. 2006. UNEP GEF PIR (Final) FY 06, for the period 1 July 2005 to 30 June 2006. GF/2110-99-02– Lithuania: Institutional Strengthening for the Implementation of the Montreal Protocol in Lithuania. 42 pp.

Anon. 2008. Report of the Republic of Lithuania on Research, Development and Public Awareness and Exchange of Information. Submitted to the Montreal Protocol in support of Article 9. 5 pp.

Anon. 2009. Description of the National Refrigeration Association (Lithuania). Machine translation from website. 12 pp.

MLF. 2000. Desk study on compressor projects. UNEP/OzL.Pro/ExCom/31/17. 7pp.

MLF. 2000. Final Report on the 1999 Evaluation of Refrigeration Projects and Draft Follow-Up Action Plan. UNEP/OzL.Pro/ExCom/30/5. 9pp.

MLF. 2001. Evaluation of completed compressor projects in China. UNEP/OzL.Pro/ExCom/34/17. 20pp.

Ozone Secretariat. 2006. Decisions related to compliance with the Montreal Protocol by Lithuania. Handbook for the Montreal Protocol on Substances that Deplete the Ozone Layer. Decisions X/25, IX/30, and VIII/23. 7th Edition.

Ozone Secretariat. 2009. ODS consumption Lithuania for: Annex A Group 1, Annex A Group II, Annex B Group I, Annex B Group II, Annex B Group III, Annex C Group I, Annex C Group II, Annex C Group III, and Annex E Group 1. ODS Data Centre. 1 pp summary sheet.

Teriosina, M. 2008. Annex 6: Terminal [UNEP] Report. Pers. Comm. 23pp.

Teriosina, M. 2009. Data on the recovery of ODS at servicing centres in Lithuania. Pers. Comm. 5pp.

Teriosina, M. 2009. Data on the use of halon on ships. Pers. Comm. 4pp.

POLAND

European Commission. 2009. European Community Management Strategy for the Phase Out of Critical Uses of Methyl Bromide. Updated annually for DG ENV by Touchdown Consulting Brussels. 80 pp.

GEF. 2003. Programme Development Facility (PDF) Block B Request. UNEP. 41 pp.

Ozone Secretariat. 2006. Decisions related to compliance with the Montreal Protocol by Poland. Handbook for the Montreal Protocol on Substances that Deplete the Ozone Layer. Decisions X/25, IX/30, and VIII/23. 7th Edition.

Ozone Secretariat. 2009. ODS consumption Poland for: Annex A Group 1, Annex A Group II, Annex B Group I, Annex B Group II, Annex B Group III, Annex C Group I, Annex C Group II, Annex C Group III, and Annex E Group 1. ODS Data Centre. 1 pp summary sheet.

PNOS. 2009. Website description of the activities of the PNOS Seed Company. 1pp.

Poland. 2009. Work of the ozone layer and climate protection unit. 1 pp.

UNDP. 2003. Total Sector Methyl Bromide Phase Out in Countries with Economies in Transition. GEF – UNDP Project Document. 29 pp.

UNEP. 1995. Report of the VII MOP. UNEP/OzL.Pro.7/12. Essential Use Nominations. Comments by Poland.

UNEP. 2006. GEF Full-sized Project "Total Sector Methyl Bromide Phase Out in CEITs – On to a successful methyl bromide total phase out !". Report of UNEP/UNDP GEF Regional Workshop. 45pp.

UNEP. 2007. UNEP GEF PIR FY 2007. For the period 1 July 2006 to 30 June 2007. 41 pp.

UNEP. 2008. UNEP GEF PIR FY 2008 Review 1. For the period 1 July 2007 to 30 June 2008. 50 pp.

UNEP. 2009. Appendix D to the Terminal Report of the GEF Project: "Total Phase Out of methyl bromide in CEITs: Poland". 9pp.

