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Report No: 22341

IMPLEMENTATION COMPLETION REPORT
(TF-28954)

ON A

GLOBAL ENVIRONMENT FACILITY

GRANT

IN THE AMOUNT OF SDRs 4.4 MILLION (US$ 6.214 MILLION EQUIVALENT)

TO THE

REPUBLIC OF POLAND

FOR

OZONE DEPLETING SUBSTANCES PHASEOUT

06/13/2001

CURRENCY EQUIVALENTS

(Exchange Rate Effective April 2001)

Currency Unit = PLN
PLN 1 = US$ 0.23
US$ 1 = PLN 4.4

FISCAL YEAR
January 1 to December 31

ABBREVIATIONS AND ACRONYMS

BCG	Bank Consulting Guidelines
CEE	Central and Eastern Europe
CFC	Chlorofluorocarbon
CP	Country Program
DC	Direct Contracting
FA	Financial Agent
GEF	Global Environment Facility
GET	Global Environment Trust Fund
GOP	Government of Poland
HCFC	Hydrochlorofluorocarbon
HFC	Hydrofluorocarbon
IA	Implementing Agency
ICB	International Competitive Bidding
IDA	Industrial Development Agency of Poland
IS	International Shopping Procedures
LIB	Limited International Bidding
MFMP	Multilateral Fund for the Implementation of the Montreal Protocol
MOE	Ministry of Economy
MOEPNRF	Ministry of Environmental Protection, Natural Resources and Forestry
MOF	Ministry of Finance
MP	Montreal Protocol on Substances that Deplete the Ozone Layer
NBF	Not Bank Financed
NCB	National Competitive Bidding
NS	National Shopping Procedures
OD	Operational Directive
ODP	Ozone Depleting Potential
ODS	Ozone Depleting Substances
OLPU	Ozone Layer Protection Unit
OORG	Ozone Operations Resource Group
PAA	Project Administration Agreement
PCP	Prudent Commercial Practices
PE	Participating Enterprise
PIP	Project Implementation Plan
PPL	Polish Procurement Law
SDR	Special Drawing Right
SFSH	State Fire Service Headquarters
SOE	Statement of Expenditures
STAP	Scientific and Technical Advisory Panel
UNDP	United Nations Development Program
UNEP	United Nations Environment Program
US$	United States Dollar
USEPA	United States Environmental Protection Agency
3 R	Recovery, Reclamation and Recycling

Vice President:	Johannes Linn
Country Manager/Director:	Kevin Cleaver
Sector Manager/Director:	Jane Holt
Task Team Leader/Task Manager:	Krisztina Kiss

POLAND
OZONE DEPLETING SUBSTANCES PHASEOUT

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Project ID: P035081	*Project Name:* POLAND OZONE DEPLETING SUBSTANCE PHASEOUT
Team Leader: Krisztina Kiss	*TL Unit:* ECSSD
ICR Type: Core ICR	*Report Date: June 25, 2001*

1. Project Data

Name: POLAND OZONE DEPLETING SUBSTANCE PHASEOUT
L/C/TF Number: TF-28954
Country/Department: POLAND
Region: Europe and Central Asia Region
Sector/subsector: VP - Pollution Control / Waste Management

KEY DATES

			Original	*Revised/Actual*
PCD:	02/01/97	*Effective:*	07/29/97	
Appraisal:	05/02/96	*MTR:*		
Approval:	03/11/97	*Closing:*	12/31/98	04/30/2001

Borrower/Implementing Agency: REPUBLIC OF POLAND/POLISH MINISTRY OF ECONOMY (FORMERLY INDUSTRY AND TRADE)
Other Partners:

STAFF	Current	At Appraisal
Vice President:	Johannes F. Linn	Johannes F. Linn
Country Manager:	Basil G. Kavalsky	
Sector Manager:	Jane E. Holt	Director: Hans J. Apitz
Team Leader at ICR:	Krisztina Kiss	Helmut Schreiber
ICR Primary Author:	Krisztina Kiss	

2. Principal Performance Ratings

(HS=Highly Satisfactory, S=Satisfactory, U=Unsatisfactory, HL=Highly Likely, L=Likely, UN=Unlikely, HUN=Highly Unlikely, HU=Highly Unsatisfactory, H=High, SU=Substantial, M=Modest, N=Negligible)

Outcome: S
Sustainability: L
Institutional Development Impact: SU
Bank Performance: S
Borrower Performance: S

	QAG (if available)	ICR
Quality at Entry:	S	S
Project at Risk at Any Time:	No	

3. Assessment of Development Objective and Design, and of Quality at Entry

3.1 Original Objective:

Background

Poland committed to phase-out Ozone Depleting Substances (ODS), with the signing of the Vienna Convention and Montreal Protocol (MP) and their subsequent London, Copenhagen and Montreal amendments. Poland qualified as an "Article 2" or "non-Article 5" developed country under the MP. As such, Poland is not eligible for financial assistance from the Multilateral Fund for the Implementation of the Montreal Protocol, but is eligible for Global Environment Facility (GEF) financing. A Country Program (CP) for ODS Phaseout was prepared with the support of the United States Environmental Protection Agency (USEPA) and the United Nations Development Program (UNDP) and Polish National Fund for Environmental Protection and Water Management. Poland's annual ODS consumption among relevant user sectors as documented in the CP: refrigeration: 47.7 percent (913.6 ODP tons); aerosols: 32.4 percent (621 ODP tons); foams: 10.8 percent (207 ODP tons); solvent: 1.9 percent (35.5 ODP tons); other: 7.2 percent (138 ODP tons); total: 100 percent (1,916 ODP tons). To help implement a program to phase out the ODS consumption identified in the Country Program the Government of Poland requested financial assistance in the form of grants from the GEF. The Bank, as an implementing agency for GEF, assisted in the preparation and implementation of the ODS phase-out project which comprised a number of sub-projects.

The key milestones of the project are presented below:

Project Preparation Begins (first mission)	-	March 1995
Project Appraised	-	April 1996
GEF Council Approval	-	April 1996
GEF Secretariat Endorsement	-	November 1996
Negotiations	-	July 1996
Board Approval	-	March 1997
Grant Signed	-	June 1997
Grant Effectiveness	-	June 1997
Original Closing Date	-	December, 1998
Revised Closing Date (first extension)	-	June 30, 2000
Revised Closing Date (second extension)	-	October 31, 2000
Revised Closing Date (third extension)	-	April 30, 2001

The main project objective was to assist Poland to effectively meet its obligations with respect to phasing out ODS consumption under the Montreal Protocol, as amended and adjusted. The design of the project and implementation arrangements took into account the grantee's capacity to effectively execute the project. Technical Assistance was provided to ensure that the objectives of the project were met. Also, sustainability of the investments was a significant factor in project design considerations.

Objective

The objective of the project was to assist Poland in carrying out a Country Program to phase out ODS consumption and enable existing users to shift to more ozone friendly technologies. In so doing Poland would be helping to maintain the Earth's ozone shield that protects its inhabitants from UVB sun radiation. This objective was to have been met by: (a) supporting priority sub-projects identified in the Country Program for technology conversion to non-CFC materials; (b) supporting the establishment of a nationwide network for CFC recovery, reclamation, and recycling (3R) operations; and (c) improving the capacity of the Ministry of Environment to manage and oversee the phaseout of ODS in Poland through institutional strengthening. If fully implemented, the project would contribute to the direct phaseout of 914 tons/annum of ODP consumption. Additional of 140 tons/annum of ODP through the 3R scheme and 150 tons/annum of ODP through the conversion of a refrigerator compressor factory to non-ODS technology would be indirectly phased out.

Currently, there is no consumption of CFC in the country, making Poland fully compliant with its obligation regarding this substance, under the Montreal Protocol.

3.2 Revised Objective:

The original project objective was not revised.

3.3 Original Components:

The appraised project consisted of: (i) technology conversion and investment component (six sub-projects in the refrigeration, foam and aerosol sectors); (ii) a recovery, reclamation and recycling (3 R) component (one sub-project); and, (iii) an institutional strengthening and training component (two sub-projects).

Technology Conversion and Investment Component

- **POLAR (Wroclaw)** - Conversion from CFC-11/12 to cyclopentane/134a at the company's refrigerator factory and establishment of CFC-12 recycle network. The sub-project consisted of three parts: i) substitution of CFC-12 refrigerant with HFC-134a in two domestic refrigerators production lines; ii) substitution of CFC-11 foaming agent with cyclopentane in the production of cabinets and doors for domestic refrigeration equipment; and iii) development of a CFC-12 freon recycling network within POLAR's 190 service shops. Implementation was expected to result in the elimination of annual consumption of 50 tons of CFC-12 and 150 tons of CFC-11.

- **ZAMEX (Zagan)** - Conversion from CFC-11 to cyclopentane foaming line for household freezers in the production of rigid polyurethane foam freezer insulation aiming at replacing the replacement of injection machines for suitable ones for use of cyclopentane. Implementation was expected to eliminate annual consumption of 75 tons of CFC-11. CFC-12 refrigeration had been phased out before.

- **Inzynieria (Warsaw)** - Elimination of CFC-11 foaming agent in the production of rigid polyurethane pipe insulation in the production of a range of molded rigid polyurethane foam items, including insulated pipe liners through the conversion of CFC-11 to water/CO2 technology by installing a new high pressure foam blowing machine and modifying molds. The sub-project was expected to phase out 19 tons/annum of CFC-11, based on the 1995 consumption level. Until the completion of a technology change, the firm would continue foaming with CFC-11, stockpiled prior to Poland's ODS phaseout deadline.

