

Final Evaluation of the UNDP–GEF Project "Turkmenistan – Improving the Energy Efficiency of the Heat and Hot Water Supply"

Prepared by: Grant Ballard–Tremeer

Last edited: 11 March 2022

Status: Draft

ecoharmony.com



✉ PO Box 900, London, Bromley, BR1 9FF, United Kingdom

☎ +44-20 7193 3699

📠 +44-870 137 2360 and +44-70 9236 7695

📧 info@ecoharmony.com

This evaluation of the UNDP-GEF project “Turkmenistan - Improving the Energy Efficiency of the Heat and Hot Water Supply” (TUK/01/G35/A/1G/99) was carried out between 16 July 2007 and 31 August 2007.

The evaluation has been carried out for the Turkmenistan Office of the United National Development Programme (under contract SSA 2007-091-1) by Dr Grant Ballard-Tremeer (grant@ecoharmony.com), Eco Ltd of local UNDP and project staff.

Contents

Contents	1
Executive Summary	3
Introduction	7
I. The project and its development context	8
Background	8
Project outcomes and objectives	9
Key stakeholders and beneficiaries for this outcome	10
II. Findings and Conclusions.....	12
A. Project formulation (relevance & design)	12
Relevance to local and national development priorities.....	12
Relevance to target groups.....	14
Project design	15
B. Implementation	19
Implementation approach	19
Management arrangements.....	21
Stakeholder participation	23
Monitoring and evaluation	24
Financial Planning	24
C. Results	25
Impact.....	25
Assessment of project deliverables.....	25
Sustainability and replicability	32
III. Recommendations.....	34
IV. Lessons Learned	35
Annex 1: Evaluation terms of reference	36
Annex 2: Itinerary and list of people interviewed	45
Annex 3: List of main documentation reviewed.....	46

Executive Summary

Background

The development of the municipal energy efficiency project, which is the subject of this evaluation report, was initiated in the late 1990s, and the project brief submitted to the Global Environment Facility (GEF) in 1999. The UNDP GEF project was approved by the GEF on 15 March 2001 with a GEF grant of 750,000 USD and anticipated co-financing of 960,000 USD. Although the anticipated project duration was 3 years (meaning it would have finished in March 2004), a number of project delays resulted in it being finally closed on 31 December 2006. The project aimed to remove barriers to the improvement of the heat and hot water supply systems in Turkmenistan, thereby reducing energy consumption and the associated greenhouse gas emissions. The national executing agency for most of the project was the “Research Institute of the Municipal Infrastructure Development” under the Cabinet of Ministers of Turkmenistan. UNDP Turkmenistan supported the implementation of the project. The Project Management Unit was based at the Research Institute which operated a central project office in Ashgabat and a network of Local Project Coordinators in the 9 participating Project Cities: Ashgabat, Bayramaly, Balkanabat, Dashoguz, Khazar, Kone Urgench, Mary, Turkmenabat and Turkmenbashi. A consortium of Danish and German consultants (Ramboll and MVV Energy) provided international technical expertise, and was responsible for significant parts of the project activities.

Context and purpose of the evaluation

This final evaluation aims to contribute to ensuring proper documentation of lessons learned by assessing the relevance of the project, project performance (progress in terms of effectiveness, efficiency and timeliness), management arrangements focused on project implementation, and overall success of the project with regard to impact, sustainability, and contribution to capacity development. The evaluation assessed project synergies with other similar projects, evaluated the efficiency, relevance and sustainability of the financial instrument set up within the project, including its potential impact on leveraging co-financing, and makes recommendations for further development of the project.

Main conclusions, recommendations and lessons learned

Design

From the perspective of needs and priorities at the municipal level, and from a ‘quality of heat supply’ point of view, the project is highly relevant. There are two main reasons for this: the quality of the heating system, and the lack of policy and investment frameworks to facilitate improvements. On the other hand, since Turkmenistan has substantial gas resources there is very little national level priority given to reducing domestic consumption. Efficiency gains are of no direct interest to consumers since energy and heat prices are so low.

Evaluation - Municipal Energy Efficiency Project, Turkmenistan

Based on available information an objective assessment of information dissemination, consultation, and “stakeholder” participation in design stages cannot be made. However given the implementation difficulties with local ownership and the identification of implementation approaches, and the clearly inadequate stakeholder analysis given in the project document (even given the constraints of the working environment of the UNDP in Turkmenistan) there is significant room for improvement in this area.

The barriers identified in the project document were highly relevant at both the start and end of the project. However while the project addressed information barriers, the project *design* inadequately addressed the building of local capacity (working principally with Local Project Coordinators who were not energy specialists, and with no institutionalising of the capacity building activities), and did not engage with the main stakeholders in the institutional and financing areas. An analysis of project structure, based on the experiences during implementation, shows that the intervention logic contains a number of logical gaps, insufficiently defined objectively verifiable indicators, and a lack of logframe assumptions.

Implementation

The International Technical Advisor (ITA) played a highly significant role in the project. In the opinion of the evaluator over reliance on the external experts limited capacity building. Local stakeholders should have taken a more active role.

The project suffered from considerably delays right from the start: Following approval by the GEF in March 2001 the project document was signed only in July 2002 as a result of difficulty to identify a national counterpart and executing agency at the central level. Practical implementation of the project started in February 2003 as selection of project personnel was very slow. The project was then effectively closed between July and December 2004 because of problems with technical experience of the Project Management, and contrary interests of the executing agency. The executing agency of the project was changed in April 2004 from the Ministry of Energy to the Research Institute of Methodology and Municipal Services Development under the Cabinet of Ministers of Turkmenistan. Transferring the project to the Research Institute was logical and created a more solid foundation for project implementation and the possibility for follow-up. There were also significant delays in the appointment of the International Technical Advisor, and they were only appointed in mid-April 2004. Procurement of equipment for heat monitoring was also delayed, and eventually only delivered in June 2005.

Sustainability is of course a key issue in a project of this type, and a key part of this, in addition to approval of a national heating strategy, is the building of local capacity. However, with the notable exception of the Project Manager who is to be complimented for his high level of interest and enthusiasm, it seems that local ownership is not very high and capacity is not significantly higher now

Evaluation - Municipal Energy Efficiency Project, Turkmenistan

than before the project. It is highly questionable whether local people would be able to prepare parts of the Master Plans for example, and the quality of these seem to be entirely dependent on the expertise of the International Consultants.

Results

The major contributions of the project are:

- a. Training and training materials delivered to participating municipalities
- b. Monitoring in one boiler house in each city, and analysis of consumption
- c. A survey of attitudes to heating and heat supply in the participating cities
- d. Drafting of master plans and endorsement by municipalities ('adopted' but not implemented)
- e. Drafting of a national heating strategy, although it has not yet reached relevant stakeholders it could be of value in the future
- f. GIS development to enhance local heat supply planning

The GIS system development and supply of monitoring equipment in the participating municipalities may bring about ongoing benefits. The training guides, and strategic analyses carried out under the project are likely to continue to be used after the end of the project, but only once a national heating strategy is adopted. Apart from the drafting of the national strategy, no explicit activities, such as the institutionalizing of capacity building activities, were implemented to ensure ongoing sustainability of the project benefits. The project manager is now lecturing at the Polytechnic University in the Heat, Gas & Water Supply Department, and giving lectures on the related topics. UNDP intends to continue with the efforts to resubmit the Draft National Strategy, and is working to engage with Turkmengas. Other UNDP efforts include the proposed development of incentives for saving energy and building codes.

Main recommendations & lessons learned

Ongoing efforts in the heating sector will be needed to capitalize on the achievements of the project. There is a real danger that the advances achieved in the project will be lost without follow-up activities. A least-cost option might be to work with the Polytechnic University to develop further the training materials and offer courses to students and possibly other stakeholders. A training institute established within the University – possibly with a broader remit such as “Capacity building for Municipal Services and Management” could make cost effective use of the resources developed under the project. If possible this activity should be included in follow-up UNDP activities.

UNDP should make every effort to ensure that the Ministry of Foreign Affairs passes on the national strategy to relevant stakeholders. Ongoing efforts to get the draft national strategy into the hands of people within the gas sector are strongly recommended.

Evaluation - Municipal Energy Efficiency Project, Turkmenistan

For future activities addressing the heating and hot water sector, stakeholders from the Ministry of Gas, state concerns like Turkmengas, and the Ministry of Finance should, if possible, be involved, since they have both the resources and the incentive to improve energy efficiency in this sector.

Whether projects are logically designed or not, project managers should produce and maintain a logical framework with logical structure aimed as delivering project objectives, objectively verifiable indicators which can track delivery of activities and outputs, and risks/assumptions. These are essential management tools. Project management approach used should focus on both day-to-day activities, as well as bigger picture.

Where governments are not already intending to develop policies and legislation, projects cannot guarantee to produce results. The timing of policy and legislation development cannot be programmed into a project workplan.

Sufficient resources should be allocated to monitoring and analysing project impacts. This will assist daily management. Baseline monitoring is also essential for the determination of impacts.

Efforts should be taken to ensure local ownership in every project activity. International consultants should be in a support not a lead role. If local capacity does not exist to lead activities, this capacity should be built as a matter of urgency.

For future activities addressing the heating and hot water sector, stakeholders from the Ministry of Gas, state concerns like Turkmengas, and the Ministry of Finance should, if possible, be involved, since they have both the resources and the incentive to improve energy efficiency in this sector.

Introduction

This report contains a final evaluation of the UNDP-GEF Medium Scale Project “Improving Energy efficiency in the heat and hot water supply system in Turkmenistan” (project number TUK/01/G35).