UNEP. 2009. Final Project Report: "Total Phase Out of methyl bromide in CEITs: Poland". 10pp.

TAJIKISTAN

Anon. 1999. Ministry for the Protection of Natural Resources. Country Programme for Phasing Out Ozone Depleting Substances. pp44.

GEF. 1999. Medium-Sized Project Brief. Tajikistan: Programme for Phasing out Ozone Depleting Substances. pp23.

GEF. 2006. Project ID 3185. Continued Institutional Strengthening Support for CEITs to meet the obligations of the Montreal Protocol in Kazakhstan, Tajikistan, Uzbekistan and Azerbaijan.

Khalil, A. 1999. Republic of Tajikistan. Refrigerant Management Plan. 10pp. Prepared for UNDP. 10pp.

Ozone Secretariat. Recommendations of the Implementation Committee related to compliance of Tajikistan with the Montreal Protocol. Data Centre.

Ozone Secretariat. 2006. Decisions related to compliance with the Montreal Protocol by Tajikistan. Handbook for the Montreal Protocol on Substances that Deplete the Ozone Layer.

UNDP. 1999. Tajikistan. Sub-Project. Complete phase out of CFCs in manufacturing of domestic refrigerators at Pamir. 15pp.

UNDP. 1999. Tajikistan. Sub-Project. National programme for recovery and recycling of ODS refrigerants. 12p.

UNDP. 2003. Project Implementation Report: Tajikistan Country Programme. 6pp.

UNEP. 2006. GEF PIR (1 July 2005 to 30 June 2006) GF/4040-00-23–Tajikistan: Institutional Strengthening ad Capacity Building – Establishment of an Ozone Office and Training for Customs Officers and Refrigeration Technicians. GF/4040-02-03 Tajikistan: Phasing out Ozone Depleting Substances (ODS) (Training Component). 33pp.

UNEP. 1999. Tajikistan. Sub-Project. Institutional Strengthening and Capacity Building- Establishing of a National Ozone Office. 5pp.

UNEP. 1999. Tajikistan. Sub-Project. Training of trainers for use of ODS-free refrigerants, including training of custom officers. 5pp.

TURKMENSTAN

Anon. 1998. UNDP-UNEP Project Brief. Turkmenistan: Country Programme for Phasing out Ozone Depleting Substances. 16pp.

Anon. 2005. UNDP-UNEP Final Report on the ODS Phase out Projects in Turkmenistan.10pp.

Anon. 2008. Ministry of Nature Protection. Update of the National ODS Phase out Programme. Prepared with assistance from UNEP. 40pp.

GEF. 2005. GEF EO Ozone Impact Evaluation Project Review. 4pp.

Ozone Secretariat. Recommendations of the Implementation Committee related to compliance of Turkmenistan with the Montreal Protocol. Data Centre.

Ozone Secretariat. 2006. Decisions related to compliance with the Montreal Protocol by Turkmenistan. Handbook for the Montreal Protocol on Substances that Deplete the Ozone Layer.

UNDP. 2004. Project Implementation Report: Turkmenistan Country Programme. MPU 2356 REP9 56 G44. 5pp

UNDP. 1998. Refrigeration Management Plan. 9pp.

UNDP. 1998. Turkmenistan. Sub-Project. Implementation of a National Programme for Recovery & Recycling of Refrigerants. 14pp

UNEP. 2004. Individual Project Implementation Review Report. GF/2110-99-07– IS for the Implementation of the Montreal Protocol in Turkmenistan; Turkmenistan: phasing out ozone depleting substances (training component. Status of Achievement as of 30 June 2005. 20pp.

UNEP. 2004. UNEP DTIE and DGEF. Workshop Report. Workshop on Management of GEF-funded Ozone Project. Paris, France, 5-7 April 2004. 24 p.

UNEP. 2008. Small-scale Funding Agreement between UNEP and Ministry of Nature Protection of Turkmenistan. Signed on 18 July 2008. 10pp.