- **Metalplast (Oborniki)** - Phaseout of CFC-11 blowing agent in the production of thermal insulation sandwich panels on two continuous laminator links and replace with n-pentane foaming agent. Technology conversion was to have involved foaming line 1 and retrofitting of line 2, including safety equipment to permit foaming with flammable n-pentane. The implementation was expected to have resulted in an annual phaseout of 300 tons of ODP-weighted consumption of CFC-11.

- **POLFA (Warsaw)** - Conversion from CFC-111 and CFC-12 to hydrocarbon based pharmaceutical propellant in the manufacture of dermatological antibiotic medications in aerosol form. The sub-project implementation was to have phased out an annual consumption of 320 tons of ODP, through refitting the pharmaceutical plant, filling the aerosol antibiotics and corticoids to permit the use of a non-ODS propellant mix. -- An Ozone Operations Resource Group (OORG) review had been under way at appraisal and OORG approval – based on the company's evidence of the feasibility of using hydrocarbon-based emulsion in an aerosol. Satisfactory testing and the Ministry of Health's registration approval of the product, as conditions of Sub-Grant Agreement signature, were obtained prior to disbursement.

- **EDA (Poniatowa)** - Retooling of a domestic refrigerator compressor factory to produce HFC-134a instead of CFC-12 and use of hermetic compressors for domestic refrigerators, freezers and milk coolers through retrofitting the production line. Implementation was expected to convert a production line for 500,000 units annually, with an indirect reduction of 150 tons of CFC-12 per year. -- The decision to produce HFC-134a compressors rather than other non-ODS substitutes was dictated by the requirements of EDA's main customer, POLAR (Wroclaw), which had previously opted for HFC-134a refrigerant technology.

Recovery, Reclaim and Recycle (3 R) Component

- **PrOzon (Warsaw)** – Establishment and operation of a nationwide CFC-12 Recovery, Reclamation and Recycle Network with PrOzon, a non-profit foundation for the protection for the ozone layer, established by the two largest refrigerant gas distribution companies. 1600 was to have been equipped with recovery equipment (30% self financed and 70% Sub-grant financed). A central CFC reclamation center and 17 collection/distribution depots was to have been established. Under a sub-component refrigeration, servicemen would be trained in CFC-12 conservation and HCF-134a services procedures by the Refrigeration Center of Krakow (COCH). Annual potential recovery was estimated at 140 MT of ODS, primarily R-12, which would be accounted as indirect phaseout of ODS.

Institutional Strengthening Component

- **State Fire Service Headquarters (Warsaw)** – Training program for the use of non-halon alternatives for fire protection. The objective was to organize and carry out two 3-day training courses to train designers of fire protection systems, specialists in engineering supervision and fire fighting engineers on alternatives to halon systems. A group of potential instructors for future training courses was to have been selected from among the 60 participants. The Sub-project was to have been implemented by the State Fire Service Headquarters in collaboration with the Science and Research Center for Fire Protection. Four experts from the non-profit Halon Alternatives Research Corp. (USA) and two Polish experts would conduct the courses and prepare a training manual.

- **Institutional Strengthening of the Industrial Development Agency (IDA) and the Ozone Layer Protection Unit (OLPU).** – Assist IDA and OLPU to supervise Project implementation. The IDA had been designated by the Ministry of Economy (MOE), to whom it reports, as the implementing agency for the Project, housing the Project Management Unit. The IDA was charged with coordinating project implementation, overseeing procurement and disbursement and supervising all Project activities. The IDA staff was to be responsible for Project administration, supplemented as required by technical, legal and financial experts. As necessary, the OLPU would coordinate ODS phaseout policy, help identify technical consultants to assist in project implementation supervision, and provide support to facilitate cooperation among Government institutions and the consumers of ODS.

3.4 Revised Components:

With the exception of POLFA, EDA/MPW (now EKOPON) and PrOzon, no major re-design of Sub-projects took place during the course of the Project and all other Sub-projects were implemented essentially as designed. The changes on the above project components were as follows:

- **POLFA** - Changes were made to the design of the POLFA Sub-project when the first OORG review rejected the use HFC-134a as a medical aerosol propellant and the Bank's technical expert recommended that HAP should be used instead. This change preceded the final approval of this Sub-project and the signing of the Sub-grant Agreement.

- **MPW/EKOPON** - It was agreed that one piece of machinery would be modified instead of replaced under the Sub-project as there was insufficient money in the budget to cover the cost of a new machine. This was technically acceptable and agreed to fully by the Bank's technical expert. This change did not in any way contribute to the other subsequent difficulties experienced during the implementation of this Sub-project (see sections 4.1 and 5.1)

- **PrOzon** - The initial design of this sub project was based on the assumption that sales of recovery machines to servicemen would cover the running costs of the organization managing the project. This concept proved unworkable. When this became obvious in 1998, it was agreed that some additional funds could be used under the Grant by PrOzon to cover initial

incremental operating costs until the refrigerant recovery and reclaim got under way. This enabled recovery machines to be distributed free of charge to technicians, provided they had participated in the training courses organized under the Sub-project (COCH) and had recovered 50 kg of refrigerant within three months. In the event more recovery machines than originally anticipated were purchased and distributed, and more technicians received training. These actions dramatically increased the participation rate of technicians in the 3 R scheme, which has now become the Project's main success story (see Lessons Learned).

3.5 Quality at Entry:

The Project was not subject to a quality at entry review, therefore ratings or reporting on the QAG process are not available.

There were no technical risks identified with the Project. There were no Project risks identified at entry, since at the time of appraisal, the practice applied for the Czech, Hungarian and Slovenian ODS Phaseout Project was followed, which did not envisage any financial sustainability or bankruptcy problem and the legal documents did not include any clause for the occurrence of such either. After the financial diagnostic of the enterprises had been done, the financial viability of the selected ones was not considered to be a concern, macroeconomic conditions were good. Hence, the subsequent bankruptcies of two participating enterprises, EDA/MPW/EKOPON (Sub-project 6) in January 2000 and Zamex (Sub-project 2) in October 2000 were not foreseen or envisaged at entry.

Implementation Assessment

At first, procurement procedures and contracts were challenging for the PMU and the participating enterprises. The PMU, IDA and OLPU say today that Bank procurement training for the PMU and the participating enterprises at entry was insufficient, therefore contributing to delays in the procurement process during implementation. Often "ad hoc" procurement and project management "training" had to be provided by the Bank during supervision/implementation. The Bank's decision to allow Polish Commercial Practices to be used as the main procurement procedure under the Project speeded up the process and was especially useful for the PrOzon Sub-project. At the start-up phase, the preparation and signatures of all the Sub-grant Agreements (SGAs) and the Project Administration Agreement took a very long time, in spite of the fact that local lawyers were hired under the Grant by the PMU for legal advice and the preparation of these Agreements. The reasons for the delay were: difficulties with getting final agreement of some enterprises on Bank procedures and conditions like auditing; some provisions of the SGAs were not fully in line with Polish law; and some other enterprises intended to get through the SGA negotiations more advantageous financial conditions at the end.

4. Achievement of Objective and Outputs

4.1 Outcome/achievement of objective:

The objectives of the Project have been fully achieved. At completion, all enterprises under the Project have successfully converted to non-ODS technologies and, except for EKOPON and

Zamex, are meeting the non-ODS technology production demand for the market. --The undisbursed balance under the grant was SDR 14,083.42 on May 18 which could be disbursed during the grace period for disbursements by August 31 2001 for eligible expenses done and submitted before the closing date.-- Therefore, the ICR rates the Project as being satisfactorily implemented. Explanation of this rating is presented below.

Achievement of the Country Program Objectives

With assistance from the United States Environmental Protection Agency (USEPA), the United Nations Development Program (UNDP) and Polish National Fund for Environmental Protection and Water Management, Poland prepared a Country Program for ODS phaseout strategy. The Country Program included key policy actions and proposed a phaseout of 1916 ODP tons of ODS as described in Annexes A and B of the Montreal Protocol and based on 1994 consumption levels, through the implementation of identified priority investments in the main sectors of aerosols, foaming, solvents and refrigeration. Other enterprises did not participate in the GEF Project, as they had phased out CFCs before the end of 1995 using their own financial resources. In the solvent and aerosol sectors (excluding medical aerosols) elimination of CFCs had been completed even earlier. In the refrigeration sector, non-ODS use (HFC-134a as refrigerant and cyclopentane as foaming agent) technologies had been implemented at most of the enterprises prior to the Project. Enterprises whose shift to non-ODS technologies involved the highest investment costs became part of the GEF Project. As of the date of this ICR, the target of phasing out all the 1916 ODP tons has been fully met. GEF support was critical in achieving this goal.

Achievement of Project Objectives

The specific objectives of the Project were to contribute to the overall Country Program for targets ODS phase-out by phasing out 914 t/y ODP consumption or 47% of the 1994 (base year) total. Additionally, 140 ODP tons consumption by the refrigeration servicing sector was to be phased out indirectly through establishment of the 3 R scheme, and another 150 ODP tons phased out indirectly through the conversion of a compressor plant to non-ODS technology.

