

FINAL EVALUATION REPORT

of the

UNDP/GEF Full Size Project

Armenia

Improving the Energy Efficiency of Municipal Heating and Hot Water Supply

Atlas Project ID: 00035799

PIMS: 1273

This Final Evaluation Report was prepared for UNDP Armenia by:

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Abbreviations and acronyms

APR	Annual Project Review
AWP	Annual Work Plan
CHP	Combined Heat and Power (equivalent to co-generation)
DH	District Heating
EE	Energy Efficiency
FIT	Feed-In-Tariff
GEF	Global Environment Facility
LPAC	Local Program Appraisal Committee
MENR	Ministry of Energy and natural Resources, Republic of Armenia
PDF	Project Development Facility
PIMS	Project Information Management System (UNDP GEF)
PIR	Project Implementation Review
PIU	Project Implementation Unit
PSRC	Public Services Regulatory Commission of the Republic of Armenia
RA	Republic of Armenia
R2E2	Armenian Renewable Resources and Energy Efficiency Fund
ToR	Terms of Reference
UNDP	United Nations Development Programme
US AID	United States Agency for International Development
WB	World Bank

1. Executive summary

GEF Project ID:	1273
GEF Agency Project ID:	00035799
Country:	Republic of Armenia
Project Title:	Armenia - Improving the Energy Efficiency of Municipal Heating and Hot Water Supply
GEF Agency:	UNDP
Other Executing Partner:	Ministry of Nature Protection of the Republic of Armenia – executing agency

The Project development started by GEF pipeline entry on 1 July 1998 and PDF-B approval on 28 July 1998. PDF-B phase was finalized in 2002. The Project was accepted in the GEF Work Program in 2003, and the Project Document was endorsed by GEF CEO on 5 April 2004. The Project document was signed by the Government and UNDP on 21 January 2005.

The whole project preparation phase including development and approval of the project document lasted six and half years (7/2008-1/2005). The four-year project was originally planned to be closed on 20 January 2009.

During the project implementation phase the project has been extended twice, and is scheduled to be completed in October 2012. Total duration of project implementation is seven years and nine months (eight years till project closing).

Table 1: Project Timeframe

	Expected date	Actual date
CEO endorsement/approval		5 April 2004
Agency approval date		21 January 2005
Implementation start		21 January 2005
Midterm evaluation completion		17 September, 2008
Project completion	October 2012	
Terminal evaluation completion		July 2012
Project closing	February 2013	

The total budget of the project is 2.95 mil USD provided by GEF as a grant for project implementation. GEF has provided additional 0.21 mil USD grant for project preparation - PDF B. The government of Armenia has provided 0.2 mil USD of in-kind contribution.

Project co-financing has been estimated to include 10 mil USD of the World Bank IDA credit, 1 mil USD World Bank Project Preparation Facility, US AID 7.77 mil USD under the “Program for Improved Energy Management to Enhance Energy Security in Armenia”, Dutch funded “Armmedheat – Development of the District Heating Industry in Armenia”, and Japanese grant of 0.5 mil USD for the project “Armenia Utility Restructuring Project Grant”.

The total project budget has been estimated in the Project Document to be 12.025 mil USD.

1.1 Brief description of project

After the breakup of the Soviet Union and the conflict in Nagorno Karabakh, Armenia has experienced a significant economic decline (42% decline of GDP in 1992). Energy imports from Azerbaijan (and partly from Russia) were subject of a blockade. As a result district heating that supplied most of multiapartment residential buildings collapsed and natural gas was banned for several years to be used in residential sector. Heating of residential dwellings became a critical problem. Those who could afford to pay electricity bills used electrical heating, others used firewood in provisional stoves even in multiapartment buildings or did not use heating at all, although winters in most parts of Armenia are cold and long. In late 1990s/beginning of 2000s natural gas became available also in residential areas and flat owners in multiapartment buildings started to install apartment level natural gas heaters and boilers. This led to further disintegration of those few old and inefficient district heating schemes that were still in operation.

As a response to this situation UNDP Armenia has initiated in 1998 the project “Improving the Energy Efficiency of Municipal Heating and Hot Water Supply”.