The evaluation was carried out by Grant Ballard-Tremeer of Eco, a UK based consultant firm specialized in project development, monitoring and evaluation, and knowledge management. A visit was made to Turkmenistan by the international evaluation expert between 15 to 23 July 2007 and interviews with relevant project stakeholders, including municipal representatives, individual project beneficiaries, implementing agency, project executing agency, project staff and others were made. The Terms of Reference for the assignment are given in Annex 1.

This final evaluation aims to contribute to ensuring proper documentation of lessons learned by assessing the relevance of the project, project performance (progress in terms of effectiveness, efficiency and timeliness), management arrangements focused on project implementation, and overall success of the project with regard to impact, sustainability, and contribution to capacity development. The evaluation assessed project synergies with other similar projects, evaluated the efficiency, relevance and sustainability of the financial instrument set up within the project, including its potential impact on leveraging co-financing, and makes recommendations for further development of the project.

The approach used for the evaluation was based on the results-oriented ‘outcome evaluation’ approach within the framework of Results Based Management. This approach generally covers a set of related projects, programmes and strategies intended to bring about outcomes¹. In this case, the focus of the review was a single project. The evaluation thus focuses more on the UNDP contribution to the outcome through the project outputs, and possible improvements that could be made to increase the performance of delivery of outputs and ultimately the desired outcomes.

Details of the people interviewed and the documents reviewed are given in the lists in annex 2 and 3. Local operational and technical project staff as well as the UNDP-GEF project staff in Turkmenistan gave excellent support during the evaluation. Special thanks are due to the Project Manager, Mr Arslan Zomov, and interpreter, Mrs Delara Nadji-Alikperova, for their efforts throughout the evaluation.

¹ An outcome evaluation focuses on the ‘developmental changes between the completion of outputs and the achievement of impact’ (the outcomes), and encompasses efforts of partners working on the same issues. The evaluation assesses how and why outcomes are or are not achieved within a given context, and the role that UNDP has played in bringing these about. Outcome evaluations also help to clarify underlying factors affecting the situation, highlight unintended consequences, recommend actions to improve performance in future programming, and generate lessons learned.

I. The project and its development context

Background

1. The UNDP has worked with the Government of Turkmenistan supporting sustainable human development since 1993. The development of the municipal energy efficiency project, which is the subject of this evaluation report, was initiated in the late 1990s, and the project brief submitted to the Global Environment Facility (GEF) in 1999. Building on earlier actions in the environmental sector, the project comes under the current “Programme Component C: Environment” of the UNDP Country Programme Action plan for 2005-9.
2. The provision of heat and hot water to the population is under the responsibility of local municipalities with most heating in large cities provided by centralised district heating systems. Most boilers and CHP units are gas-fired. According to government policy both at the time of project preparation and at the time of the evaluation, heat, gas and electricity is provided practically free of charge to residential consumers². The subsidy is applied before gas is supplied to the municipalities for use in heating, and there is thus no incentive for gas saving at the municipal or household level. There are significant losses in heating systems, estimated at over 50%. According to a recent project briefing (May 2007), municipal heat and hot water supply contributes some 10% of the total CO₂ emissions in Turkmenistan.
3. Turkmenistan’s per capita natural gas reserves are among the highest in the world. In addition to natural gas, Turkmenistan has considerable oil reserves. The key issue for the gas industry concerns the development of adequate gas pipelines for export. Depending on whether demand for export outstrips available supply there is an incentive for gas saving in Turkmenistan because of the opportunity cost of gas that could be sold for hard currency. Saving of gas would in most cases be economically justified, and of most direct interest to the Ministry of Gas and the various state supply companies, in particular Turkmengas.
4. The UNDP GEF project was approved by the GEF on 15 March 2001 with a GEF grant of 750,000 USD and anticipated co-financing of 960,000 USD. Although the anticipated project duration was 3 years (meaning it would have finished in March 2004), a number of project delays resulted in it being finally closed in December 2006. The project aimed to remove barriers to the

² Free power below 35 kWh/person/month, Free water below 250 l/person/day, Free gas below 50 m³/person/month, and heat tariffs of only 10 TMM / m²/month (approx one fifth of a US cent per square meter per month!)

Evaluation - Municipal Energy Efficiency Project, Turkmenistan

improvement of the heat and hot water supply systems in Turkmenistan, thereby reducing energy consumption and the associated greenhouse gas emissions.

5. The national executing agency for most of the project was the “Research Institute of the Municipal Infrastructure Development” under the Cabinet of Ministers of Turkmenistan. UNDP Turkmenistan supported the implementation of the project. The Project Management Unit was based at the Research Institute which operated a central project office in Ashgabat and a network of Local Project Coordinators in the 9 participating Project Cities: Ashgabat, Bayramaly, Balkanabat, Dashoguz, Khazar, Kone Urgench, Mary, Turkmenabat and Turkmenbashy. A consortium of Danish and German consultants provided international technical expertise, and was responsible for significant parts of the project activities.

Project outcomes and objectives

6. The overall development goal of the project (the project outcome for GEF) was “to remove barriers to improving the energy efficiency of the municipal heat and hot water supply in Turkmenistan, thereby lowering the overall fossil fuel consumption and greenhouse gases emissions.”
7. These goals / outcomes were to be achieved through this project by addressing institutional, financial, and information and capacity barriers to energy efficiency in the heat and hot water sector.
8. The barriers being addressed by this project, as described in the Project Document include:
 - *Information and capacity barriers*
 - Lack of information on modern, energy efficient heat and hot water supply technologies;
 - Lack of local capacity to prepare feasibility studies and master plans taking fully into account the energy efficiency and GHG reduction aspects (on which the decisions to invest on energy efficiency could be based);
 - Lack of experience and information on the applicability and the costs of different technical solutions to improve the energy efficiency of the heat and hot water supply systems in Turkmenistan; and
 - Lack of information on and awareness of the national economic benefits of improving the energy efficiency of the heat and hot water supply systems.
 - *Institutional and financial barriers*
 - Lack of enabling mechanisms to implement the agreed energy saving policies and strategies;

Evaluation - Municipal Energy Efficiency Project, Turkmenistan

- Lack of incentives and appropriate institutional structures (e.g., co-operatives, home-owner association etc.) to improve the demand side energy efficiency within the buildings;
 - A complex cost-sharing and subsidy system between the end users, local municipalities and the federal government, which in its current form does not encourage and facilitate the investments in energy efficiency.
9. To overcome these barriers to energy efficiency the UNDP/GEF project was designed with two main project objectives:
- To identify opportunities for, to enhance public awareness of, and to strengthen the capacity in municipalities to establish sustainable energy policy.
 - To establish a supportive institutional and financial framework for implementing the identified opportunities at the national level.
10. From those objectives, there were several proposed project elements (outputs):
- The pilot project in the city of Turkmenabad successfully launched and the results and the lessons learned from this project compiled, analysed and disseminated (Output 1.1).
 - Pre-feasibility studies and draft master plans for improving the energy efficiency of the existing heat and hot water supply systems in the participating municipalities and enhanced capacity of the local experts to prepare these studies (Output 1.2).
 - Adoption of the master plans for energy efficiency in the heat and hot water supply sector of the participating municipalities (Output 1.3).
 - Draft concept for the establishment of consumption based billing system and for a revised tariff structure reflecting the full costs of the service (Output 2.1).
 - A guidebook on project preparation and financing and recommendations for the legal and regulatory changes needed to facilitate the financing of the projects (Output 2.2).
 - Adoption of a National Heat Strategy (Output 2.3).

Key stakeholders and beneficiaries for this outcome

11. The project document identifies the following stakeholders:
- Government of Turkmenistan, in particular the Ministry of Economy and Finance which is responsible for state budget allocation to municipalities
 - The National Commission for Implementation of the UN Environmental Conventions and Programmes (CIC)

Evaluation - Municipal Energy Efficiency Project, Turkmenistan

- The Ministry of Environment Protection
 - Local administration and agencies (including Municipalities), as well as regional (Velayat) branches.
12. To this, other key stakeholders and sub-groups include:
- Cabinet of Ministers (Develops strategy for the oil and gas sectors. The Committee on Oil and Gas Industry and Mineral Resources functions within the Cabinet structure. The Committee directly supervises the activities of Turkmengas and other state concerns, and the Ministry of the Oil and Gas Industry and Mineral resources of Turkmenistan.)
 - Ministry of Oil and Gas Industry and Mineral Resources (responsible for exploitation and utilization of oil and gas resources)
 - State Concern Turkmengas (conducts exploration, drilling, development, production and processing of gas and gas condensate throughout the entire territory of Turkmenistan, as well as transportation of gas)
 - State Trading Corporation Turkmenneftegas (markets hydrocarbon resources, processes the raw materials and exports the output. In addition Turkmenneftegas provides fuel resources to local consumers)
 - The Research Institute for Municipal Infrastructure Development under the Cabinet of Ministers of Turkmenistan (recently dissolved and incorporated into the Ministry of Construction)
 - The administration of the nine participating municipalities³
 - Heat and hot water consumers in those municipalities
 - Municipal technicians and planners
 - Decision-makers in district heating companies (heat supply utilities)
 - Decision-makers of local industries and power plants situated nearby the cities to where surplus heat could be distributed.

³ Turkmenistan is divided into administrative units, which have been given authority of self-government, these are the velayats (large administrative regions encompassing etraps, and specific cities), etraps (districts), shakhers (cities), oba (villages) and gengeshlik (main administrative units).