All three of these targets were achieved and, thus the Project's objective has been fully met (Section 4.2.). In addition, the GEF Grant financed the technology conversion that allowed participating enterprises to meet international standards and retain their domestic and export markets; -- except for EDA/MPW and Zamex Companies, which went bankrupt (details and related future operations are described in the next two paragraphs). -- Thus, the Project contributed to global efforts to protect the Ozone Shield and helped Poland meet its obligations under the Montreal Protocol and its amendments.

In the case of EDA/MPW, a new company EKOPON was established to take over its operations in August 2000 by IDA, Poland's restructuring agency with the support of MOE. As IDA is the owner of EKOPON, the Board of IDA brought decisions first on April 27, 2001 to award a loan of US$ 700,000 for five years with two years grace period for investment purposes (buying the necessary buildings, premises, old equipment from the two bankrupt companies, EDA and Compressors Works, and for the rehabilitation and modernization of related infrastructure) and on

May 10 2001 to increase the equity of EKOPON by PLN 1 million needed for the working capital. Thus the equity of EKOPON amounts 1.83 million PLN. As planned today EKOPON could begin full operation with the new equipment financed under the GEF grant in August/September 2001. It is still hoped that the new company will gradually gain back its market. About 60,000 units would be produced until end of 2001 and the company could reach the break-even point during next year and become profitable in two years time according to EKOPON's Business Plan of February 2001. The prospects are good that the equipment financed by GEF will be in full operation in fall 2001.

In October 2000, the Zamex Company domestic refrigeration producer in Zagan too went bankrupt after one and half years' production of about 50,000 units with the new equipment. The main reasons were the loss of markets in the East due to financial crisis and increased competition among producers. The small company lost almost seven million PLN in 1999. A restructuring effort in 2000 proved to be insufficient to save the company. Two tenders for the privatization of the company were launched at end last year but were unsuccessful. Today the Receiver in Bankruptcy, under the supervision of the Judge-Commissioner is responsible for selling the enterprise primarily as a whole. The Ministry of Economy is doing its best to assist the Receiver to find an investor who will put the equipment purchased under the Grant and the factory back into operations. Three bidding processes have been done for selling the company as a whole, the fourth one to sell the production line, as a whole will take place at end of June 2001. The Receiver is in negotiations with a potential Polish investor, difficult to judge, but it is likely that the equipment funded by the Grant will be in operation again.

Environmental Concerns

There were no major environmental concerns associated with the installation or operation of non-ODS technologies and the Bank classified the Project as a category B, requiring limited environmental analysis. Only modest environmental risks were associated with the use of cyclopentane, a flammable substance in the foam sector. In order to mitigate and manage these risks, all Sub-projects followed industrial safety guidelines. In addition, Environmental Impact Assessments, including health and safety plans, were carried out for all Sub-projects in accordance with the Polish Environmental Protection Act. Environmental and safety permits had to be obtained by all the Sub-project enterprises prior to the start of operations with the new equipment and technologies.

Legal and Regulatory Framework Development

The key policy elements of the phaseout strategy and domestic legislation that have been implemented during the Project Period, with some impetus from the institutional strengthening components, are as follows:

- From 1992 through 1996: Government Decrees banned the use of halons in new equipment and ships; introduced mandatory authority permits related to the imports and exports of all ODS; banned trading in ODS with countries that are non-parties to the MP; banned imports of products and equipment containing ODS from countries that are non-parties to the MP;
- In 1997: a Government Decree stipulated that CFCs be treated as hazardous wastes;

- In 1997: a Government Decree banned products and equipment that contain CFCs, HCFCs and halons from being placed on the Polish market;
- In 2001: a Waste Management Act was passed by the Parliament, which qualifies existing ODS in old appliances for recovery, reclamation and recycling purposes as non-hazardous wastes; this Act thus ensures operation of the many cylinder depots and the reclamation center are not subject to several strict restrictions.
- January 2001: a new Act on ODS Management has been drafted and would soon be passed by the Parliament and in force from July 1, 2002. This Act declares venting of CFCs to be an illegal activity and sets high penalties. Back-up regulations of this Act to allow for the proper monitoring and enforcement of this legislation, have also been drafted by the relevant ministries.
- Currently a Product Fee Law is under preparation. Products containing HCFCs will be subject to the Law, but not HFCs or HCs.

Relation to 3R Component

When implemented, both the Waste and the ODS Management Acts as well as the Product Fee Law, will make sustainable operation of 3 R scheme by making venting ODS illegal, the "green cards" for refrigeration servicemen compulsory, create proper penalties, and a framework for enforcement, ensure that ODSs reclamation forms would not be treated as hazardous waste and allow central payments for the storage and incineration of non-reclaimable CFCs.

The current system of ODS Monitoring and in Poland has been built on the one established already in 1994. It is in harmony with the European Union relevant directives. The Ozone Layer Protection Unit (OLPU) in the Industrial Chemistry Research Institute in Warsaw had a key role in the design and establishment of the ODS Monitoring System, which operates effectively today in Poland.

Public Awareness Raising Campaign

A Public Awareness Raising Campaign under the umbrella of the ProCountry Agency and a well know popular person, Mr. Korneliusz Pacuda, was completed. An impact assessment by the Impact Assessment Committee of independent experts and NGO („Green Mazovia") found the campaign to have been very successful. Extensive activities aimed at disseminating information on the ozone shield protection and on the use of the "Green Cards", was carried out through: the production and distribution of various kind of leaflets, design of film scenarios, organization of concerts and seminars, interviews, publications, advertisements, TV programs, design of PrOzon' s web-page, distributing video-films to schools, CDs on the 3R scheme for enterprises and to NGOs for educational, knowledge management and environmental awareness raising purposes. This campaign was not originally part of the Project but was added in 1999 when it became clear that the sustainable operations of the 3R scheme needs support from the public. Also other countries' experiences proved the usefulness of environmental awareness raising to effectively achieve the objectives of the project.

4.2 Outputs by components:

The performance indicators for each component of the project were monitored during supervision.

The status of each indicator at closure is presented below.

Project Component Investment Component	Performance Indicator	Status at Closure
Technology Conversion refrigeration	Phase-out 275 ODP tons, at estimated appraisal. Another 150 ODP tons to be phased out indirectly- phaseout of CFC compressors production	The phase-out has been completed (200 ODP tons estimated retroactively) The phase-out has been completed
Technology Conversion - foam	Phase-out 319 tons of ODS	The phase-out has been completed (300 ODP tons estimated retroactively)
Technology Conversion - medical aerosols **3R/Training Component**	Phase out 320 tons of ODS	The phase-out (320 ODP tons) has been completed.
Establishing 3R Scheme/Training	a) train 1,600 refrigeration technicians in the use of non-ODS b) provide 950 portable ODS recovery units to the servicemen c) start operation of Reclaim Center d) training course on halon alternatives	a) 1,840 technicians trained b) 970 units have been provided to the servicemen c) Reclaim Center operates d) training course successfully completed e) PARC promoting 3R Scheme and ozone layer protection successfully completed (not included to original project design)
Institutional Strengthening Component	a) assist IDA to implement the project b) ensure Country Program is being implemented c) ensure monitoring ODS consumption is carried out	a) project was implemented successfully b) Country Program was implemented satisfactorily c) Monitoring of ODS consumption continued, regular reporting to Ozone Secretariat on that base is made

4.3 Net Present Value/Economic rate of return:

An economic analysis was not performed, since it would have been difficult to quantify the

environmental benefits of each sub-project. The project clearly has global environmental benefits since it contributed to preventing depletion of the earth's ozone layer. The thinning of the earth's ozone layer has been linked to the global warming, leading to a wide range of adverse environmental effects.

Cost-effectiveness criteria of the Montreal Protocol were applied to the technology conversion Sub-Project reduction process, with a view toward achieving the most appropriate targeting of GEF funds. The approved and actual cost-effectiveness for each Sub-Project is shown below. The actual cost of phase-out per unit ODP ton ($6.44/kg) was in line with the estimated cost ($6.80/kg). -- In comparison to other countries' actual cost-effectiveness figures (Bulgaria: $26.51/kg; Hungary $6.24/kg; Czech Republic: $0.98/kg; and Slovenia: $15.88/kg) the Polish project performance regarding cost-effectiveness was good, only the Czech project was much more cost-effective. -- The right column below indicates the MP thresholds for the relevant ODS phaseout sub-sector to be applied for the specific participating enterprise to show that each sub-project was implemented a very cost-effective manner, well below or just around the threshold figure.