The objective of the project is *to reduce greenhouse gas (GHG) emissions resulting from the current heat and hot water supply practices in Armenian cities by laying the foundation for the sustainable development of heat and hot water supply services in these cities while taking into account global environmental impacts.*

Within this framework, the project was designed to:

- (i) strengthen the role of condominiums in collectively organizing and managing heat and hot water supply services at the building level;
- (ii) support the restructuring and capacity building of the existing district companies to improve both their service quality and operational efficiency;
- (iii) support the new decentralized service providers to commercially run, market and diversify their businesses, in order to promote the use of alternative environmentally clean and energy efficient technologies and to structure financing for the required investments in areas that do not sustain the centralized district heating services; and,
- (iv) utilize the results, experiences and lessons learned for advancing the sustainable development of the heat and hot water services in Armenia with a specific emphasis on the GHG emission reduction aspects.

The proposed capacity building and other technical assistance activities were designed to complement and be implemented in close co-operation with the activities of the other donors including the World Bank/IDA funded Urban Heating Project, the Government of Netherlands funded Industrial District Heating Development project and the envisaged USAID funded activities in the field of energy and environment.

1.2 Context and purpose of the evaluation

This Final Evaluation has been performed on a request of UNDP Armenia as a part of a standard project monitoring and evaluation procedure.

The Final Evaluation including on-site mission has been performed in July 2012.

1.3 Main conclusions, recommendations and lessons learned

The project focused on developing regulatory framework for financially viable implementation of municipal heating solutions, demonstration of commercially feasible solutions with private investors, and near-to-commercial solutions (solar heat collectors), and on dissemination of results.

The project has succeeded to successfully demonstrate privately financed reconstruction and operation of district heating with cogeneration unit and supply of heat for space heating and hot water billed on actual consumption to 300 apartments and a kindergarten in the Avan district of Yerevan. The first phase of the project in operation is expected to be extended. Financial viability of the project is guaranteed by a special agreement with the government providing preferential feed-in-tariffs for the project.

A total of 24 pilot projects, including cogeneration district heating, heat-only district heating, solar panel installation, and energy efficiency technologies, have been implemented. 21 implemented pilot projects are in operation. Three of the pilots have been terminated. This illustrates the difficult situation in restoration of district heating system in current conditions in Armenia.

One of the terminated projects was based on cogeneration and was suspended after the Public Services Regulatory Commission (PSRC) has cancelled its preferential feed-in tariff (FIT) regulation. Without preferential FITs cogeneration projects in current Armenian conditions (energy price level) cannot generate sufficient revenues to pay back for the investment.

Two other terminated projects were small scale district heating projects based on heat only boilers. Residential customers considered costs of heating services to be too high and they continued disconnecting from the district heating and instead of it they have installed individual apartment level natural gas heating.

Four other pilot small-scale district heating systems are in operation and have demonstrated effective operation and heat billing based on individually metered consumption on an apartment level.

The project demonstrated also simple energy efficiency measures on a building level: installation of missing entrance doors and replacement of broken windows in a building staircase. The fact that building owners, neither condominiums nor apartment owners, have been able at least to replace broken glazing in windows on building stairways illustrates the complexity of problems related to building level solutions.

On the other hand, in case there were motivated individuals – apartment owners, condominium and municipality representatives, projects have been successfully implemented.

The UNDP/GEF project has demonstrated also near-to commercial feasibility of installation of solar heat collectors that can replace natural gas usage for hot water preparation and partially for space heating as well.

Some of the demonstrated technologies (infrared heating) can be commercially attractive in specific applications already with current energy prices in Armenia – and have been commercially replicated in several installations after having been demonstrated in the pilot project.

The critical factor for building level and district heating solutions in residential sector is the economic competitiveness and affordability for (low-income) households.

Under current conditions newly re/constructed heat-only district heating schemes based on natural gas are hardly competitive with individual apartment level gas heating solutions – both in economic terms, but also in GHG emissions. (Cost-effectiveness of a project is always site specific because it depends on a number of site specific parameters – status of old/existing DH infrastructure, share of apartment owners willing to switch from individual heating to centralized heating etc.)

Co-generation and solar heat panels installed in district heating have a potential to reduce GHG emissions. In addition to that district heating solutions also eliminate safety risks of individual gas heating in case the safety regulations are not observed. However, with current energy prices these technologies are not yet feasible and require governmental support – in a form of a subsidy or preferential feed-in-tariffs.

Although the project has estimated the total potential for electricity cogeneration in residential and public sectors to be 100 MW_{el} (i.e. relatively low), the regulator (PSRC) has cancelled in 2010 preferential FITs regulation introduced in 2006. Under a special agreement it is only the pilot project in Avan that has special FITs in place. The PSRC is expected to wait until full completion of the Avan project before further decision.