UZBEKISTAN

Ozone Secretariat. 2006. Decisions related to compliance with the Montreal Protocol by Uzbekistan. Handbook for the Montreal Protocol on Substances that Deplete the Ozone Layer. Decisions X/25, IX/30, and VIII/23. 7th Edition.

Ozone Secretariat. 2009. ODS consumption Uzbekistan for: Annex A Group 1, Annex A Group II, Annex B Group I, Annex B Group II, Annex B Group III, Annex C Group I, Annex C Group II, Annex C Group III, and Annex E Group 1. ODS Data Centre. 1 pp summary sheet.

SCNP. 2000. Report of the National Consultant on the National Programme on Recovery and Recycling of CFC-12 in the Republic of Uzbekistan. 7pp.

SCNP. 2001. Final Table on the Effectiveness of the use of Recovery and Recycling equipment for the recovery and recycling of CFC-12 and HCFC-22 in the Republic of Uzbekistan. 3pp.

SCNP. 2001. Report of the National Consultant F.R. Saydiev on the Project National Programme on Recovery and Recycling of CFC-12 in the Republic of Uzbekistan for a period from 01.06.2001 to 31.08.2001. 14pp.

SCNP. 2002. Implementation of a National Programme for Recovery and Recycling of refrigerants. 21pp.

SCNP. 2003. Implementation of a National Programme for Recovery and Recycling Project. Machine translation of 23 PowerPoint slides. SNCP.

SCNP. 2003. The process of destruction of CFC-12 in the Republic of Uzbekistan. Machine translation from Russian. 10pp.

SCNP. 2009. Illegally imported ODS detained by the State Customs Committee of the Republic of Uzbekistan for the period 2007-2008. Summary Table. 5pp.

SCNP. 2009. Quantities of ODS recovered and recycled for the period 2000 to 2008. State Committee for Nature Protection. 1pp.

SCNP. 2009. Request for assistance for revising HCFC import quotas. 8pp.

SCNP. 2009. The distribution of the equipment for the recovery and recycling, by region as a 01.01.2009. SNCP. 4pp.

Sherimbetov, HS. 2002. Value the National Programme for Recovery and Recycling of refrigerants. Opinion of the Chair of the State Committee for Nature Protection. 2pp.

SINO. 1999. Discontinued use of CFC domestic production of refrigerators at SINO. Machine translation from Russian of 19 PowerPoint slides. SINO Production Facility, Samarkand.

SINO. 2007. Report on non-investment project training activity – Customs officers. Annex IV. 23pp

SINO. 2009. Production of domestic refrigerators at SINO for the period 2003 - 2008. Machine translation from Russian of table of models produced per year. SINO Production Facility, Samarkand.

SNCP. 2001. Summary of nomination for the essential uses of halon to be used by TAPC. 6pp

SNCP. 2003. Letter to the Montreal Protocol requesting essential uses of halon. 1pp

SNCP. 2005. Improvement of the control of import and export of ODS and products containing ODS in the Republic of Uzbekistan. 1pp.

SNCP. 2007. List of teachers for implementation of II Train the technicians phase of good practices in refrigeration. 3pp

SNCP. 2007. Report on Non-Investment Training Activity. Training of good practices in refrigeration – Annex IV. 10pp

SNCP. 2007. Training of good practices in refrigeration – attendees. 5pp

SNCP. 2008. The list of organisations [and numbers trained] presented the applications for training on phase II: Good practices in refrigeration. 1 pp.

SNCP. 2008. The list of organisations [and numbers trained] presented the applications for training on phase II: Good practices in refrigeration. 1 pp.

SNCP. 2009. Interception of illegal trade in ODS. Machine translation from Russian of 35 PowerPoint slides. SINO Production Facility, Samarkand.

SNCP. A schedule of seminars for the training customs officers (second phase) with the participation of territorial subdivisions of the SCNP. 1pp.