Sub-project/ Enterprises	**Actual Annual ODP Phaseout Tons/yr**	**Approved Grant Cost Effectiveness US$/kg ODP**	**Actual Grant Cost Effectiveness US$/kg ODP**	**Montreal Protocol Thresholds US$/kg ODP**
1. Polar	200	2.65	2.65	13.76
2. Zamex	75	10.56 (threshold)	14.65	15.21
3. Inzynieria	19	7.83 (threshold)	7.84	7.83
4. Metalplast	300	1.60	1.60	7.83
5. Polfa	320	2.50	1.40	4.40
6. EDA/MPW /EKOPON	150 Indirect	11.33 Indirect	10.56 Indirect	Not applicable
7. PrOzon	140 Indirect	7.01 Indirect	8.01 Indirect	Not applicable
8. State Fire Service	--	Not applicable	Not applicable	Not applicable
IDA/OLPU	--	Not applicable	Not applicable	Not applicable
Totals:	**914 direct 1204 total**	**6.80 on direct phaseout 5.16 including indirect phaseout***	**6.44 on direct phaseout 4.9 including indirect phaseout**	**Not applicable**

* Cost effectiveness basis: Total Grant US$ / Total ODP kg

4.4 Financial rate of return:

Not applicable. A financial analysis for the project was not performed. However, an enterprise financial viability analysis was carried out during preparation to determine the prospects of each enterprise's remaining in business. The Bank, having a fiduciary responsibility towards the GEF, performed this analysis to ensure that the Grant was being allocated to enterprises that had prospects to survive in the transitional economy of Poland. The financial position of the enterprises were reported on a quarterly basis throughout the project implementation period by the local Bank acting as financial intermediary for the project. Except for EKOPON and Zamex, the enterprises that have received the GEF Grant are in business today and with the technology conversion are showing prospects of growth.

4.5 Institutional development impact:

The project had a significant institutional development impact. In the public sector, creation of the Ozone Layer Protection Unit (OLPU) and ODS Monitoring System was instrumental in building capacity to develop and implement the policies required to switch to non-ODS technology in the country. The change in technology has been complete and Poland is fully meeting the requirements of the Montreal Protocol. In addition, the technical assistance provided to PrOzon and COCH has helped to develop capacity to operate the 3 R scheme and train so far almost 2000 refrigeration technicians in the use of non-ODS substance and upon successful completion of the training receive the "Green card", which will become compulsory from July 1, 2002.

In the private sector, the project helped the enterprises meet the demand of ODS free products both in the domestic and the export markets. Through the project, officials in the beneficiary enterprises became fully acquainted with modern technology that does not use ODS. This has helped the enterprises to remain competitive. The Bank's procurement procedures also helped the enterprises appreciate the benefits of transparent and competitive bidding procedures.

Workshops Included in the Project:

Organizer:	Workshop:	No. of partici-pants from Poland	Cost	Date:	Venue:	Objectives of the Workshop
Organized by the PIU of Slovenia related to the Slovenian Sub-projects 9-14	Regional Workshop on Alternatives for Ozone Depleting Substances in the Solvent Sector	3	4,756 DEM	10/1997	Ribno, Slovenia	Exchange of information on legal systems dealing with ODS and on progress of phaseout in different sectors /specifically solvent sector/ in participating countries
Organized by the MOE and PMU of Czech Republic	Regional Workshops on Good Practices and Lessons of ODS Phaseout Projects	5 IDA, OLPU 3 COCH, PrOzon, SFSH	8,154 DEM 2,606 DEM	03/1998	Prague, Czech Republic	Exchange of information on lessons learned on implementing the GEF ODS Phaseout Projects in participating countries
Organized by the Hungarien Regional Office of the World Bank	International Workshop on ODS Phaseout – 3R Scheme	5 IDA, OLPU 5 COCH, PrOzon, Pro-Country	8,175 DEM 8,144 DEM	09/1999	Budapest, Hungary	Exchange of information on experiences of the participating countries on design and operation of 3r Schemes

Training Included in the Project:

Sub-project/ Enterprises:	Training for:	Number of Persons Trained:	Cost in US$ thousand	Venue:	Date:	Objective Of the Training:
Sub-project 7 PrOzon/ COCH	Engineers from COCH involved as teachers in training courses for servicemen in R&AC sector	4	19	Manchester, United Kingdom, Refrigerant Products	08/1999	Acquiring information on legal situation and practical operation of 3R Scheme in the U.K.
Sub-project 7 PrOzon/ COCH	Servicemen in R&AC sector	1,840	265	Krakow, Poland COCH	11/.1999 – 10/2000	Acquiring theoretical and practical knowledge needed for environment – friendly servicing the R&AC equipment containing ODS
Sub-project 8 State Fire Service Head-quarters	Designers of fire protection systems, students from fire protection schools, Representatives of certification institutions, The biggest halon users , representatives of companies dealing with selling and servicing of fire protection plants, authorities on fire protection matters	68	111	Józefów, Poland Research Center for Fire Protection	04/1998	Acquiring knowledge needed for environment – friendly halon management and on using alternative /non ODS technologies in fire protection sector

Consultant Services and Studies Included in the Project:

Sub-project/ Enterprises	Objective	Companies/ Individuals	Date	Impact of Studies	Costs
Sub-project 9 Institutional Strengthening of IDA	Legal support to IDA activity	Altheimer & Gray Poland Spólka z o.o.	10/1997 – 03/2000	Problems of legal nature faced in the Project solved	13,548.85 DEM
Sub-project 9 Institutional Strengthening of IDA	Technical support to IDA activity	Janusz Kozakiewicz Jadwiga Makosa	10/1997- 10/2000	-Problems of technical nature faced in the Project solved - Draft ICR and technical parts of quarterly reports submitted - PARC activities fully controlled and possible obstacles in 3R Scheme functioning identified	74,970 DEM
Sub-project 6 MCW-Poniatowa	Feasibility and efficiency study on establishment of a new company based on MPW	FINRYAN International	03/ 2000- 06/2000	New company established	43,000 PLZ (20,320.40 DEM)

5. Major Factors Affecting Implementation and Outcome

5.1 Factors outside the control of government or implementing agency:

While the Project objectives were fully met, there were delays in implementation. The Grant Agreement between Poland and the Bank became effective in June 1997, and the Project was initially expected to be closed on December 31, 1998. However, the Grant was extended three times, the first extension was provided until June 30, 2000, the second, until October 31, 2000 and the third, until April 30, 2001. The main reasons for the delay were the start-up phase difficulties with the recipient enterprises to enter in agreement as required under the Grant and the bankruptcy of EDA/MPW which involved social issues and job losses in a highly depressed region.

Macroeconomic Conditions

In the past decade Poland has been one of the most successful transition countries. The 1998 Russian crisis involving other former soviet countries had a significant impact on the manufacturing and trade sectors, yet the economy overall continued to grow. Two companies EDA/MPW and Zamex under the Project, however, lost their former CMEA markets primarily due to this crisis and its deflationary impact and finally went Bankrupt. -- In case of EDA/MPW, in an anyway depressed region where company turnaround and restructuring is more difficult, also the dragging on restructuring of the holding company at its subsidiaries delayed procurement and the implementation of the Sub-project. Probably, if the Sub-project had been completed well before the 1998 financial crises when also the competition in the compressor markets for ozone friendly appliances was not so strong, the company could have established a good market and continued sustainable operations. Also in case of Zamex, the stronger competition worldwide, in

Europe as well as in Poland contributed to the difficulties in sales. -- Enterprise restructuring and privatization has been accelerated by the Government. The Industrial Development Agency, the Government's specialized entity for restructuring and privatization saved the viable activities, including compressor production using GEF funded equipment, by establishing a new company EKOPON in mid 2000. Since 1991, Poland has been an Associate Member of the EU. A National Program is under implementation for the adoption of the EU legislation and directives, and screening their compliance. Negotiations commenced in 1998 and encompass 31 areas, of which harmonization with environmental directives is of high priority. Though significant progress has been made to improve the quality of the environment, significant investment is still needed especially in the areas of wastewater treatment and air pollution, as well as institutional development to strengthen environmental management.

Financial Intermediary

Citibank Warsaw was the financial intermediary throughout the whole Project. The Suppliers as well as the PMU, IDA experienced some delays in handling and clearing invoices.

Procurement

The PMU, IDA and some participating enterprises found the Bank's Procurement procedures at times too troublesome, in spite of the fact that most of the procurement was made under Polish Commercial Practices procedures. More Bank procurement training before implementation started would have been useful.

Project Management Reporting and Auditing

The quarterly PMRs and annual audit requirements of participating enterprises and the Project accounts were not always submitted in a timely manner and of good quality; some delays occurred. The Project audit of 1999, prepared by Deloitte and Touche, had to be redone and reissued to the Bank to meet formal requirements.

5.2 Factors generally subject to government control:

The Government properly supported the Project and accomplished its tasks through the development and introduction of suitable legislation and policy measures to meet the requirements of the Montreal Protocol (details in Section 4.1.).

5.3 Factors generally subject to implementing agency control:

Project Management

The Implementing Agency (IDA) assigned by the Recipient (MOE) was responsible for monitoring Sub-project implementation activities, procurement management and approval process for reporting and auditing, and for coordinating activities and information among all parties,

including Suppliers, participating entities and the Bank. At times IDA did not perform in a proactive, preventative or constructive manner. Occasionally IDA was rather passive than active and relied upon the Bank to resolve project implementation, suppliers' problems related to the bankruptcies, or other delays and to bring involved parties together to find the way of how to proceed (PrOzon and MPW). PMU staffing was at times inadequate; two professionals were absent for health reasons for considerable (several months) periods, and no replacement was provided by IDA for the PMU manager, who worked on this Project only part time. Requests for Grant extensions, and the reallocation of the proceeds of the Grant were properly handled by the PMU, as a result, all the Sub-projects were fully completed and Project objectives met.

The GEF Grant disbursements are shown below as an index of project progress during the implementation period.