II. Findings and Conclusions

13. The discussion that follows covers the current status of the project outcomes, and reviews key factors that affect the achievement of the project outcomes.

A. Project formulation (relevance & design)

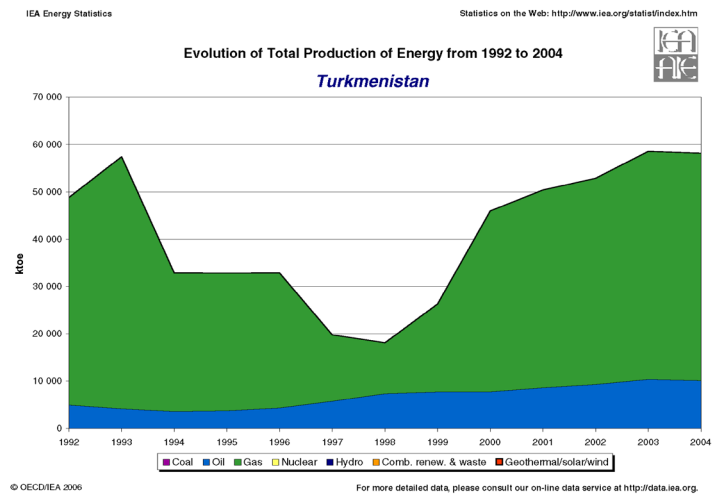
Relevance to local and national development priorities

14. From the perspective of needs and priorities at the municipal level, and from a 'quality of heat supply' point of view, the project is highly relevant. There are two main reasons for this: the quality of the heating system, and the lack of policy and investment frameworks to facilitate improvements. On the other hand, since Turkmenistan has substantial gas resources there is very little national level priority given to reducing domestic consumption. Efficiency gains are of no direct interest to consumers since energy and heat prices are so low (see paragraph 3 above). These issues are discussed in more detail below.
15. The heating system of Turkmenistan was mostly constructed in the 1950s and 1960s and is predominantly of the district heating type with hot water, and very uniform designs and low efficiency based on coverage of demand, and low levels of automation. Maintenance levels are generally low, and minimal amounts have been spent within the boiler houses and in the distribution network. Temperatures vary widely in the buildings connected to the district heating networks with lower floors frequently overheated and upper floors under heated. The main district-heating network directly feeds the building circuits, and heat exchangers in the buildings are not used. As a result of poor balancing and in an attempt to draw hot water into the radiators many households drain water from the radiators (and in some cases use the hot water), and water losses from the system are thus substantial. Since water losses are great water treatment levels are not maintained, and calcium deposits are thus increasingly blocking pipes, further reducing system efficiency. There is thus a significant need for improvements in the quality of the heating systems, which would bring about efficiency gains.
16. At the time of project development Turkmenistan was "in the process of formulating a strategy and framework conditions to support reliable district heating and hot water supply". This strategy development however has not addressed the issue of investments in municipal infrastructure, and did not effectively address approaches to make district heating more efficient and reliable. Thus the

Evaluation - Municipal Energy Efficiency Project, Turkmenistan

present situation where municipalities do not have access to resources for investment appears to be the same as when the project was designed.

17. Turkmenistan was a substantial natural gas producer under the Soviet Union, but after the country became independent, Turkmen natural gas became a competitor with Russian natural gas. Since Turkmenistan's only natural gas export routes ran through Russia, Gazprom limited Turkmen natural gas exports, and as a result Turkmenistan's natural gas production sagged throughout the 1990s. Following the resolution of a pricing dispute with Russia in 1998 and the construction of an export pipeline to Iran, Turkmenistan's natural gas production began to climb steadily (see accompanying figure). By construction of new international gas pipelines the gas exports have potentials to expand considerably. Proposals include a gas pipeline to Europe via the Caspian Sea, Azerbaijan and Georgia, thus bypassing Russia, or a gas pipeline to India via Afghanistan and Pakistan. In April 2006 an agreement was signed with China to supply gas, and a pipeline to China is due to open in 2009.



18. Low priority to energy savings and energy efficiency by the government has so far been the logical consequence of significant gas resources. Since domestic energy in Turkmenistan is essentially there are no strong incentives to realize energy savings. Free energy is regarded as a social benefit provided by the state to the population.
19. Since oil and natural gas are sold in Turkmenistan at fixed prices that are well below world market levels, Turkmenistan must solve the problem of getting its natural gas to consumers, as well as getting paid in hard currency. The country has been unable to capitalize on its natural gas resources because it lacks pipeline outlets to world markets. As a result, Turkmenistan is forced to sell its natural gas to ex-Soviet states that either cannot pay fully in cash or are tardy with payments for supplies already received⁴. The gas export price in January 2005 was USD 44 per 1000 cubic meters from January 2006 USD 65 per 1000 cubic meters. According to the Master Plans developed during the project, as the current price is significantly lower than the average price on world markets, and as the cost of gas production is increasing, negotiations about a gas price hike are underway.

⁴ Turkmenistan profile from INOGATE (www.inogate.org)

Evaluation - Municipal Energy Efficiency Project, Turkmenistan

20. There are no expectations that Turkmenistan will introduce a similar revitalization of the housing communal service sector like in the Russian Federation. Western or Russian experiences on operating district heating companies on commercial basis are not directly relevant at the moment in Turkmenistan. With the strong role of the state in Turkmenistan the focus could be on how subsidies can be used to promote economic and environmental benefits for the society.

Relevance to target groups

21. The general project aims are generally relevant to local development priorities of municipalities as has been described above. From the perspective of municipalities some of the specific project deliverables are immediately relevant. Others, however, are not relevant although they may become relevant in the future should the national policy framework in the heating sector change substantially. The relevance to municipalities can be summarized in the following table:

Key Deliverable	Relevant now	Relevant in the future (assuming national strategy adoption)
Training	✓	✓
Monitoring & analysis		✓
Master Plan development		✓
Financing guide		✓
National Strategy adoption	✓	✓
GIS development	✓	✓

22. Although Master Plans are not immediately relevant to municipalities they are highly relevant at a national level and are justified by their demonstration value. It is clear that current problems of heat supply in Turkmenistan can be solved only by a long-term investment strategy at a local municipal level.

23. The 9 chosen municipalities include a number that are very small and in very dry desert regions with restricted access, including Hazar and Kunhne Urgench. The selection of these cities appears to stem from the intended linking between this project and the 2nd Phase of the UNDP Municipal Service Development Programme that focused on Water Supply and Solid Waste Management. Unfortunately with the second phase project not going ahead, the selection of cities was no longer fully relevant, and larger industrial cities may have been better choices.

24. From the analysis of relevant stakeholders (see paragraphs 12 and 13 above) and the importance of natural gas in the heating and hot water sectors it is notable that no representatives of the gas sector are mentioned in the GEF project document. This is a serious design shortcoming.

Evaluation - Municipal Energy Efficiency Project, Turkmenistan

25. *Rating of stakeholder participation:* Based on available information an objective assessment of information dissemination, consultation, and “stakeholder” participation in design stages cannot be made. However given the implementation difficulties with local ownership and the identification of implementation approaches, and the clearly inadequate stakeholder analysis given in the project document (even given the constraints of the working environment of the UNDP in Turkmenistan) there is significant room for improvement in this area.

Project design

26. The project document identifies information, capacity, institutional and financial barriers to energy efficiency in the heating and hot water sector (see paragraph 9 above). Reviewing the barriers identified it appears that they were highly relevant at both the start and end of the project. However while the project addressed information barriers, the design inadequately addressed the building of local capacity (working principally with Local Project Coordinators who were not energy specialists, and with no institutionalizing of the capacity building activities), and did not engage with the main stakeholders in the institutional and financing areas.

27. The project document includes a brief Project Planning Matrix. An analysis of this structure, based on the experiences of project implementation, shows that the intervention logic contains a number of logical gaps, insufficiently defined objectively verifiable indicators, and a lack of logframe assumptions.

28. No assumptions whatsoever were given in the Project Planning Matrix contained in the Project Document. Thus, according to the intervention logic of the logframe approach, there were no factors outside the control of the project team to the success of the project. This is clearly unlikely, and in reality, during project implementation a significant number of major project assumptions became apparent. Since these appear not to have been taken into account during project design, no mitigating strategies were explored, and essential project activities, in retrospect, appear to be missing. Examples include:

- a. Output 1.3 (“Adoption of the master plan for each participating municipality”) assumes that seminars and awareness-raising activities aimed at “presenting and discussing results of the work” would lead to adoption. However, municipalities do not have resources for investment, and are not able to plan and carry out investment plans in the heating sector. While ‘Master Plans’ are arguably essential to ensure cost effective municipal investments in the heating sector (making clear the costs and priorities), in the words of more than one interviewed municipal stakeholder “we already knew many of the

Evaluation - Municipal Energy Efficiency Project, Turkmenistan

actions proposed in the Master Plan, but we don't have the finance to make any investments".

- b. The activities under Output 2.1 ("Draft concept for consumption based billing system and revised tariff structure") were largely skipped during project implementation on the advice of the National Project Coordinator
- c. Outputs 1.3, 2.1, 2.2 are entirely dependent for any meaningful success on Output 2.3 ("Adoption of a national heat strategy by the Government of Turkmenistan"), yet the project planning matrix overlooks this assumption. Commenting on the 'Financing Guide', for example (Output 2.2), some stakeholders emphasized that this was "not usable at the municipal or company level", and thus, essential assumptions have been overlooked.