State Customs Committee. Unknown date. Assessment Questionnaire [on performance of trainees after training on ODS]. 1 pp

Tashkent Technical University. 2009. Working agenda training for professional engineers-refrigerating machinery. Machine translation from Russian. 5pp.

UNDP. 1998. Conversion of CFC-12 appliance manufacturing to HFC-134a at Sino. 6 pp.

UNDP. 1999. Project Document on the Implementation of a National Programme for Recovery and Recycling of refrigerants. 18 pp

UNDP. 2002. Letter to Sino about project delays. 2 pp.

UNEP. 2001. Appendix 3: Format for half-yearly operative progress report as of July 2001. State Committee for Nature Protection. 7pp.

UNEP. 2002. Appendix 3: Format for half-yearly operative progress report as of July 2002. State Committee for Nature Protection. 8pp.

UNEP. 2003. Project Implementation Report. PIR 2003 Final. 8pp

UNEP. 2005. Appendix 3: Format for half-yearly operative progress report as of July 2005. State Committee for Nature Protection. 7pp.

UNEP. 2006. Appendix 3: Format for half-yearly operative progress report as of July 2006. State Committee for Nature Protection. 7pp.

UNEP. 2008. Appendix 6: Format for terminal report on the training of customs officers. State Committee for Nature Protection. 6pp.

UNEP. 2008. Appendix 6: Format for terminal report on the training of good practices in refrigeration. State Committee for Nature Protection. 8pp.

Blank page for double-sided printing

Annex 5 Interviewees

Discussions were held with personnel from the following organisations and countries, including:

NAME	AFFILIATION
ORGANISATIONS	
Mr Shende M. Rajendra	Head, Ozone Action Branch, UNEP DTIE, Paris
Ms Christine Wellington-Moore	UNEP Task Manager Ozone/POPs UNEP DGEF/RONA, Washington DC
Dr Suely M. Carvalho	Chief, Montreal Protocol/Chemicals Unit Environment & Energy Group, BDP, UNDP, New York
Mr Jacques Van Engel	UNDP Senior Programme Specialist, Montreal Protocol/Chemicals Unit, New York
Mr Laurent Granier	Coordinator, Chemicals Cluster, Global Environment Facility, Washington DC
Dr David Todd	Evaluation officer, Global Environment Facility Evaluation Office, Washington DC
Dr Lee Alexander Risby	Evaluation officer, Global Environment Facility Evaluation Office, Kanton Zug
Mr Ajiniyaz Reimov	UNDP Task Manager [for Kazakhstan projects in the past] UNDP, Bratislava
Mrs Maria Nolan	Chief, UN Multilateral Fund Secretariat, Montreal
Mr Eduardo Ganem	Senior Programme Management Officer, UN Multilateral Fund Secretariat, Montreal
Mr Maksim Surkov	Programme Specialist, Montreal Protocol/Chemicals Unit, Environment & Energy Group, BDP, UNDP, New York
Mr Rick Cooke	Consultant, Man-West Environmental Group, Alberta, Canada
Mr Zharas Takenov	UNDP officer Kyrgyzstan, but previously UNDP in Kazakhstan until 2004
ARMENIA	
Mr Simon Papyan	First Deputy Minister of Nature Protection, Ministry of Nature Protection, Yerevan
Ms Asya Muradyan	Ozone Focal Point, Head of Land and Atmosphere Protection Division, Department of Environmental Protection, Ministry of Nature Protection, Yerevan
Ms Liana Ghahramanyan	Project Assistant, National Ozone Unit, Ministry of Nature Protection, Yerevan
Ms Armine Astsatryan	Secretary, National Ozone Unit, Ministry of Nature Protection, Yerevan,