Period	Percent of Grant Disbursed	Cumulative Percent Disbursed
July 1, '97 to June 30, '98	0,07	0,07
July 1, '98 to June 30, '99	31,42	31,49
July 1, '99 to June 30, '00	25,67	57,16
July 1, '00 to June 30, '01	42,84	100,00

5.4 Costs and financing:

At appraisal the estimated total project cost was US$ 20.167 million, with incremental costs of US$ 10.428 million. The financing plan was that the GEF Grant would provide US$ 6.214 million while the enterprises would contribute US$ 13.953 million. The GEF Grant was awarded to finance only items and activities included in the Indicative List of Eligible Incremental Costs adopted by the Meeting Parties to the Montreal Protocol. The GEF Grant was denominated in SDR (SDR 4.4 million corresponding to US$ 6.214 million) while the expenditures were mainly in US$ or DEM. Due to the fluctuating exchange rates, at project closing, the US$ dollar equivalent of the utilized GEF Grant was US$ 5.8 million. Details of the actual expenditures are presented below.

Consistent with the November 1994 GEF guidelines used to develop this project, expenditures incurred by enterprises after October 31, 1993 and before the date of Grant signing were eligible for retroactive financing. Retroactive financing was provided for two projects: Sub-Project No. 1. Polar for an amount of US $ 529,000; and Sub-Project No. 4. Metalplast for an amount of US $ 481,000.

No	Sub-Project Enter-Prise	APPRAISAL ESTIMATE COSTS & FINANCING							
		Financing in SDR and US$ thousand 1SDR=1.4123US$ at appraisal						SDR/US$ thousand	
		GEF			Enterprise			Project Cost	
		Local Cost	Foreign Cost	Total	Local Cost	Foreign Cost	Total	Total	Of which Increm.
1.	Polar		375 (a)	**375 (a)**			**2,466 (b)**	**2,841**	2,058
			529 (a)	**529 (a)**			**3,483 (b)**	**4,012**	2,907
2.	Zamex	30	531	**561**	218	-	**218**	**779**	561
		42	750	**792**	308		**308**	**1,100**	792
3.	Inzyneria	-	106	**106**	33	-	**33**	**138**	138
			149	**149**	46		**46**	**195**	195
4.	Metalplast	-	341 (a)	**341 (a)**	1,377	3,250	**4,627**	**4,968**	1,888
			481 (a)	**481 (a)**	1,945	4,590	**6,535**	**7,016**	2,666
5.	Polfa	106	460	**566**	142	168	**309**	**876**	708
		150	650	**800**	200	237	**437**	**1,237**	1,000
6.	EDA/MPW/	142	1,062	**1,208**	284	918	**1,202** (c)	**2,405**	1,208
	EKOPON	200	1,500	**1,700**	401	1,296	**1,697 (c)**	**3,397**	1,700
7.	PrOzon	319	377	**695**	301	717	**1,018 (d)**	**1,714**	695
		450	532	**982**	425	1,013	**1,438 (d)**	**2,420**	982
8.	State Fire	71	8	**76**	6	-	**6**	**85**	76
	Service	100	11	**111**	9		**9**	**120**	111
9.	IDA/OLPU	14	39	**53**	-	-	-	**53**	53
		20	55	**75**				**75**	75
	Sub-totals	**681**	**3,297**	**3,979**	**3,126**	**6,754**	**9,880**	**13,858**	**7,384**
		962	**4,657**	**5,619**	**4,415**	**9,538**	**13,953**	**19,572**	**10,428**
	Contingency (12% of the non retroactive GEF Grant)		319	**368**				**368**	
			450	**520**				**520**	
		50							
		70							
	Financial Agency Fee (1.25%)	53	-	**53**				**53**	
		75		**75**				**75**	
	Total			**4,400**	**3,126**	**6,754**	**9,880**	**14,280**	**7,384**
				6,214	**4,415**	**9,538**	**13,953**	**20,167**	**10,428**

(a) retroactive financing.
(b) of which, US$ 1 million Polish Ekofund Grant.
(c) of which, US$ 70,000 loan from the Polish National Fund for Environmental and Water Management.
(d) of which, possible US$ 550,000 Polish Ekofund Grant.

No	Sub-Project Enter-Prise	ACTUAL COSTS & FINANCING							
		Financing in US$ thousand						US$ thousand	
		GEF			Enterprise			Project Cost	
		Local Cost	Foreign Cost	Total	Local Cost	Foreign Cost	Total	Total	Of which Increm.
1.	Polar	0	529	**529**	3,484.5		**3,484.5**	**4,013.5**	To
2.	Zamex	38.9	1059.6	**1098,6**	384.9		**384.9**	**1,483.5**	Be
3.	Inzyneria	0	149	**149**	78.6		**78.6**	**227.6**	Provid-
4.	Metalplast	0	481	**481**	7,339.3		**7,339.3**	**7,820.3**	ed
5.	Polfa	82.9	403.7	**486.6**	1,046.7	480.3	**1,527**	**2,013.6**	
6.	EDA/MPW/ EKOPON	56.5	1,528.2	**1,584.7**	21.8		**21.8**	**1,606.5**	
7.	PrOzon	469.6	653	**1,122.6**	339.4	227.2	**616.6**	**1,739.2**	
8.	State Fire Service	43	63.5	**106.5**	3.3	0	**3.3**	**109.8**	
9.	IDA/OLPU	116	0	**116**	0	0	**0**	**116**	
	Sub-totals	**807**	**4,867**	**5,674**	**12,698.5**	**707.5**	**13,456**	**19,129.9**	
	Contingency (12% of the non retroactive GEF Grant)								
	Financial Agency Fee (1.25%)	208	0	**208**				**208**	
	Total	**1,015**	**4,867**	**5,882**	**12,698.5**	**707.5**	**13,456**	**19,338**	

(a) retroactive financing US$1,010,000
(b) of which, US$ 259 800 Polish Ekofund Grant.

6. Sustainability

6.1 Rationale for sustainability rating:

The Project is sustainable for the following reasons:

- the policies required for Poland to meet the Montreal Protocol requirements are in place and these policy measures are being introduced and enforced by the Government.
- the domestic and export markets of the participating enterprises require the use of non-ODS substances. As a result, all the enterprises participating in the Project, -- except for Zamex and EKOPON, which are today not in operation, -- make the best use of the technology

conversion implemented under the Grant and strive to remain competitive and expand their businesses as possible.

- from a global environmental sustainability perspective, the alternative substances introduced as substitutes of CFCs are approved by the Montreal Protocol. From safety aspect, any fire or explosive hazard due to the use of cyclopentane as foaming agent is minimized by the safety audits and the rigorous, even more than the EU, Polish safety regulations. All new installations that have been made so far, have received the environmental, fire protection and labor safety permits as required by Polish law.
- the public awareness raising campaign carried out under the Project and the Country Program made relevant strata of the society aware of the benefits of the use of ozone friendly technologies, the vital importance of the Ozone Shield and how everybody can/must contribute to its protection. Specifically, public pressure and demand will ensure that enterprises do not use and vent deliberately ODS. The campaign also helped the understanding of the public of other global environmental issues, especially the climate change.
- The 3 R scheme initially seems to operate well in spite of not having had all the enabling legislation in place. It allows for the recovery, reclamation and recycling not only of CFCs, but also HCFCs and HFCs. This is beneficial to the environment and in the EU accession process.
- the training and certification program provided to almost 2,000 refrigeration technicians to date has allowed the service sector to handle existing ODS in hermetically closed system and repair old appliances for longer duration, and to move towards non-ODS equipment use.

6.2 Transition arrangement to regular operations:

The Country Program and Project objectives have fully been met and the technology conversion has been completed as required by the Montreal Protocol and its amendments. However, since Poland is a EU pre-accession country, remaining ODSs (HCFCs and Methyl Bromide) according to the schedules agreed with the EU will need to be phased out. A demonstration project on Methyl Bromide alternatives financed in the framework of a UNEP/GEF Project for Central and Eastern European countries is presently carried out in Poland. No follow-up project or support of the Bank is required.

7. Bank and Borrower Performance

Bank

7.1 Lending:

The Bank was the Implementing Agency on behalf the GEF to administer the Grant Project and was requested by the Government of Poland to assist in the preparation of the Project. The Bank's experience in managing projects worldwide as well as its accumulated knowledge of good practices was useful during preparation and implementation. While the Project was prepared in 13 months time, the Board approved it 11 months after appraisal. The implementation period was underestimated at appraisal, but the fact has to be mentioned that the second and third closing date extension was required because of the originally not foreseen bankruptcy of EDA/MPW. At appraisal a financial viability analysis of all the enterprises with the potential to participate in the

Project was carried out. All the selected ones were found to be financially viable and sustainable. Based on the Bank's practice in the Czech Republic, Hungary and Slovenia, the Grant Agreement did not include any stipulation for the possible case of bankruptcy, also since the macroeconomic conditions were very good at lending. This practice was followed also in case of the Polish project. Later, other ODS Phaseout Projects in the region did actually anticipate the bankruptcy problem and the below grant agreement clause was included:

"... a commitment by the Beneficiary, impending insolvency or discontinuation of activities, to make arrangements with the Implementing Agency to ensure that equipment and materials included in the sub-project and financed wholly or partly from the proceeds of the GEF Trust Fund Grant shall continue to be utilized for purposes consistent with the objectives of the Project."