29. Concerning 'objectively verifiable indicators', the project objectives, outputs and activities frequently do not include good indicators. This means that it was difficult for the project team to implement and assess progress for these activities, and difficult to evaluate success or failure. Indicators should reflect the desired Quantity, Quality and Timeframe. All project objectives, outputs and activities would have benefited from being reformulated in verifiable and quantifiable terms that reflect successful achievement of the results. This would have facilitated project execution as well as monitoring and evaluation. For Output 1.3 the indicator given is "Master Plans Adopted", but it arguable what this really means. A good example pertains to Output 2.2 where the objectively verifiable indicator is "A guidebook on project preparation and financing published". This indicator does not specify quality, quantity or time aspects of success (although in this case it is easily 'objectively verifiable'), but more importantly does not reflect a successful result of the proposed activities (which include such actions as "preparing investment opportunity presentations for business meetings" (or, in the Russian version of the Project Document, "help support municipalities to organize financing for investments"))).

30. In terms of gaps in intervention logic a number of examples can be highlighted:

- a. Outputs 2.1, 2.2 and 2.3, which focus on drafting a concept for consumption based billing, a guidebook on project preparation and financing, and adoption of a national heat strategy respectively, are not necessary and sufficient for the achievement of the Intermediate Objective 2 (establishment of supportive institutional and financial framework in each participating municipality, the indicator being financed and implemented projects in each municipality). That is, assuming that the outputs are achieved, there is no certainty that the objective can be achieved since there are external conditions that have not been addressed in the project design.
- b. More importantly perhaps, as mentioned above outputs 1.3, 2.1, 2.2 are entirely dependent for any meaningful success on the adoption of a national heat strategy (Output

Evaluation - Municipal Energy Efficiency Project, Turkmenistan

2.3) yet the adoption was scheduled at the end of the project, and the dependent outputs are not connected in the logframe. Such a project design is highly risky, and the project suffered in implementation as a result of this.

31. Although not usually included in logframes as explicit project intervention logic, current best practice includes the identification of indicators at a level between objectives and outputs, as “use of outputs”. The lack of such indicators in the project logframe is symptomatic of gaps in the intervention logic.
32. The project document lists “possible failure in ensuring the follow-up in terms of concrete investment projects” as the major project risk. In terms of replication, this appears to have been expected to follow naturally from successful implementation of the project. No-doubt if a supportive national heating strategy had been adopted at the highest levels this would have been the case to a large extent. There is no explicit provision for sustainability of project activities (eg. no institutionalization of capacity building).
33. To maximize the chances of success clear and appropriate management arrangements should be present at the design stage. The project document acknowledges the importance of project management (“in a project of this complexity a committed and top quality project management is absolutely essential for the success of it”). However the project document fails to live up to this ideal. Difficulties include:
 - a. Executing agency selection – an initial difficulty was encountered immediately on approval of the project to identify a national counterpart at the central level, as there was no Ministry or Department directly dealing with the heating and hot water supply, strategy and management. This caused a 6-month delay at the time of project kickoff.
 - b. The initial executing agency (the Ministry of Energy) was eventually changed, along with National Project Coordinator as a result of poor structural linkages between the Ministry of Energy and the heating sector.
 - c. Qualifications and selection of project personnel – the Local Project Co-ordinators were used in the project were, in most cases, adopted from the Municipal Service Development Programme, and have a water rather than energy background. This was clearly intentional since the Local Project Co-ordinators would need to work very closely with the Municipalities and this was considered more important than their energy knowledge. However during evaluation it was clear that local ownership was strongly influenced by the interests of the Local Project Co-ordinators.
34. The overall rating of Conceptualization/Design: *Unsatisfactory*

Evaluation - Municipal Energy Efficiency Project, Turkmenistan

B. Implementation

Implementation approach

35. There is no evidence that the logical framework was used as a management tool during project implementation, and the project team did not appear familiar with the logical framework given in the project document.
36. Instead, a project report was prepared for each quarter that listed activities carried out over the previous quarter, and proposes activities for the next quarter. It appears that these activities were mainly aimed at delivering activities and outputs. These quarterly work plans are fairly comprehensive in detail, but do not explicitly link the proposed activities to the overall intervention logic. The project logic is not apparent in the management reports.
37. Adaptive management such as comprehensive and realistic work plans were routinely developed as described above. There is evidence of significant adaptive management, including:

- a. Changes in management arrangements to enhance implementation:

From 27 June 2002 to 30 March 2004 the Implementing Agency was Ministry of Energy and Industry of Turkmenistan. This was changed from 1 April 2004 to the Research Institute of the Municipal Economy Methodology and Development under the Cabinet of Ministers of Turkmenistan

- b. Changes in activities compared to those planned in the project document:

During the course of project implementation, the project management decided to change some project activities (eg Activity 2.3.2 on holding workshops on the national strategy).

A number of relevant activities were added to the project, namely “Selection of GIS specialist”, “Purchase of computer equipment for GIS”, and “Training of the LPC on GIS program and creation of GIS in the Heat Supply System.”

In retrospect these adaptive changes could have been even more vigorous in execution to ensure better project implementation. It is however clear that while adaptive management was implemented where possible it faced difficulty due largely to institutional complications, and somewhat due to lack of experience and knowledge.

Evaluation - Municipal Energy Efficiency Project, Turkmenistan

38. Most project materials are available in electronic format, but electronic information technologies were not a key tool to support implementation, participation and monitoring of the project. However the limited use of these tools appears to have been appropriate to the development needs and equipment available in Turkmenistan generally and in particular in the municipalities. The GIS component added to the project during implementation depended on the purchase of computers and relevant training.
39. The International Technical Advisor (ITA) played a highly significant role in the project. The project management reports (APR) underline the importance given to the international experts by stating: "At present the main negative factor affecting the achievement of project results is that the International Technical adviser has not been selected yet. In this connection the project is not able to conduct any actions such as major part of activities should be carried out by the ITA."

The major part played by the international experts is not, however, explicitly defined in the project document (where they are given more of a supporting role), and, in the opinion of the evaluator over reliance on the external experts limited local capacity building. A management review in the middle of the project (2004) identified this problem and attempted to address it: "As regards the Project Management Unit (PMU), it is encouraged to take a more active role in initiating and clarifying the things at the local level so as to facilitate effective implementation and successful completion of the project activities. Although many of the activities have been pending the selection of the ITA, there are many others, which could have been started even without the direct involvement of the ITA. These include further review and clarification of the role the different local institutions could play in supporting the project activities, clarification of available local possibilities to produce certain technical outputs (such as detailed heat maps in a digital form), clarification of the most feasible strategy for and initiating the design of the project public awareness raising components (for instance, by building on the work started under the earlier UNDP Municipal Development Project), identification and review of other projects and initiatives that could be of relevance to the project, etc. In general, it will be crucial for the sustainability and success of the project that the PMU fully understands the overall objectives of the project and actively initiates and promotes measures that support those objectives."

There is no evidence, however, that this balance of roles and responsibilities was successfully addressed. Thus the International Technical Advisors 1) Reviewed the pilot project, 2) Defined and prepared much of the training, 3) Defined the monitoring programme, 4) Carried out the pre-feasibility studies, 5) Prepared master plans for each city, 5) Prepared the guidebook on financing, and 6) Drafted the national strategy. Local consultants were in a supporting role.

Evaluation - Municipal Energy Efficiency Project, Turkmenistan

40. As described earlier (see paragraph 31 above) the project intervention logic is designed so that each part builds on the previous parts: the pilot project in Turkmenabad, including monitoring and lessons learned and monitoring system / energy audits in key cities, lead to the development of Master Plans for investments in each city, which in turn supports work on institutional and financial frameworks including the National Heating Strategy. However, a review of the Master Plans – for example – does not show much evidence of the monitoring and energy audits. The design data in the "measures and pre-FS" seems to come from 2002, and not from monitoring carried out during the project. This may be a result of the procurement delays already discussed, but it is clear that later activities do not build substantially on earlier activities, and the project logic has been partially lost.
41. Overall rating of Implementation Approach: *Marginally satisfactory*

Management arrangements

42. As reported in other reviews, the negotiation and agreement of documents with the government requires a lengthy bureaucratic process because of a strict hierarchy, centralized decision making and a system of internal checks and controls within the government structures. At the same time there was a lack of internal coordination and information flow within the government ministries/agencies. The International Organisations department, the main UN counterpart at the Ministry of Foreign Affairs appears to be understaffed and lacks capacity to coordinate the whole workflow between the UN agencies and their national partners efficiently⁵.
43. The project suffered from considerably delays right from the start: Following approval by the GEF in March 2001 the project document was signed only in July 2002 as a result of difficulty to identify a national counterpart and executing agency at the central level, as there was no Ministry or Department directly dealing with the heating and hot water supply, strategy and management. This difficulty reflects the lack of substantial stakeholder engagement during project development.
44. Following signing delays continued: practical implementation of the project started in February 2003 as selection of project personnel was very slow.
45. The project was then effectively closed between July and December 2004 because of problems with technical experience of the Project Management, and contrary interests of the executing agency, the Ministry of Energy. The executing agency of the project was changed in April 2004 from the Ministry of Energy to the Research Institute of Methodology and Municipal Services Development under the Cabinet of Ministers of Turkmenistan. Transferring the project to the Research Institute

⁵ UNDAF Joint Annual Review Meeting 2005

Evaluation - Municipal Energy Efficiency Project, Turkmenistan

was logical and created a more solid foundation for project implementation and the possibility for follow-up. The National Project Coordinator, Technical Steering Committee and Project Manger were also changed⁶.