NAME	AFFILIATION
	Armenia
Mr Radik Yepremyan	Head of the Refrigeration Association, Yerevan
Mr Gagik Karyan	Chief, Division of Advancement of Customs Services, State Customs Committee, Yerevan
Ms Consuelo Vidal	UN Resident Coordinator, UNDP Resident Representative, Yerevan
Mr Armen Martirosyan	Portfolio Analyst, UNDP, Yerevan
Mr Aram Khachatryan	President, "SAGA" Ltd., Yerevan
Mr Andranik Harutyunyan	Chief Engineer, SAGA" Ltd., Yerevan
Mr Karen Khachatryan	President, Yerevan Household Chemistry Plant, Yerevan
Mr Karapet Afrikyan	Director, "Daronik" LLC, Yerevan
Mr Alik Melkumyan	Artek Servicing, Recycling, Retailing Center, Yerevan
Mr Samvel Danilyan	Entrepreneur, Servicing workshop, Artashat
Ms Amalia Hambartsumyan	President, "KHAZER" Ecological and Cultural NGO, Yerevan
AZERBAIJAN	
Mr Imran Abdulov	National coordinator, Deputy Head of the Department of Environmental Policy and Environment Protection, Ministry of Ecology and Natural Resources, Baku
Mr Maharram Mehtiyev	Former National Ozone Coordinator, Baku
Dr. Gulmali Suleymanov	Director, Centre on Climate Change and Ozone, Department of Meteorology Ministry of Ecology and Natural Resources, Baku
Mr Elvin Safarov	Head, Ozone Branch, Centre on Climate Change and Ozone, Department of Meteorology, Ministry of Ecology and Natural Resources, Baku
Mr Anar Mehtiev	Head, Greenhouse Inventory Branch, Centre on Climate Change and Ozone, Department of Meteorology, Ministry of Ecology and Natural Resources, Baku
Mrs. Mekhriban Alizadah	Head, Central Laboratory, State Customs Committee, Baku
Mr Rahib Mammedov	Senior Manager, TITAN Group, Baku
BULGARIA	
Mr Ivan Angelo	Head, Global Atmospheric Processes Dept, Ministry of Environment, Sofia
Ms Irina Sarashka	Senior Expert, Global Atmospheric Processes Dept, Ministry of Environment, Sofia
Prof Sotyka Masheva	Director, Maritsa Vegetable Crops Research Institute, Plovdiv
Mr M. Todorov Snr	Yandi company, Plovdiv
Mr Todorov Jnr	Yandi company, Plovdiv