This clause proved to be useful e.g. in case of the restructuring of one ODS phaseout project in the region. Including this clause in the Grant Agreement for the Polish project might have urged the Recipient to try to protect the interest of the GEF funds use, i.e. that equipment funded by the GEF should be in operation in a sustainable manner during a reasonable lifetime of the equipment, through trying to be more active in monitoring each sub-project also from financial viability aspects and consider possible support to the enterprises, which were lacking modern management techniques and staff. However as it looks today, both the EKOPON and Zamex equipment supplied under the Grant will be in operation.

On the other hand, including such legal language in the GEF grant agreements might put responsibilities on governments for which they can't be responsible. The GEF accepted private enterprises, legally separate from the government, as the ultimate grant recipients after a careful financial viability analysis and selection process at appraisal, thus taking a chance that some of these enterprises won't be around at the end of the project. And just because GEF funds were used, GEF should not give the Ministry of Economy any special right to control the equipment financed under the grant when private enterprises were chosen to receive it. Rather enterprise bankruptcy should be governed by bankruptcy rules, and the government should have to deal within that framework. The point should be that GEF needs to take responsibility for choosing the enterprises, and run the risk that equipment financed may go to a company that files for bankruptcy, and in which case bankruptcy rules should be followed without any special privileges.

7.2 Supervision:

The Bank's support was necessary throughout the whole implementation period especially in the following cases:

In April 99 when several problems culminated regarding the PrOzon Sub-project: PrOzon's Manager resigned, its founders became keen to get rid of any liabilities regarding the operation of the reclamation plant, since they didn't see how it could be operated without financial losses and lack of proper legal regulatory framework and enforcement of legislation. The Bank promoted proper communication, drafted a solution that was attractive to all stakeholders and urged the Government for proper legislation making.

Mid 2000 the Bank helped again to convince the Government of Poland to speed up the introduction of the necessary legislation for more stringent control including the banning of venting of refrigerants exempt the recovered ODS from being treated as hazardous waste if they are stored or transported for the purpose of further reclaim (cleaning).

The Bank has provided intensive support to the PMU since early 1999, when the MPW went bankrupt. The issue was how to hive off the compressor production activity of the bankrupt company that formed the GEF Sub-project in such a way that the implementation of the Sub-project can continue and be completed with full success with the provisions of long term sustainable operation and use of the equipment procured under the Grant. The Bank supported the preparation of a comprehensive business plan, based on the findings and recommendations of which, the Ministry of Economy could initiate with IDA the establishment of a new company. In the transition period IDA informally and temporarily suspended payments to Suppliers, therefore the Bank had to respond to and coordinate with complaining suppliers.

The Bank initiated and supported international workshops in Hungary, Slovenia and the Czech Republic, which proved to be useful also for the Polish parties. Elements from legislation related to the 3R scheme like the introduction of the "green card" for servicemen was adopted from the Hungarian experience. Also learning from other countries' lessons, bad practices could be avoided, which were useful regarding the operations of the 3R scheme and the public awareness raising campaign.

7.3 Overall Bank performance:

The Bank's performance was satisfactory. The project team was particularly helpful in assisting the participating enterprises in designing technical solutions for phasing out ODS and in working with Government to resolve issues associated with the bankruptcies of two participating firms.

Borrower
7.4 Preparation:

The OLPU, the activities of which were financed by the Ministry of Economy and Ministry of Environment, played a key and constructive role in the preparation of the Project and also in developing the new legislation dealing with ODS.

7.5 Government implementation performance:

The Borrower's performance was overall satisfactory. Despite some delays, the Borrower was committed to the Project objective and to phasing out ozone depleting substances. Government took seriously its obligations under the Montreal Protocol, passed appropriate legislation, and adequately managed the project.
When the problems regarding the bankruptcies had surfaced, the MOE tried to help find a solution for MPW and approved that IDA would establish a new company, EKOPON. Also MOE informed Zamex's Receiver to handle the equipment funded by the Grant with special care.

7.6 Implementing Agency:

The overall Implementing Agency performance would be rated as marginally satisfactory, if there were such rating in the ICR form, for reasons mentioned in sections 5.3 and 7.6. Overall the PMU, IDA met its obligations under the Project Administration Agreement, but often with delay and in a reactive manner trying to do "fire-fighting" rather than professional project management. Participating enterprises, stakeholders of issues, suppliers and sometimes the Bank were not properly informed in a timely manner. At times the PMU, IDA performance was close to being unsatisfactory. IDA established a new company, EKOPON to save the MPW Sub-project. Also IDA supervised the new management of EKOPON and injected own funds both as debt and equity in EKOPON, thus enabling the new company to start operations. IDA's technical and legal consultants made a considerable input to assist in the implementation of the Project. The overall rating of the Implementing Agency as satisfactory (in Annex 6) took some consideration, but since ultimately all actions needed were done, even if with delays, proved by the successful achievement of the Project objectives, the consideration of the rating as unsatisfactory for the Implementing Agency performance, was dropped.

7.7 Overall Borrower performance:

The overall grant recipient performance was rated as satisfactory, since the Project met its development objectives well, all ODS were phased out. The staff and the consultants of IDA and OLPU were professionals, however IDA commitment to the success of the Project was not at all times high enough. The performance of the participating enterprises was generally good. Excellent management of the Polfa sub-project should be highlighted here.

8. Lessons Learned

The lessons learnt are elaborated below in Italics:

More careful selection of enterprises at appraisal from financial viability and sustainability aspects

Difficult to anticipate the bankruptcy problem also at company level.

Even if the country's macroeconomics and financial situation is stable, thus country risks are low, companies participating in the project can go bankrupt for unforeseeable reasons at appraisal, when the financial viability of the participating enterprises is considered.

Environmental Public Awareness Raising Campaign should be part of such projects

Environmental projects, especially the ones that serve global environmental protection with lesser local than global benefits and introduce new technologies, servicing activities and market products, can only be successful with the support of the public, to which proper understanding of the issues and how protection can be made is inevitable.

A public awareness raising campaign (PARC) was not originally part of the Project. Based on the good practices of other countries' similar projects, the Bank supported the PrOzon initiative. The

carried out campaign proved to be inevitable for the operation of the 3 R scheme.

Utilize well-known relevant personalities and NGOs for Public Awareness Raising

Involve well-known, popular people and NGOs in the campaign, since they cost- and time-effectively disseminate information.

The public always likes to listen to their favorites, and NGOs can easily, effectively and in a convincing manner can reach the public, especially youth and local communities.

Environmental labeling and financial incentives are useful in the market

Companies' management require good, up-to-date marketing and financing skills in a more and more competitive environment.

The small private company Inzynieria (Warsaw) that converted its technology from CFC-11 blowing agent in the production of rigid polyurethane pipe insulation introduced "environmental labeling" of their products. Inzynieria applied for an environmental credit line at the Polish Bank for Environmental Protection (BOS). BOS provided the credit line to the buyers of Inzynieria – small credits with lower than market interest rate, only 10 percent for the double positive environmental impact of the Inzynieria products, for the ozone friendly and lower energy use, reduction of GHG emissions. This credit is given to the companies, which have taken the decision to cooperate with Inzynieria in the frame of changing the insulation of the pipes. The credit covers the costs of the following: delivery of the new insulation, removal of the old insulation including its possible recycling, the anti-corrosive protection of the pipes, and the installation of the new insulation. The reduction of energy use for the pipes equipped with new insulation produced by Inzynieria are 50% lower than the standard Polish. As a result their sales went up, current demand for their products is higher than their production capacity.

Technical Assistance in Sub Project Design

Companies require real technical assistance when preparing sub-projects to other reliable cost estimates.

From 1998 onwards, the Project provided regular technical supervision by a refrigeration expert. Prior to that little specialist expert assistance was provided to either refrigeration sub-sector enterprises, or those in other sub-sectors, such as foam. Three companies were surprised by the extent of re-equipment required to implement their respective non-ODS technologies. Zamex had underestimated the number of new molds required to convert its freezers to cyclopentane blown foam and Inzynieria had not realized that much larger molds for pipe sections would be required for implementing CO2 foam. Metalplast had not realized that mechanical cooling would be required for the n-pentane storage area, that a special panel saw would be required, or that the metal adhesion properties of the new foam would require a special technique to maintain product quality. Since project funding levels had effectively been capped by the MP cost effectiveness threshold levels, better awareness of the cost implications of the new technology would have

helped these enterprises plan their counterpart funding more efficiently. Zamex' recent bankruptcy cannot be blamed on the ODS Project, its need to find extra finance during a difficult period could not have been helped. Both Metalplast and Inzynieria survived and report improving business. POLFA could have received more funding including the new packaging equipment. Also they had not anticipated the need for a facility to destroy rejected aerosol cans.

Effective Project Monitoring and Management.

It is important to choose the right PMU and enable it to concentrate fully on Project supervision.

The Bank was informed too late of financial problems experienced by two sub projects during implementation. They were informed in January 2001 that in October 2000 Zamex had filed for bankruptcy in the local court. At the end of January 2000 news of EKOPON's imminent bankruptcy was suddenly communicated to the Bank, whereas the Project Progress Report for end December 1999 gave a clear picture of "business as usual". This was too late for contracts to be canceled without heavy damages being claimed by suppliers and has involved lengthy and expensive efforts by both the Bank and the PMU to avoid an embarrassing situation from developing.