46. There were also significant delays in the appointment of the International Technical Advisor. The deadline for Expressions of Interest for International Technical Advisor was issued in March 2003, the deadline for request for proposals was July 2003, proposals were opened in September 2003, and the contract signed with the selected consortium in mid-April 2004. The consortium consisted of the Danish consultancy company Ramboll and the German consultancy company MVV Energie, with Ramboll as consortium leader.
47. Delays were also experienced in the technical specification and procurement of equipment for heat monitoring. The procurement request was submitted to UNDP in September 2004 (with the intention of installing it for the 2004-5 heating season) and equipment only delivered in June 2005. During the inception phase of the activities of the International Technical Advisor was agreed with UNDP to shorten their activities from 2 years to approximately 1 year. However in the end activities continued into 2006.
48. Management reviews identified procurement difficulties: “the experience with the recruitment of ITA is nevertheless suggesting that specific attention during further project implementation needs to be placed on an effort to facilitate timely procurement of especially all those goods and services that need to go through the full tendering process. The next critical step in that regard will be the purchase of the measuring and monitoring equipment that need to be installed before the start of the next heating season (October-November, 2004).” This warning however was unsuccessful in avoiding the delays with procurement of monitoring equipment.
49. Since the approval of the project, some changes also took place in the planned project implementation arrangements. The 2nd phase of the UNDP Municipal Service Development Project, on the basis of which the GEF energy efficiency project was originally built on, was cancelled. This also affected the project’s financing structure, since part of the co-financing of the GEF project was envisioned to come through the 2nd phase of the Municipal Service Development Programme.
50. In terms of daily management, a quarterly meeting of the Project Manager and Local Project Coordinators was held in Ashgabad, a quarterly workplan prepared, and phone calls held between the Project Manager and Coordinators “every few days”. It could be argued that the ‘bigger picture’

⁶ Since the end of the project this institute has unfortunately been merged into a Research Institute of the Ministry of Construction, and much continuity appears to have been lost.

Evaluation - Municipal Energy Efficiency Project, Turkmenistan

in which the Project Manager fully understood the overall objectives of the project and actively initiated and promoted measures that support those objectives was overlooked.

Stakeholder participation

51. Municipal stakeholders found the project “useful” and were generally happy with it, although there was some disagreement expressed with the conclusions of the Master Plans and the order of investments proposed.
52. Sustainability is of course a key issue in a project of this type, and a key part of this, in addition to approval of a national heating strategy, is the building of local capacity. However, with the notable exception of the Project Manager who is to be complimented for his high level of interest and enthusiasm, it seems that local ownership is not very high and capacity is not significantly higher now than before the project. It is highly questionable whether local people would be able to prepare parts of the Master Plans for example, and the quality of the these seem to be entirely dependent on the expertise of the International Consultants.
53. The relevance of the Master Plans depends on changes at a macro-economic level and adoption of a National Heat Strategy, yet these changes appear to have hardly been addressed by the project apart from the drafting of the strategy. The Strategy itself appears not to have been read by relevant stakeholders since it is currently within the Ministry of Foreign Affairs. Originally this was a substantial design risk as pointed out in paragraph 31, and unfortunately the project seems to have fallen victim to it.
54. The Local Project Coordinators interviewed during the evaluation felt that they had “learned many things during the study tour in Germany”. The coordinators also identified the training in GIS and the explanations of the master plans as being valuable to them.
55. There was a very evident high level of interest in Mary in the GIS planning approaches and it was clearly being used after the end of the project on an ongoing basis. It was seen as a tool for monitoring and maintenance of the district-heating network and was highly valued by the district heating company. However this was not the case in the neighbouring city Bayramaly where the GIS was not being used. The difference could be down to priorities of management within those cities.
56. In both municipalities local stakeholders expressed a lack of interest / incentive to continuing with monitoring of the boiler house, with the argument “why continue to monitor and analyse data without a national heating strategy”. The Project Manager in Ashgabad carried out analysis of data. Local stakeholders also stated that: “local authorities don’t need this data”.

Evaluation - Municipal Energy Efficiency Project, Turkmenistan

57. As noted earlier, Local Project Co-ordinators used in the project were, in most cases, adopted from the Municipal Service Development Programme, and had a water-sector background. During evaluation it was clear that local ownership was strongly influenced by the interests of the Local Project Co-ordinators. In addition some interviewees expressed the opinion that key specialists in Heat Supply were not involved in the project. Coordinators interviewed appeared to have returned to the water sector following the end of the project.

58. Overall rating of Stakeholder Participation: *Satisfactory*

Monitoring and evaluation

59. Quarterly progress reports and workplans were prepared by the Project Manager and approved by the National Project Coordinator and UNDP, and this appears to have been satisfactory. The National Project Coordinator clearly had a good grasp of the local project constraints and appears to have guided the project effectively within these limitations.

60. No mid-term evaluation was originally planned and none took place. Two visits on behalf of the UNDP regional office were however made to the project in February 2003 and May 2004 to support the UNDP Turkmenistan office. These were at crucial times and appear to have been valuable, although not all recommendations were taken up in project implementation.

61. It is striking that no mechanism was put in place to track systematically the impacts on energy use / saving and GHG emission reductions. Thus no figures are available on emission or energy savings although this was the development objective of the project. This however does reflect the lack of concrete emission reduction targets in the original proposal.

62. Overall rating of Monitoring and Evaluation: *Marginally satisfactory*

Financial Planning

63. Costs were managed using standard UNDP rules and procedures, and the GEF budget of 750,000 USD was fully used. An annual financial audit was carried out according to international best practice. Budget expenditure was tracked by input budget lines, not by activity, and thus expenditures by activity, output and objective cannot be assessed.

64. The co-financing expenditure was not tracked, including that of the UNDP. Since the Danish investment in Turkmenabad took place the 450,000 USD allocated is likely to have been realized

Evaluation - Municipal Energy Efficiency Project, Turkmenistan

(although this was not verified). According to the UNDP project officer the UNDP co-financing of 110,000 USD was well allocated as co-funding to the Turkmenabad project before the start of the GEF activities, although no evidence of this was reviewed by the evaluator. Government co-financing of 400,000 USD may have been partially covered on an in-kind basis – the Municipalities, for example, provided office space for the Local Project Coordinators.

C. Results

Impact

65. The project's overall objective was "to remove barriers to improving the energy efficiency of the municipal heat and hot water supply in Turkmenistan, thereby lowering the overall fossil fuel consumption and greenhouse gases emissions." However, as mentioned earlier, overall GHG savings from the project were not tracked. The project manager has however made estimates of savings from the energy management activities in the monitored boiler house in Mary city from heating season 2005-6 to 2006-7, 13790 m³ of natural gas were saved even though the 2006-7 season was colder than the 2005-6 one, reducing the greenhouse gases by 26 t of CO_{2eq}. If this figure were used to rate cost effectiveness it would naturally be very low.

66. The major contributions of the project are:

- a. Training and training materials delivered to participating municipalities
- b. Monitoring in one boiler house in each city, and analysis of consumption
- c. A survey of attitudes to heating and heat supply in the participating cities. This was an excellent and well-executed action, and represents the first such survey of attitudes in Turkmenistan
- d. Drafting of master plans and endorsement by municipalities
- e. Drafting of a national heating strategy, although it has not yet reached relevant stakeholders it could be of great value in the future
- f. GIS development to enhance local heat supply planning

Assessment of project deliverables

67. Progress in project implementation against outcomes and activities is shown in the following table:

OUTCOMES & ACTIVITIES	INDICATORS	STATUS	RATING*
-----------------------	------------	--------	---------

Evaluation - Municipal Energy Efficiency Project, Turkmenistan

OUTCOMES & ACTIVITIES	INDICATORS	STATUS	RATING*
<i>Development Goal: To remove barriers to improving the energy efficiency of the municipal heat and hot water supply in Turkmenistan, thereby lowering the overall fossil fuel consumption and greenhouse gases emissions.</i>	The greenhouse gas emissions from the heat and hot water supply reduced (<i>project brief states: A direct reduction of GHG emission through the two pilot projects: 0.01 MtC over the next 10 years (before 2010). An envisioned long term impact: The reduction of GHG emissions to the estimated amount of 0.2–0.5 MtC within next 20 years (by the year 2020)</i>)	Overall GHG savings from the project were not tracked. Estimates of savings from the energy management activities in the monitored boiler house in Mary city from heating season 2005–6 to 2006–7, 13790 m ³ of natural gas were saved even though the 2006–7 season was colder than the 2005–6 one, reducing the greenhouse gases by 26 t of CO _{2eq} ⁷	U
Immediate Objective 1: To identify opportunities for, to enhance public awareness and to strengthen the local capacity to establish sustainable energy policy	Investment proposals prepared following the modern approaches and standards to improve the energy efficiency of the heat and hot water supply systems	Investment proposals ('Master Plans') were developed for 9 cities	S
<i>Output 1.1 The pilot project in Turkmenabad launched, the results compiled, analysed and disseminated</i>	Report on the results and lessons learned from the pilot project(s) in Turkmenabad	Lessons learnt from the pilot project were documented, and a workshop held to discuss results. Details about the investment, GHG and energy savings from the Turkmenabad pilot project do not appear to have been made available.	U
Activities: 1.1.1 Preparing a review of the existing situation		A short report on the Turkmenabad pilot project was prepared by the international consultant RAMBØLL in June 2004	U
1.1.2 Establishing a monitoring program and compilation of the data		The monitoring program in Turkmenabad was carried out for the 2004–5 and 2005–6 heating seasons along with the other cities	U
1.1.3 Analysing the information + preparing a report		A brief report was prepared in April 2005	MS

⁷ This gas saving come about through the use of a temperature chart in the 2006-2007 heating season (no other actions).