NAME	AFFILIATION
Mr Yordon Spasov	Fitozashita Company, Plovdiv
Prof Georgi Neshev	Professor and Vice-Rector, Agricultural University, Plovdiv
Mrs Villi Yovkova	Regional Plant Protection Service, Plovdiv
Mr Plamen Dragov	Manager, Coolstar, Varna
Mrs Vyara Bancheva	Import-Export Manager, Coolstar, Varna
Mrs Bogdanova	Engineer, MRAZ
Mr Krastyu Krastev	BRIST Refrigerated food units, Breznik
Dr Peter Vassilev	Technical Director, Institute of Refrigeration and Air-Conditioning, Sofia
ESTONIA	
Mrs Valentina Laius	Expert, Environment Management and Technology Dept, Tallinn
Dr Rein Raudsep	General Director, Environment Management and Technology Dept, Tallinn
Mr Viktor Grigorjev	Director, Air Quality and Radioactivity Bureau, Environment Management and Technology Dept, Tallinn
Mr Jiljo Kaul	Director, Refrigeration Association, Tallinn
Mr Inari Truumea	Head of Ozone Office, Estonian Environmental Research Centre, Tallinn
Mr Elvo Admann	Head, Refrigeration Dept, Estonian Maritime Academy, Tallinn
Mr Margus Kort	Chairman of the Board, Estonian Environmental Research Centre, Tallinn
Ms Ene Kriis	Projects Leader and Programme officer for the NOU, Estonian Environmental Research Centre, Tallinn
Mr Pavel Belov	Manager, Halon Recycling Facility, Tallinn
HUNGARY	
Mr Endre Palos	Consultant to the Ministry of Environment, Budapest
Mr Robert Toth	Senior Counsellor, Section of Air, Noise and Traffic, Dept. for Environmental Development , Ministry of Environment and Water, Budapest
Mr Gyula Belai	Managing Directory, Zephyr Commercial and Servicing Company, Kecskemet
Mr Akos Zentai	Technical advisor and general manager, Arpad Biokontroll, Szentes
Mr Laslo Kovacs	Director, Arpad, Szentes
Mr Ledo Ferenc	Director, South Garden Producer Organisation, Szentes
Mr Attila Zoltan	Secretary General, Hungarian and Air Conditioning Association, Budapest
Mr Kovacs Keve	Electronics Engineer, Hitelap printed circuit boards, Budapest
Mr Osz Tibor	Director, Fajro Automation and Fire Protection Equipment, Budapest
Ms Ibolya Visegradi	Executive Assistant, Fajro Automation and Fire Protection Equipment, Budapest
Mr Kiss Csaba	Manager, Fajro Automation and Fire Protection Equipment, Budapest
Mr Ziffer Otto	Manager, Rutitex Dry Cleaning Services, Budapest
Mr Gyorgy Fazekas	Director, Metisol sandwich panels, Budapest
Mr Andras Globenetz	Director, Tisza Shoe Company, Martfu
Dr Peter Simko	Director, Automobil propellant cans, Budapest

NAME	AFFILIATION
Mrs Nagy Benko	Assistant to the Mr Jozsef Forgo, Metalucon sandwich panels
Mr Csaba Otvos	Director, Mediroll medical products, Debrecen
Mr Stephen Cseke	Manager, Mediroll medical products, Debrecen
Mr Thomas Farkas	Hajdusagi Iparmuvek Company (insulated hot water tanks), Teglas
Mrs Eva Kavai	Sales and service, Frigolux refrigerator manufacturer, Csongrad
KAZAKHSTAN	
Mr Alexandr G. Bragin	Director, Dept of Legal and Security International Cooperation, Ministry of Envvironmental Protection, Astana
Mrs Valentina Kryukova	Head, Climate Change Coordination Department, Astana
Mr Syrym Nurgaliyev	Project Assistant, Climate Change Coordination Department, Astana
Mr Vladmir Fomin	Director, Trade Market, Almaty
Mr Denis Kuznetsov	General Representative, Logstor (associated in the past with Trade Market), Almaty
Mr Aralov Askar	Director, Fire Service Department, Almaty
Prof Ruslan Djumagaliev	Deputy Director, Social Scientific and Technical Centre for Fire Safety and Civil Defense, Almaty
Mr Mikkheil Pomorov	Director, Polair, Almaty
Mr Valery Rjasna	Combi Technocentre, Almaty
Mr Artur Akhmetov	Director, Kaustic, Pavlodar
Mr Igor Sukhonosenko	Director, Oasis Engineering Group, Pavlodar
Mrs Dosmagulova	Torg Teknik, Director, product sales, Pavlodar
Ms Kymbat Keshubayeva	Project Expert, Climate Change Coordination Centre, Astana
Mr Oleg Bulakh	Mechanic, Auto Klimat, Astana
Mr Marat Uslimov	Specialist, Department of Management of Customs Control, Astana
Mr Ruslan Jumagulov	Chief Officer, Department of Management of Customs Control, Astana
Ms Inkar Kadyrzhanova	Leader, UNDP Country Office, Astana
Ms Viktoria Balgazina	Programme Associate, UNDP Country Office, Astana
Ms Bibigul Tazhina	Head Expert Interstate Cooperation and Ecological Conventions Ministry of Environmental Protection, Astana
Mr Yuri Oborovski	Head of oxygen and nitrogen dept., Kaustic, Pavlodar
LATVIA	
Armands Plate	Head of Division, Dept of Environmental Protection, Technology Unit, Ministry of the Environment, Riga
Ms Ilze Prūse	Head of Pilot Projects Implementation Division, Climate and Renewable Energy Department, Ministry of the Environment, Riga
Ms Inna Sharanina	President, Latvian Refrigeration Engineers Association, Riga
Mr Andris Krupniks	Trainer, Latvian Refrigeration Engineers Association, Riga
Dr Judite Dipane	Head, Pollution Integrated Permits Division, State Environmental Service, Riga