Drawing a clear lesson from these failings is not straightforward. The fact is that the PMU was only able to devote about half its time to ODS Project supervision. The Polish PMU is unusual in that it is located within the IDA and run by its staff, something that ought to make them particularly skillful in monitoring the financial performance of companies under their care. Perhaps a more rigorous financial evaluation should have been carried out before GEF approval was sought, however, the shock of the Russia crisis and subsequent devaluation were hard to anticipate. At the same time the IDA staff will continue their jobs after the project is closed, thus preserving the project files and institutional capacity to implement other such projects in future (such as under POP's) should there be a role for Government to sponsor them.

The Success of the PrOzon 3R Sub project

Refrigerant Recovery and Reclaim will be practical and profitable, even when CFCs run out. Legal certification for mechanics is not a pre-requisite for a successful scheme.

The present success of PrOzon was not anticipated in 1998 when the two main private refrigerant distributors, the founders of the non-profit entity, expressed misgivings to the Bank mission about whether the 3 R scheme could ever work. The Grant funded also the supply of the recovery machines for the refrigeration servicemen so that they can safely, without the risk of venting, can recover CFCs from the existing industrial and household appliances and submit the gases for reclamation. The initial design of this sub project was based on the assumption that sales of recovery machines to servicemen would cover the running costs of the organization managing the project. This concept proved unworkable. When this became obvious in 1998, the Bank agreed that some additional funds could be used under the Grant by PrOzon to cover initial incremental operating costs until the refrigerant recovery and reclaim got under way. This enabled recovery machines to be distributed free of charge to technicians, provided they had participated in the

environmental training courses (in CFC-12 conservation and HCF-134a services procedures) organized by the Refrigeration Center of Krakow and meet the following conditions. Upon successful pass of the exam at end of the course, the servicemen can get the recovery unit -- free of charge in case they can deliver 50 kg of CFC within three months to the reclaim plant or the cylinder depots, if not so they pay a lease fee of about USD 30 semi-annually. Also, servicemen, who successfully pass the course, receive the "Green card", which will become compulsory from July 1, 2002. In the event more recovery machines than originally anticipated were purchased and distributed, and more technicians received training. These actions dramatically increased the participation rate of technicians in the 3 R scheme. So far 1,840 servicemen have been trained and COCH training courses are today over-subscribed. By March 2001 a total of nearly 31 tons of refrigerant had been recovered. This comprises 14.5 tons of CFC-12 and 11, 5.5 tons of HCFC-22, over 7 tons of HFC-134a and small but significant quantities of blends R-404a, R-409a and R-406a in little over a year, fully vindicating the original support of this Sub-project. As yet, there is no legal requirement for refrigeration technicians to have received refrigerant recovery training, but such legislation under the ODS Management Act will be passed shortly. Technician compliance has been achieved solely through the PARC, and awareness initiatives targeted specifically at technicians. The idea that the public should demand that any technician should possess a "Green Card" was successfully promoted through the PARC.

The lessons that can be drawn are (i) that it is both practical and profitable to recover and reclaim HCFC and HFC refrigerants and bends, and that as CFCs are phased this contributes crucially to the sustainability of 3 R schemes (ii) that training and awareness initiatives play a key role in the success of a 3 R scheme, both in providing technical knowledge and sensitizing technicians to environmental issues (iii) that recovery must be made financially attractive to technicians to enable it to be successful (iv) that specific legal requirements for technicians to be trained in recovery and reclaim techniques is not pre-requisite, but supports to have a successful scheme.

The Polish scheme joins the Hungarian, Belarus and Slovenian schemes as examples for other countries preparing similar sub-projects. It differs from these in that it works through the distribution network of companies selling refrigerant rather than refrigeration service companies and offers a new model for designing a successful scheme.

9. Partner Comments

(a) Borrower/implementing agency:
The draft ICR was sent to the Ministry of Economy (Government of Poland as Grant Recipient's responsible entity for this Project) and the IDA (Financial Agent and Implementing Agency) on May 17, 2001 for comments, until the date of this draft (June 13, 2001) no response / comments have been received.

(b) Cofinanciers:
Not applicable. There were no cofinanciers of the Project.

(c) Other partners (NGOs/private sector):
Not applicable. There were no other partners of this Project.

10. Additional Information

Not applicable.

Annex 1. Key Performance Indicators/Log Frame Matrix

A log frame analysis was not part of the Bank's appraisal documentation when the Project was prepared, a log frame analysis was not performed for this particular Project. However, performance indicators for each component of the Project were identified during supervision. The status of each indicator at closure is presented in table in Section 4.2.

Project Component	Performance Indicator	Status at Closure
Investment Component		
Technology Conversion – refrigeration	Phase-out 275 ODP tons, at appraisal.	The phase-out has been completed (200 ODP tons retroactively)
	Another 150 ODP tons to be phased out indirectly-phaseoutof of CFC compressors production	The phase-out has been completed
Technology Conversion - foam	Phase-out 319 tons of ODS	The phase-out has been completed (300 ODP tons retroactively)
Technology Conversion - medical aerosols	Phase out 320 tons of ODS	The phase-out (320 ODP tons) has been completed.
3R/Training Component		
Establishing 3R Scheme/Training	a) train 1,600 refrigeration technicians in the use of non-ODS	a) 1,840 technicians trained
	b) provide 950 portable ODS recovery units to the servicemen	b) 970 units have been provided to the servicemen
	c)start operation of Reclaim Centre	c) Reclaim Centre operates
	d) training course on halon alternatives	d) training course successfully completed
		e) PARCpromoting 3R Scheme and ozone layer protection successfully completed (not included to original project design)
Institutional Strengthening Component	a) assist IDA to implement the project	a) project was implemented successfully
	b) ensure Country Program is being implemented	b) Country Program was implemented satisfactorily
	c)ensure monitoring ODS consumption is carried out	c) Monitoring of ODS consumption continued, regular reporting to Ozone Secretariat on that base is made

Output Indicators:

Indicator/Matrix	Projected in last PSR[1]	Actual/Latest Estimate
Polar: Elimination of annual consumption of CFC-12 and of CFC-11		Completed ODS Phaseout (200 ODP tons)
ZAMEX: Elimination of annual consumption of CFC-11.(CFC-12 refrigerant phaseout, previously implemented, is outside the scope of the Sub-Project.)		Completed ODS Phaseout (75 ODP tons)
Inzynieria: Elimination of annual consumption of CFC-11		Completed ODS Phaseout (19 ODP tons)
Metalplast: elimination of annual consumption of CFC-11		Complete ODS Phaseout (300 ODP tons)
POLFA: Elimination of annual consumption of CFC-11 and CFC-12		Complete ODS Phaseout (320 ODP tons)
EDA/MPW/EKOPON		Completed indirect Phaseout of 150 ODP tons
PrOzon		Completed indirect Phaseout of 140 ODP tons

[1] End of project

Annex 2. Project Costs and Financing

Project Cost by Component (in US$ million equivalent)

Project Cost By Component	Appraisal Estimate US$ million	Actual/Latest Estimate US$ million	Percentage of Appraisal
Technology Conversion and Investment Component:			
Refrigeration (Sub-projects 1. and 2.):	5.11	5.50	107.53
Foaming (Sub-projects 3. and 4.):	7.21	8.05	111.6
Pharmaceutical propellant (Sub-project 5.):	1.24	2.01	162.81
Refrigerator compressors (Sub-project 6.):	3.40	1.61	47.28
Recovery, Reclamation and Recycyling of Refrigerants (3 R) Component (Sub-project 7.)	2.42	1.74	71.86
Institutional Strengthening Component:			
Fire protection (Sub-project 8.):	0.12	0.11	91.66
Institutional Strengthening IDA/OLPU (Sub-project 9.):	0.08	0.12	154.66
Local Financial Agency Fee	0.08	0.21	277.33
Total Baseline Cost	19.66	19.35	
Physical Contingencies	0.52	0.00	0
Total Project Costs	20.18	19.35	
Total Financing Required	20.18	19.35	

Project Costs by Procurement Arrangements (Appraisal Estimate) (US$ million equivalent)

Expenditure Category	Procurement Method[1] ICB	NCB	Other[2]	N.B.F.	Total Cost
1. Works	0.00	0.00	0.00	0.00	0.00
	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)
2. Goods	0.00	0.00	0.00	0.00	0.00
	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)
3. Services	0.00	0.00	0.00	0.00	0.00
	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)
4. Miscellaneous	0.00	0.00	0.00	0.00	0.00
	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)
5. Miscellaneous	0.00	0.00	0.00	0.00	0.00
	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)
6. Miscellaneous	0.00	0.00	0.00	0.00	0.00
	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)
Total	0.00	0.00	0.00	0.00	0.00
	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)

The above table categories are not relevant for this particular Project.

Project Costs by Procurement Arrangements (Appraisal Estimate)
(US$ thousand equivalent)

Expenditure Category	Procurement Method ICB	LIB	Other (IS, NS, DC)	Non Bank Finance	Total Cost
1. Goods					
1.1. Equipment	500		5,030	13,426	**18,956**
(including installation)	(500) (a)		(5,030) (b)		**(5,530)**
1.2. Materials			150	68	**218**
			(150) (b)		**(150)**
2. Consultants' services and training					
2.1. Expert Consultants			22		**22**
			(22) (c)		**(22)**
2.2 State Fire Service			125	9	**134**
Seminars			(125) (c)		**(125)**
2.3. Training			280		**280**
			(280) (c)		**(280)**
2.4. Other (Studies)				450	**450**
3. Miscellaneous					
3.1. Incremental			22 (d)		**22**
Operating Costs of			(22)		**(22)**
IDA/OLPU Institutional Strengthening					
3.2. Local Financial			85 (e)		**85**
Agent Fee			(85)		**(85)**
Total (f)	**500**		**5,514**	**13,953**	**20,167**
	(500)		**(5,514)**		**(6,214)**

(...)	Figures in parenthesis are the amounts to be financed by the Bank Grant. All costs include contingencies.