Evaluation - Municipal Energy Efficiency Project, Turkmenistan

OUTCOMES & ACTIVITIES	INDICATORS	STATUS	RATING*
1.1.4 Disseminating the information		A workshop to disseminate results of the Turkmenabad pilot project was held on 21–22 October 2004. On 15 and 20 January 2005 a 1 minute TV clip was broadcast on the project on TV4. The project manager gave lectures on the results of the monitoring programme from the Turkmenabad pilot project at the Turkmen Polytechnic Institute	S
<i>Output 1.2 Pre-feasibility study and draft master plan for improving the heat and hot water supply system for each participating municipality</i>	“State-of-the-art” pre-feasibility studies and draft master plans prepared for each participating municipality	Pre-feasibility studies and Master Plans were prepared for 9 cities	S
Activities: 1.2.1 Developing and implementing a municipal network		Local Project Coordinators (LPCs) were appointed in each city. LPCs discussed project progress and met regularly with the Project Manager in Ashgabat. The network however is not self-sustaining	MS
1.2.2 Analysing the training needs and developing a training program		A memo was prepared by RAMBØLL on 3 June 2004 outlining training needs and an approach to training to be followed	S

Evaluation - Municipal Energy Efficiency Project, Turkmenistan

OUTCOMES & ACTIVITIES	INDICATORS	STATUS	RATING*
<p>1.2.3 Identifying and training the local project co-ordinators (LPCs)</p>		<p>A study tour to Germany and Denmark with 11 participants including 8 LPCs took place from 4 to 19 June 2005.</p> <p>28 specialists from Heating Supply Company of the participating municipalities took place in a 2 week training course from 27 June to 11 July 2005</p> <p>Training for LPC's about modelling heat losses in buildings in 21-22 April 2005.</p> <p>In addition to training of LPC's the following capacity building activities targeting the municipalities: <i>Brochures:</i> Installation of Monitoring Equipment guidelines; Municipal GIS; Monitoring program's activity <i>Training books for specialists:</i> Recommendations on reducing of heat losses; Bacterial corrosion of heat networks; Water preparation in boiler houses in Denmark; Elimination of surplus heat consumption in heat supply for residential buildings; The main sources of heat losses in heat supply systems and methods of their elimination; Ultrasound methods of scale prevention; The GIS in the Heat Supply System (part1 and Part 2) <i>Guidelines:</i> The use of regulations of Communal Heating Supply systems of Turkmenistan; The use of regulations on Heat networks and heat substations of Turkmenistan.</p>	<p>S</p>

Evaluation - Municipal Energy Efficiency Project, Turkmenistan

OUTCOMES & ACTIVITIES	INDICATORS	STATUS	RATING*
1.2.4 Establishing a monitoring system and performing an energy and environmental audit		<p>1) Data from monitoring in boiler houses in 6 municipalities (1 boiler house in Ashgabat; 3 in Mary; 2 in Bayramaly; 2 in Turkmenbashi; 2 in Dashoguz; and 3 in Turkmenabad) collected and a report prepared for each for the 2004–2005 heating season (without monitoring equipment installed in the boiler houses).</p> <p>2) Data from monitoring in boiler houses in 9 municipalities collected and a report prepared for each for the 2005–2006 heating season.</p> <p>3) Post-project the project manager is carrying out analysis of the 2006–7 heating season.</p>	S
1.2.5 Undertaking a social survey		A comprehensive survey covering 7281 apartments was carried out between July and September 2005 (testing of questions took place from 1–8 July in Baýramaly, a seminar held on 11 July). A seminar held on 16 September 2005 in which the results of the survey were discussed.	HS
1.2.6 Defining the options and conducting a pre-feasibility study		Pre-feasibility studies were carried out during 2005. LPCs collected information which was verified and analyzed by the International Consultants	S
1.2.7 Preparing a draft master plan		Draft master plans were prepared and discussed with municipal representatives during 2005 and early 2006	S
<i>Output 1.3: Adoption of the master plan</i>	Master plans adopted	Municipalities endorsed the Master Plans prepared in the project, but do not have the power or financial resources to adopt them.	<i>MS</i>
<p>Activities</p> <p>1.3.1 Organising seminars and workshops to present and discuss the results of the work</p>		A seminar was held on 16 September 2005 with 19 participants including LPCs and municipal representatives from 5 cities in which results of the project work was presented.	MS
Immediate Objective 2 To establish supportive institutional and financial framework for implementing the identified opportunities in each participating municipality	Investment proposals for improving the energy efficiency of the heat and hot water supply being financed and implemented in each participating municipality	No investment proposals were financed during the project	U

Evaluation - Municipal Energy Efficiency Project, Turkmenistan

OUTCOMES & ACTIVITIES	INDICATORS	STATUS	RATING*
<i>Output 2.1 Draft concept for consumption based billing and for revised tariff structure</i>	Draft concept for a consumption based billing system and for a revised tariff structure being prepared	A conceptual document was prepared	S
Activities 2.1.1 Developing a draft concept for consumption based billing and revised tariff structure.		A conceptual document was prepared as a 'methodology of tariffs' and these were discussed with the LPCs. It was agreed between the Project Manager and National Project Co-ordinator that no further progress could be made on this topic	S
2.1.2 Reviewing the existing legal, regulatory and institutional framework.		The conceptual report included a brief analysis of these issues.	U
<i>Output 2.2 A guidebook on project preparation and financing and recommendations for legal and regulatory changes to support the investments</i>	A guidebook on project preparation and financing published	The guidebook was prepared and distributed to participating municipalities in Russian and Turkmen.	S
Activities: 2.2.1 Compiling and reviewing internationally available material on project financing		Carried out by international consultants and included in the guidebook	S
2.2.2 Identifying financing sources and clarifying their financing conditions		Carried out by international consultants and included in the guidebook	MS
2.2.3 Identifying all the existing barriers to financing projects in heat and hot water supply sector in Turkmenistan and making recommendations for their removal (THIS IS ACTIVITY 2.2.6 IN THE RUSSIAN VERSION OF THE PROJECT DOCUMENT)		Carried out by international consultants and included in the guidebook	MS
2.2.4 Finalising the guidebook (THIS IS ACTIVITY 2.2.3 IN THE RUSSIAN VERSION OF THE PROJECT DOCUMENT)		Carried out by international consultants, translated into Russian and Turkmen	MS

Evaluation - Municipal Energy Efficiency Project, Turkmenistan

OUTCOMES & ACTIVITIES	INDICATORS	STATUS	RATING*
2.2.5 Promoting awareness on business opportunities in Turkmenistan (THIS IS ACTIVITY 2.2.4 IN THE RUSSIAN VERSION OF THE PROJECT DOCUMENT)		Not implemented	U
2.2.5 Help support municipalities to organize funding for investments (RUSSIAN VERSION OF THE PROJECT DOCUMENT ONLY)		A request to UNDP was made to support training on financing for the municipalities, but this was not approved	U
<i>Output 2.3 National Heat Strategy</i>	A national heat strategy adopted by the Government of Turkmenistan	The National Strategy was submitted to Government but not adopted yet.	MS
Activities: 2.3.1 Preparing a draft concept for a national strategy		A draft concept of the National Strategy was developed by the international consultants, and improved by review of 5 local experts.	S
2.3.2 Organizing a workshop to present, evaluate and discuss the results		The National Strategy was sent by UNDP to the Ministry of Foreign Affairs. To the best knowledge of project staff it has not yet been forwarded to the Ministry of Energy or Turkmengas. No workshops were held.	U
2.3.3 As applicable, facilitating otherwise the process of adopting the heat strategy by the Government		No additional activities were carried out	U
<i>Added during project implementation</i>			
Selection of GIS specialist Purchase of computer equipment for GIS Training of the LPC on GIS programs and creation of GIS in the Heat Supply System.		GIS systems were set up in 7 of the 9 municipalities (the exceptions being Hazar and Kuhne Urgench). A GIS specialist was hired, based in Ashgabad. Training was given to LPCs, and data of heating networks captured in GIS systems in each municipality. Local use of the system was inconsistent but very highly appreciated and used on a daily basis in some municipalities.	S

* The ratings used are: HS – Highly Satisfactory, S – Satisfactory, MS – Marginally Satisfactory, and US – Unsatisfactory.

Evaluation - Municipal Energy Efficiency Project, Turkmenistan

Sustainability and replicability

68. **Financial resources:** Without the adoption of a national heating strategy (Output 2.3) financial resources will not be available such that the project outcomes/benefits will be sustained once the GEF assistance ends. The project was not successful in identifying and leveraging co-financing following the end of the project. The Master Plans could provide the basis for accessing carbon finance, provided other barriers can be overcome and the needs for capital costs addressed, which could contribute to overall project sustainability.

69. **Socio-political:** A number of project stakeholders, in particular the Project Manager has a high level of interest in continuing working in the sector. Given the need to address public sector investment there is a high likelihood that the project outcomes/benefits will eventually be achieved, and the project has provided a number of resources which are likely to be used to form government policy. Given the current impasse between the UNDP and the Ministry of Foreign Affairs, and the lack of access and experience of the UNDP to relevant stakeholders in the gas / heating sector, it is uncertain whether there is sufficient stakeholder awareness in support of the long term objectives of the project.