NAME	AFFILIATION
Mr Andris Roska	Director, Pollution Integrated Permits Division, State Environmental Service, Riga
Dr Ukis Cabulis	Director, Ritols Foam Spray, Riga
Mr July Zemnieks	Director, Revers Refrigeration Equipment, Riga
Dr Andris Madelis	Director, Kvadro aerosol products, Riga
Mr Jevgenijs Lukins	State Plant Protection Service, Riga
Mr Agris Bokums	Deputy Director Plant Quarantine Dept., State Plant Protection Service, Riga
LITHUANIA	
Ms Marija Teriosina	National Ozone Coordinator and Head, Chemicals Division, Ministry of Environment, Vilnius
Ms Varvara Daubariene	Chief Desk Officer of Chemicals Division, Ministry of Environment, Vilnius
Ms Daina Norkiene	Project Management Group Leader, Snaige, Alytus
Mr Laiumtis Jakubonis	Production Manager, Aerosol Baltija UAB, Vilnius
Mrs Leonas Kanopka	Director, National Refrigeration Association, Vilnius
Mr Arturas Klemanas	General Director, Oruva compressor producer, Mazekiiai
POLAND	
Mrs Maria Klikocka	Head of the Division, Climate Change and Ecological Conventions, Ministry of the Environment, Warsaw
Mr Ryszard Purski	Counsellor to the Minister, Division of Climate Change and Ecological Conventions, Ministry of the Environment, Warsaw
Prof Janusz Kozakiewicz	Head, Ozone Layer and Climate Protection Unit, Industrial Chemistry Research Institute, Warsaw
Ms Jadwiga Makosa	Project Administrator, Ozone Layer and Climate Protection Unit, Industrial Chemistry Research Institute, Warsaw
Mr Rafat Szymanksi	Senior Inspector, Division of Climate Change and Ecological Conventions, Ministry of the Environment, Warsaw
Mr Janusz Przedpelski	Technological Expert, Prozon ODS recovery, Warsaw
Mr Michal Dobrzynski	Director, Prozon ODS recovery, Warsaw
Mr Krzysztof Lusawa	Kierownik Oddziatu Aerozoli, Warsaw
Mr Stanislaw Oboza	Director, Solfum, Rabien
Proj Jan Nawrot	Institute of Plant Protection, Dept of Entomology, Poznan
Prof Czeslaw Slusarski	National soil specialist, Institute of Vegetable Crops, Skienriewice
Prof Stanislaw Ignatowicz	Post-harvest Regional Specialist, Agricultural University of Warsaw, Warsaw
Mr Jaroszewski	Deputy Chief of the Production Dept, PNOS Seed Company, Warsaw
TAJIKISATAN	
Dr Abdukarim Kurbanov	Head, National Ozone Unit, Hydrometeorological Agency, State Committee for Environment and Forestry, Dushanbe
MrTimur Nazarov	Head, Department of International Relations, Environment Protection