IS: International Shopping; NS: National Shopping; DC: Direct Contracting

(a) ICB will be used for large batches of recovery machines for the 3R PrOzon Sub-Project (over US$ 250,000).

(b) To be procured in accordance with procurement limits agreed upon in Schedule B. They consist of: (i) Prudent Commercial Practices: up to US$ 4.6 million; (ii) International Shopping: up to US$ 0.6 million; and (iii) National Shopping: up to US$ 0.1 million.

(c) Consultants' services (engineering support, on site installation assistance, training in the operation and safety of new equipment, study abroad tours, etc.) to be procured in accordance with World Bank Guidelines: "Use of Consultants by World Bank Borrowers and by World Bank as Executing Agency" "; Washington, D.C., August 1996, September 1997 and January 1999.

(d) Funds will cover the costs of consultant- and IDA-staff travel and subsistence.

Project Costs by Procurement Arrangements (Actual/Latest Estimate) US$ thousand:

Expenditure Category US$ thousand	Procurement Method ICB	LIB	Other (IS, NS, CP,DC)	Non Bank Finance	Total Cost
1. Goods	-	**403,7**	**4493**	**12 883,6**	**17 780,3**
1.1. Equipment (including installation)	-	403,7	4493	11 598	16 494,7
1.2. Materials	-	-	-	*	-
1.3. Works				1285,6	1285,6
2. Consultants' services and training	-	-	**632,7**	**276,8**	**909,6**
2.1. Expert Consultants	-	-	166	237,2	403,2
2.2 State Fire Service Seminars	-	-	105,7	3,3	109
2.3. Training	-	-	283,8	14,3	298,1
2.4. Other (Studies)	-	-	77,2	22	99,2
3. Miscellaneous	-	-	**312,6**	**295,6**	**608,2**
3.1. Institutional Strengthening of IDA/OLPU	-	-	104,6	-	104,6
3.2. Fee of PIU and FI	-	-	208	-	208
3.3. Other				295,6	295,6
Total (f)	-	**403,7**	**5438,3**	**13 456**	**19 298**

* data not available yet.

Project Costs by Procurement Arrangements (Actual/Latest Estimate) (US$ million equivalent)

Expenditure Category	Procurement Method[1] ICB	NCB	Other[2]	N.B.F.	Total Cost
1. Works	0.00 (0.00)	0.00 (0.00)	0.00 (0.00)	0.00 (0.00)	0.00 (0.00)
2. Goods	0.00 (0.00)	0.00 (0.00)	0.00 (0.00)	0.00 (0.00)	0.00 (0.00)
3. Services	0.00 (0.00)	0.00 (0.00)	0.00 (0.00)	0.00 (0.00)	0.00 (0.00)
4. Miscellaneous	0.00 (0.00)	0.00 (0.00)	0.00 (0.00)	0.00 (0.00)	0.00 (0.00)
5. Miscellaneous	0.00 (0.00)	0.00 (0.00)	0.00 (0.00)	0.00 (0.00)	0.00 (0.00)
6. Miscellaneous	0.00 (0.00)	0.00 (0.00)	0.00 (0.00)	0.00 (0.00)	0.00 (0.00)
Total	0.00 (0.00)	0.00 (0.00)	0.00 (0.00)	0.00 (0.00)	0.00 (0.00)

Please see this table above.

[1/] Figures in parenthesis are the amounts to be financed by the Bank Loan. All costs include contingencies.

[2/] Includes civil works and goods to be procured through national shopping, consulting services, services of contracted staff of the project management office, training, technical assistance services, and incremental operating costs related to (i) managing the project, and (ii) re-lending project funds to local government units.

Project Financing by Component (in US$ million equivalent)

Component	Appraisal Estimate			Actual/Latest Estimate			Percentage of Appraisal		
	Bank	Govt.	CoF.	Bank	Govt.	CoF.	Bank	Govt.	CoF.
Technology Conversion and Investment Component:	4.45	12.51		4.33	12.84		97.3	102.6	
Recoverty, Recliam and Recycling of Refrigerants Component:	0.98	1.44		1.12	0.62		114.3	43.1	
Institutional Strengthening Component:	0.20	0.00		0.22	0.00		110.0	0.0	
Components Total:	5.62	13.95		5.67	13.46		100.9	96.5	
Contingency:	0.52						0.0		
Financial Agency Fee:	0.08			0.21			262.5		
Project Total:	6.21	13.95		5.88	13.46		94.7	96.5	

Bank = GEF
Govt.= Enterprise

Annex 3. Economic Costs and Benefits

An economic analysis was not performed for this Project since the local, regional and global environmental (vital) benefits of the Project would be difficult to quantify. The ozone layer protection is invaluable, since without the Ozone Shield, there can be no life on earth.

Annex 4. Bank Inputs

(a) Missions:

Stage of Project Cycle	No. of Persons and Specialty (e.g. 2 Economists, 1 FMS, etc.)		Performance Rating	
Month/Year	Count	Specialty	Implementation Progress	Development Objective
Identification/Preparation				
March 1995 to	*1*	Task Team Leader		
April 1996	*1*	Environmental Specialist		
	1	Financial Analyst		
	2	Technical Specialist		
Appraisal/Negotiation				
May 1996 to	*1*	Task Team Leader		
July 1996	*1*	Environmental Specialist		
	1	Financial Analyst		
	1	Technical Specialist		
Supervision				
March 1998	*2*	Task Team Leader, Economist	S	S
October 1998	*2*	Task Team Leader, Technical Specialist	S	S
April 1999	*3*	Task Team Leader, Technical Specialist, Procurement Specialist	S	HS
October 1999	*2*	Task Team Leader, Technical Specialist	S	HS
March 2000	*2*	Task Team Leader, Technical Specialist	S	S
June 2000	*2*	Task Team Leader, Technical Specialist	S	S
November 2000	*2*	Task Team Leader, Technical Specialist	S	S
February 2001	*2*	Task Team Leader, Financial Management Specialist	S	S
ICR				
May 2001	*1*	Task Team Leader	S	S

(b) Staff:

Stage of Project Cycle	Actual/Latest Estimate	
	No. Staff weeks	US$ ('000)
Identification/Preparation	?	~100,000
Appraisal/Negotiation	?	~160,000
Supervision	?	145,000
ICR	8	17,500
Total	?	422,500

Annex 5. Ratings for Achievement of Objectives/Outputs of Components

(H=High, SU=Substantial, M=Modest, N=Negligible, NA=Not Applicable)

	Rating
☐ *Macro policies*	○ *H* ○ *SU* ○ *M* ○ *N* ● *NA*
☐ *Sector Policies*	○ *H* ● *SU* ○ *M* ○ *N* ○ *NA*
☐ *Physical*	○ *H* ○ *SU* ● *M* ○ *N* ○ *NA*
☐ *Financial*	○ *H* ○ *SU* ● *M* ○ *N* ○ *NA*
☐ *Institutional Development*	○ *H* ● *SU* ○ *M* ○ *N* ○ *NA*
☐ *Environmental*	● *H* ○ *SU* ○ *M* ○ *N* ○ *NA*
Social	
☐ *Poverty Reduction*	○ *H* ○ *SU* ○ *M* ○ *N* ● *NA*
☐ *Gender*	○ *H* ○ *SU* ○ *M* ○ *N* ● *NA*
☒ *Other (Please specify)* *Job saving*	○ *H* ○ *SU* ● *M* ○ *N* ○ *NA*
☐ *Private sector development*	○ *H* ○ *SU* ● *M* ○ *N* ○ *NA*
☐ *Public sector management*	○ *H* ○ *SU* ● *M* ○ *N* ○ *NA*
☒ *Other (Please specify)* *environmental awareness raising*	○ *H* ● *SU* ○ *M* ○ *N* ○ *NA*

Annex 6. Ratings of Bank and Borrower Performance

(HS=Highly Satisfactory, S=Satisfactory, U=Unsatisfactory, HU=Highly Unsatisfactory)

6.1 Bank performance	*Rating*
☐ *Lending*	○ *HS* ● *S* ○ *U* ○ *HU*
☐ *Supervision*	○ *HS* ● *S* ○ *U* ○ *HU*
☐ *Overall*	○ *HS* ● *S* ○ *U* ○ *HU*

6.2 Borrower performance	*Rating*
☐ *Preparation*	○ *HS* ● *S* ○ *U* ○ *HU*
☐ *Government implementation performance*	○ *HS* ● *S* ○ *U* ○ *HU*
☐ *Implementation agency performance*	○ *HS* ● *S* ○ *U* ○ *HU*
☐ *Overall*	○ *HS* ● *S* ○ *U* ○ *HU*

Annex 7. List of Supporting Documents

1. Country Program for Phase-out of ODS in Poland
2. Poland: Ozone Depleting Substances Phase-out Project Bank's appraisal document, February 1997
3. Sub-project completion reports