70. **Institutional framework and governance:** The GIS system development and the availability of monitoring equipment for the use of the participating municipalities are likely to be used after the end of the project although the interest in these two technical achievements is not equal in all cities (the GIS system is actively used by the municipality in Mary, but not in Bayramaly, for example).

The project's recommendations to national and local authorities as embodied in the conceptual document on a 'methodology of tariffs', analysis of legal regulatory and institutional framework, master plans, financing guide, and the national strategy are highly relevant but, in the absence of the adoption of the national strategy the applicability is very limited.

71. **Replication:** There is currently no evidence of replication and catalytic outcomes, or scaling up that suggests increased likelihood of sustainability.

72. **Sustainability:** The GIS system development and supply of monitoring equipment in the participating municipalities may bring about ongoing benefits. The training guides, and strategic analyses carried out under the project are likely to continue to be used after the end of the project, but only once a national heating strategy is adopted. Apart from the drafting of the national strategy, no explicit activities, such as the institutionalizing of capacity building activities, were implemented to ensure ongoing sustainability of the project benefits. The project manager is now lecturing at the Polytechnic University in the Heat, Gas & Water Supply Department, and giving lectures on the

Evaluation - Municipal Energy Efficiency Project, Turkmenistan

related topics. UNDP intends to continue with the efforts to resubmit the Draft National Strategy, and is working to engage with Turkmengas. Other UNDP efforts include the proposed development of incentives for saving energy and building codes.

73. Following the recent merging of the Research Institute of Municipal Economy, Methodology and Development into the Research Institute on Design and Construction for communal services of the Ministry of Construction, institutional sustainability is severely under threat.

III. Recommendations

74. Ongoing efforts in the heating sector will be needed capitalize on the achievements of the project. There is a real danger that the advances achieved in the project will be lost without follow-up activities. A least-cost option might be to work with the Polytechnic University to develop further the training materials and offer courses to students and possibly other stakeholders. A training institute established within the University – possibly with a broader remit such as “Capacity building for Municipal Services and Management” could make cost effective use of the resources developed under the project. If possible this activity should be included in follow-up UNDP activities.
75. UNDP should make every effort to ensure that the Ministry of Foreign Affairs passes on the national strategy to relevant stakeholders. Ongoing efforts to get the draft national strategy into the hands of people within the gas sector are strongly recommended.
76. For future activities addressing the heating and hot water sector, stakeholders from the Ministry of Gas, state concerns like Turkmengas, and the Ministry of Finance should, if possible, be involved, since they have both the resources and the incentive to improve energy efficiency in this sector.

IV. Lessons Learned

77. The difficulties in identifying local stakeholders during project execution underline the importance of carrying out a thorough institutional review during project design.
78. Whether projects are logically designed or not, project managers should produce and maintain a logical framework with logical structure aimed at delivering project objectives, objectively verifiable indicators which can track delivery of activities and outputs, and risks/assumptions. These are essential management tools. Project management approach used should focus on both day-to-day activities, as well as bigger picture.
79. Project teams should be creative and flexible, and the UNDP should make efforts to ensure that conceptual ideas given in the project brief / document are truly relevant at the time of implementation.
80. Building institutional capacity as well as technical capacity is crucially important for ongoing sustainability. However in a development context where institutions may be changed at any time such as in Turkmenistan, it is essential to engage with as many stakeholders as possible so that there is sufficient awareness throughout the sector. The right institutional arrangements are a key to ensuring that project activities will continue after the end of the project. Administrative barriers (approvals from government and municipalities, tender processes, procurement etc.) take significantly longer to address in new markets than usually expected.
81. Policy development work requires prior and ongoing government willingness to address policy issues: where government are keen to develop policies on a particular subject, the project can effectively assist, but where this willingness does not exist, significant ground work may be needed to lay the foundations for future policy development.
82. Where governments are not already intending to develop policies and legislation, projects cannot guarantee to produce results. The timing of policy and legislation development cannot be programmed into a project workplan.
83. Sufficient resources should be allocated to monitoring and analysing project impacts. This will assist daily management. Baseline monitoring is also essential for the determination of impacts.
84. Efforts should be taken to ensure local ownership in every project activity. International consultants should be in a support not a lead role. If local capacity does not exist to lead activities, this capacity should be built as a matter of urgency.

Annex 1: Evaluation terms of reference

Terms of Reference for Final Evaluation of the UNDP/GEF project on Improving Energy efficiency in the heat and hot water supply system in Turkmenistan

Duration: 14 days

Evaluation Site: Ashgabat, Turkmenistan and 2-3 day field visit

I. INTRODUCTION

UNDP/GEF Monitoring and Evaluation (M&E) policy

The Monitoring and Evaluation (M&E) policy at the project level in UNDP/GEF has four objectives: i) to monitor and evaluate results and impacts; ii) to provide a basis for decision making on necessary amendments and improvements; iii) to promote accountability for resource use; and iii) to document, provide feedback on, and disseminate lessons learned. A mix of tools is used to ensure effective project M&E. These might be applied continuously throughout the lifetime of the project – e.g. periodic monitoring of indicators -, or as specific time-bound exercises such as mid-term reviews, audit reports and final evaluations.

In accordance with UNDP/GEF M&E policies and procedures, all regular and medium-sized projects supported by the GEF should undergo a final evaluation upon completion of implementation. A final evaluation of a GEF-funded project (or previous phase) is required before a concept proposal for additional funding (or subsequent phases of the same project) can be considered for inclusion in a GEF work program. However, a final evaluation is not an appraisal of the follow-up phase.

Final evaluations are intended to assess the relevance, performance and success of the project. It looks at early signs of potential impact and sustainability of results, including the contribution to capacity development and the achievement of global environmental goals. It will also identify/document lessons learned and make recommendations that might improve design and implementation of other UNDP/GEF projects.

Objectives of the Project

The Project is to remove the existing barriers to the improvement of the heat and hot water supply systems in Turkmenistan, thereby reducing their energy consumption and the associated greenhouse gas emissions. This project operates in 9 participating cities: Ashgabat, Balkanabad, Bayramaly,

Evaluation - Municipal Energy Efficiency Project, Turkmenistan

Dashoguz, Khazar, Kohne Urgench, Mary, Turkmenbashy and Turkmenabad. With support from international and local experts, the activities are designed to be implemented in a very transparent and technically sound manner. Project's success will be turned into the case of studies that can be used to replicate the project elsewhere. The calculation of the real consumption of heat, gas and feed water in the selected boiler houses and dwelling houses using the installed metering equipment (heat meters, gas meters & etc.) allows calculating heat losses and water losses in the heat networks. This leads to the reducing consumption of gaseous fuels. The procured gas analyzer helps to determine the temperature of the exhaust flue gas; quantity of CO₂; air surplus factor; O₂ concentration; carbon monoxide; specific value of CO; air temperature before burner; boiler house efficiency and importance of traction in boiler house.

II. OBJECTIVES OF THE EVALUATION

This Final Evaluation is initiated by UNDP Turkmenistan in line with the UNDP/GEF requirements for evaluations. The Evaluation is conducted to provide an independent, comprehensive and objective assessment of project implementation, outputs and outcomes in full accordance with the GEF Guidelines on the Conduct of Final Evaluations and shall cover the following:

1. Implementation approach: analysis of the project's logical framework, adaptation to changing conditions (adaptive management), partnerships in implementation arrangements, changes in project design, and overall project management
2. Country ownership/Driveness: relevance of the project to national development and environmental agendas, recipient country commitment, and regional and international agreements where applicable.
3. Stakeholder participation: information dissemination, consultation, and "stakeholder" participation.
4. Sustainability: continuation of the benefits, within or outside the project domain, from a particular project or program after GEF assistance/external assistance has come to an end.
5. Replication approach: lessons and experiences coming out of the project that are replicated or scaled up in the design and implementation of other projects.
6. Financial planning. actual project cost by activity, financial management (including disbursement issues), and co-financing
7. Cost-effectiveness: achievement of the environmental and developmental objectives as well as the project's outputs in relation to the inputs, costs, and implementing time
8. Monitoring and evaluation: periodic oversight of a process, or the implementation of an activity, which seeks to establish the extent to which inputs, work schedules, other required actions and outputs are proceeding according to plan

Evaluation - Municipal Energy Efficiency Project, Turkmenistan

The main stakeholders of the evaluation are the Research Institute for Municipal Infrastructure Development under the Cabinet of Ministers of Turkmenistan, the nine participating municipalities, and heat and hot water consumers in those municipalities.

The purpose of this evaluation is to assess the specific contributions, efficiency, effectiveness, relevance and sustainability of interventions, as well as strategic positioning and partnerships applied, practiced and achieved within this project.

III. PRODUCTS EXPECTED FROM THE EVALUATION

The main product expected as result of this final evaluation is an evaluation report that shall contain information on all the aforementioned components and be structured in the following format:

1. Executive summary (2-3 pages)
2. Introduction (max 2 pages)
3. The project(s) and its development context (2-3 pages)
4. Findings and Conclusions
 - 4.1 Project formulation (2 pages)
 - 4.2 Implementation (4-5 pages)
 - 4.3 Results (4-5 pages)
5. Recommendations (3-4 pages)
6. Lessons learned (2-3 pages)
7. Annexes (content and number to be determined)

The first draft of the evaluation report should be submitted to UNDP Country Office in Turkmenistan within three weeks after the evaluation mission has been completed. UNDP Country Office in Turkmenistan will provide assistance in translating and circulating the first draft of the evaluation report to all the stakeholders involved in the evaluation process. Should there be discrepancies between the impressions and findings of the evaluation team and the aforementioned parties, these should be explained in an annex attached to the final report.