NAME	AFFILIATION
	Committee, Cabinet of Ministers, Dushanbe
Mr Khurshed Khusaynov	Deputy Head, National Ozone Unit, Head of Refrigeration Assoc., Dushanbe
MrNigmat Rakhmatov	First Deputy Head, State Customs Committee, Dushanbe
MrRustam Abdukolomov	Deputy Head, Legal Department, State Customs Committee, Dushanbe
Mr Beg Mahmagaliev	Director, Hydrometeorological Agency, State Comm. for Env. & Forestry, Dushanbe
Mr Bahtiyar Zhabarov	Chief Engineer, "Rembyttechnica" Refrigeration Servicing Center, Dushanbe
Mr Faruh Zakhirov	Director General, "Rembyttechnica" Refrigeration Servicing Center, Dushanbe
Mr Ibodulo Mirov	Fmr Director General, "Pamir" Domestic Ref. Manufacturing Plant, Dushanbe
TURKMENISTAN	
Mr Mahtumkuli Akmuradov	Minister, Ministry of Nature Protection, Ashgabat
Mr Vladimir Verveda	Coordinator, National Ozone Unit, Ashgabat
Ms Gulshirin Jorayeva	Accountant, National Ozone Unit, Ashgabat
Ms Marianna Pursiyanova	Administrative Assistant, National Ozone Unit, Ashgabat
Mr . Ashyr Agaev	Head, Standards Department, State Standards Inspectorate, Ashgabat
Mr Myrat Purliev	Senior Inspector, Certification Department, State Standards Inspectorate, Ashgabat
Mr Shukhrat Muradov	Senior Inspector, Certification Department, State Standards Inspectorate, Ashgabat
Mr Anatoly Chopanov	Director, State Refrigeration Servicing Company, Ministry of Trade, Ashgabat
Mr Eduard Danilianz	Team Leader, State Refrigeration Servicing Company, Ministry of Trade, Ashgabat
Mr Sergey Nikiforenko	Servicing Technician, State Refrigeration Servicing Company, Ministry of Trade, Ashgabat
UZBEKISTAN	
Mr Rakhmatulla Khabirov	Acting first deputy Chairman of the State Committee for Nature Protection, Ministry of Environment, Tashkent
Mrs Nadezhda Dotsenko	National Coordinator of Ozone Unit, State Committee for Nature Protection, Ministry of Environment, Tashkent
Mr Farkhat Saydiyev	Project Officer National Ozone Unit, State Committee for Nature Protection, Ministry of Environment, Tashkent
Mrs Ella Tkhay	Project Accountant, National Ozone Unit, State Committee for Nature Protection, Ministry of Environment, Tashkent
Mr Andrey Makarov	Director, Savdotekhnikamontazh ODS recovery and recycling operations,

NAME	AFFILIATION
	Tashkent
Mr Asametdinov Shakhobinnin	Master of refigerating sector, Savdotekhnikamontazh, Taskkent
Mr Rasheed	Chief Engineer, Shark Shaboda ODS recovery and recycling operations, Tashkent
Dr Karimov	Head of Dept Technological Machines and Equipment, Tashkent State Polytechnic University, Tashkent
A Muminov	Head of Laboratory, Tashkent State Polytechnic University, Tashkent
	Chief Engineer, Yo'L REFTRANS, ODS recovery and recycling operations
	Manager, Kerio Service ODS recovery and recycling operations, Samarkand
	Manager, Savodo Teknika ODS recovery and recycling operations, Samarkand
Mr Utkam Ablakulov	Deputy Director on Technical Questions Candidate technical sciences, SINO Refrigeration Production Facility, Samarkand
Mr Otabek Nazrullayev	Director, SINO Refrigeration Production Facility, Samarkand
Mr A Abduganiyev	Head of Central Customs Laboratory, Tashkent
Mr A. Sayidev	Head of Dept of Information Technologies, Customs Service, Tashkent
Mr Ziyodullo Parpiev	Leader, Adviser Economist, UNDP Tashkent
Mr Farhod Maksudov	Environmental specialist and adviser, UNDP, Tashkent
Mr Oybek Shagazotov	Investment Department of the Ministry of Foreign and Economic Relations and Trade, Tashkent