IV. METHODOLOGY OR EVALUATION APPROACH

The evaluation shall be based on the following methodology:

Evaluation - Municipal Energy Efficiency Project, Turkmenistan

- Documentation review (desk study); the list of documentation to be reviewed is included as an Annex to the TORs
- Interviews/meetings
- Field visits (only one 2-3 day field visit is suggested during the mission; field visit site to be determined)
- Questionnaires (this is optional, and this methodology should be further discussed in terms of format, content and focus group).
- Participatory techniques and other approaches for the gathering and analysis of data (this methodology is optional and may include various meetings)

EVALUATION TEAM

The evaluation shall be conducted by one evaluation consultant. The evaluator is responsible for delivering the aforementioned tasks and shall have substantial experience and technical knowledge in relation to evaluations of GEF-funded projects and programmes. The evaluation consultant is responsible for finalizing the evaluation report. The evaluation consultant can be internal or external, national or international.

VI. IMPLEMENTATION ARRANGEMENTS

- Management arrangements – UNDP Country Office in Turkmenistan is the main operational point for the evaluation. It will be responsible for or co-ordinate liaising with the project team to set up the stakeholder interviews, arrange the field visits, co-ordinate with the Government the hiring of national consultants and ensure the timely provision of per diems and travel arrangements within the country for the evaluator.
- Time frame:
 - Desk review (7 days)
 - Briefings for evaluator. (1 day)
 - Visits to the field (including allocation for travel), interviews, questionnaires (3-5 days)
 - Debriefings (1 day)
 - Validation of preliminary findings with stakeholders through circulation of initial reports for comments, meetings, and other types of feedback mechanisms (3 days)
 - Submission of first draft evaluation report (3 weeks after the mission)
 - Submission of final evaluation report (1 week after comments are received and finalized on first draft)

VII. SCOPE OF THE EVALUATION- SPECIFIC ISSUES TO BE ADDRESSED.

1. Executive summary

- Brief description of project
- Context and purpose of the evaluation
- Main conclusions, recommendations and lessons learned

2. Introduction

- Purpose of the evaluation
- Key issues addressed
- Methodology of the evaluation
- Structure of the evaluation

3. The project and its development context

- Project start and its duration
- Problems that the project seek to address
- Immediate and development objectives of the project
- Main stakeholders
- Results expected

4. Findings and Conclusions

In addition to a descriptive assessment, all criteria marked with (R) should be rated using the following divisions: Highly Satisfactory, Satisfactory, Marginally Satisfactory, Unsatisfactory

4.1. Project Formulation

Conceptualisation/Design (R). This should assess the approach used in design and an appreciation of the appropriateness of problem conceptualization and whether the selected intervention strategy addressed the root causes and principal threats in the project area. It should also include an assessment of the logical framework and whether the different project components and activities proposed to achieve the objective were appropriate, viable and responded to contextual institutional, legal and regulatory settings of the project. It should also assess the indicators defined for guiding implementation and measurement of achievement and whether lessons from other relevant projects (e.g., same focal area) were incorporated into project design.

Evaluation - Municipal Energy Efficiency Project, Turkmenistan

Country-ownership/Drivenness. Assess the extent to which the project idea/conceptualization had its origin within national, sectoral and development plans and focuses on national environment and development interests.

Stakeholder participation (R) Assess information dissemination, consultation, and “stakeholder” participation in design stages.

Replication approach. Determine the ways in which lessons and experiences coming out of the project were/are to be replicated or scaled up in the design and implementation of other projects (this also related to actual practices undertaken during implementation).

Other aspects to assess in the review of Project formulation approaches would be UNDP comparative advantage as IA for this project; the consideration of linkages between projects and other interventions within the sector and the definition of clear and appropriate management arrangements at the design stage.

4.2. Project Implementation

Implementation Approach (R). This should include assessments of the following aspects:

1. The use of the logical framework as a management tool during implementation and any changes made to this as a response to changing conditions and/or feedback from M and E activities if required.
2. Other elements that indicate adaptive management such as comprehensive and realistic work plans routinely developed that reflect adaptive management and/or; changes in management arrangements to enhance implementation.
3. The project's use/establishment of electronic information technologies to support implementation, participation and monitoring, as well as other project activities.
4. The general operational relationships between the institutions involved and others and how these relationships have contributed to effective implementation and achievement of project objectives.
5. Technical capacities associated with the project and their role in project development, management and achievements.

Monitoring and evaluation (R). Including an assessment as to whether there has been adequate periodic oversight of activities during implementation to establish the extent to which inputs, work schedules, other required actions and outputs are proceeding according to plan; whether formal evaluations have

Evaluation - Municipal Energy Efficiency Project, Turkmenistan

been held and whether action has been taken on the results of this monitoring oversight and evaluation reports.

Stakeholder participation (R). This should include assessments of the mechanisms for information dissemination in project implementation and the extent of stakeholder participation in management, emphasizing the following:

- (i) The production and dissemination of information generated by the project.
- (ii) Local resource users and NGOs participation in project implementation and decision making and an analysis of the strengths and weaknesses of the approach adopted by the project in this arena.
 - (iii) The establishment of partnerships and collaborative relationships developed by the project with local, national and international entities and the effects they have had on project implementation.
- (iv) Involvement of governmental institutions in project implementation, the extent of governmental support of the project.

Financial Planning: Including an assessment of:

- (i) The actual project cost by objectives, outputs, activities
- (ii) The cost-effectiveness of achievements
- (iii) Financial management (including disbursement issues)⁸
- (iv) Co-financing ⁹

Sustainability. Extent to which the benefits of the project will continue, within or outside the project domain, after it has come to an end. Relevant factors include for example: development of a sustainability strategy, establishment of financial and economic instruments and mechanisms, mainstreaming project objectives into the economy or community production activities.

⁸ Please include a summary of financial disbursements by the project, against planned expenditures.

⁹ Please see guidelines at the end of Annex 1 of these TORs for reporting of co-financing

Evaluation - Municipal Energy Efficiency Project, Turkmenistan

Execution and implementation modalities. This should consider the effectiveness of the UNDP counterpart and Project Co-ordination Unit participation in selection, recruitment, assignment of experts, consultants and national counterpart staff members and in the definition of tasks and responsibilities; quantity, quality and timeliness of inputs for the project with respect to execution responsibilities, enactment of necessary legislation and budgetary provisions and extent to which these may have affected implementation and sustainability of the Project; quality and timeliness of inputs by UNDP and GoC and other parties responsible for providing inputs to the project, and the extent to which this may have affected the smooth implementation of the project.

4.3. Results

Attainment of Outcomes/ Achievement of objectives (R): Including a description *and rating* of the extent to which the project's objectives (environmental and developmental) were achieved using Highly Satisfactory, Satisfactory, Marginally Satisfactory, and Unsatisfactory ratings. If the project did not establish a baseline (initial conditions), the evaluators should seek to determine it through the use of special methodologies so that achievements, results and impacts can be properly established.

This section should also include reviews of the following:

Sustainability: Including an appreciation of the extent to which benefits continue, within or outside the project domain after GEF assistance/external assistance in this phase has come to an end.

Contribution to upgrading skills of the national staff

5. Recommendations

Corrective actions for the design, implementation, monitoring and evaluation of the project

Actions to follow up or reinforce initial benefits from the project

Proposals for future directions underlining main objectives

6. Lessons learned

This should highlight the best and worst practices in addressing issues relating to relevance, performance and success.

7. Evaluation report Annexes

Evaluation TORs

Itinerary

List of persons interviewed

Evaluation - Municipal Energy Efficiency Project, Turkmenistan

Summary of field visits

List of documents reviewed

Questionnaire used and summary of results

Comments by stakeholders (only in case of discrepancies with evaluation findings and conclusions)

VIII. TERMS OF REFERENCE ANNEXES

Annex 1: Terminology in the GEF Guidelines to Final Evaluations

Annex 2: List of Documents to be reviewed by the evaluators

Annex 2: Itinerary and list of people interviewed

Monday 16 July

- Inception meeting at UNDP with Rovshen Nurmuhamedov and Djemshid Khadjiyev and Project Manager Arslan Zomov
- Meeting at Research Institute with Kurban Akiyev, Chief of Team, Department of Communal Services

Tuesday 17 July

- Discussions with Project Manager Arslan Zomov
- LPC Ashgabad, Mr Sapaev

Wednesday 18 July

- Mary city:
 1. Meredov Murat- Chief of the Industrial, Construction, Communal Services and Communication Department of Mary city.
 2. Mavyev Mukhammet- Chief of the Heating Supply Company of Mary city.
 3. Karakozov Akmurat- Chief engineer of the Heating Supply Company of Mary city.
 4. Khodjaev Muradaly- LPC of the Mary city.

Thursday 19 July

- Bayramaly city:
 1. Karlyeva Jennet – Deputy of Khakim Bayramaly city.
 2. Babaev Oraz- LPC of Bayramaly city.
 3. Meredov Allaberdi- Chief of the Heating Supply Company of Baramaly city.

Friday 20 July

- Ms. Inita Paulovica, UNDP Deputy Resident Representative

Saturday 21 July

- Discussions with Project Manager Arslan Zomov

Sunday 22 July

- Discussions with National Project Coordinator, Mr K.B Saporov

Annex 3: List of main documentation reviewed

Project Document

Project Brief

Project and Budget Revisions

Annual Workplans

Quarterly Progress Reports

Project Implementation Reviews

Project related reports, minutes, correspondence and other files

Policy documents of the project such as draft heating strategy, finance guidebook, master-plans