The governmental support for cogeneration (FITs) is critical for its commercial replication and sustainability of reconstructed district heating schemes based on cogeneration.

Activities to strengthen condominiums have been minimized based on recommendation of the MTE and because condominiums cannot be financially credible clients for heat suppliers as long as the share of low-income households is significant and no sufficient state-support schemes for low-income households are in place. Instead of condominiums heat suppliers decided to conclude heat service contracts directly with apartment owners. Condominiums played a critical role in information dissemination and awareness and interest raising activities among apartment owners in multiapartment buildings.

The project has delivered 11 prefeasibility studies and 8 feasibility studies, drafted regulations supporting implementation of effective municipal district heating projects, and developed analytical reports, information materials for professional audience, as well as for energy end-users. The key piece of the developed regulations is the methodology for FIT of cogenerated electricity that was adopted by PSRC but cancelled in 2010.

The rating of individual project evaluation criteria is summarized in Table 2.

Table 2: Summary Rating of the Project Implementation

Project Formulation	Rating
Project relevance and implementation approach	Highly Satisfactory
Logical Framework	Moderately Unsatisfactory
Country ownership/drivenness	Highly Satisfactory
Stakeholder participation in the design phase	Highly Satisfactory
Replication approach and sustainability strategy	Satisfactory
Cost-effectiveness	Highly Satisfactory
UNDP comparative advantage	Satisfactory
Linkages with other interventions	Satisfactory
Management arrangements	Satisfactory
Project Implementation	
Implementation approach	Satisfactory
LogFrame used during implementation	Satisfactory
Effective partnerships arrangements	Satisfactory
Feedback from M&E used for adaptive management	Satisfactory
Financial planning and management	Satisfactory
Monitoring and Evaluation	Satisfactory

Management by the UNDP office	Moderately Satisfactory
Project Results	
Attainment of objectives	Satisfactory
Cost-effectiveness of pilot projects	Highly Satisfactory
Project impact	Moderately Unsatisfactory
Prospects of sustainability	Moderately Unlikely
Contribution to upgrading national skills	Satisfactory

The project impact, replication potential and prospects of sustainability critically depends on governmental support for cogeneration - preferential feed-in-tariff regulation. Currently such support is in place only for the Avan and Davitashen district heating projects based on co-generation. The decision to restore FIT regulation by PSRC has been postponed until completion of these projects. The future replication potential of similar projects is thus currently unclear.

The actual project implementation and results delivered by the project team is rated *Satisfactory*.

Highly Satisfactory	Satisfactory	Moderately Satisfactory	Moderately Unsatisfactory	Unsatisfactory	Highly Unsatisfactory
	S				

Summary of key recommendations:

- Project logframe indicators and targets should be specified for all project outcomes and at least for all critical project outputs.
- If properly defined project indicators and targets should not be changed over the project implementation period unless the project objectives or outputs are changed.
- Project logframe indicators and targets can and should be supplemented with more detailed indicators and targets for each of the project activity. These detailed activity indicators and targets are then subject to quarterly and annual evaluation by the project manager and the project steering committee.

Main lessons learned:

- Condominiums turned out not to be suitable contracting partners for heat suppliers because of large share of low-income households and unoccupied apartments in typical multiapartment buildings. Heat suppliers preferred to conclude heat supply contracts directly with apartment owners. Typically not all apartment owners opted in pilot projects for the centralized heating solutions.
- New restoration of building level and DH systems based on heat only boilers is typically not sufficiently competitive with already existing individual natural gas apartment level solutions.
- Building level and DH schemes based on heat-only boilers do not have significant environmental benefits compared to individual natural gas heating solutions, if they are based on efficient low-emission technology.

- However, in contrast to individual apartment heating solutions, building level and especially DH schemes do have a *technical potential* to accommodate co-generation and solar panels that could reduce emissions.
- In current Armenian conditions investment to renovation of DH and building level schemes with cogeneration is not attractive enough for investors without preferential FITs in place (or other governmental support scheme).
- Without a clear state policy supporting restoration of building level heating solutions and/or district heating (with) co-generation (subsidies, preferential FITs, ...) renovation of building level and district heating solutions is not feasible and replication of successful pilot DH projects will be minimal.
- The pilot project in Avan proved that if the FITs are in place a strong investor can finance and implement affordable and competitive district heating for multiapartment buildings.
- Billing of heating services based on metered actual consumption of individual apartments proved to be a viable solution that reduces the risk of non-payment and motivates end-users to use energy in an efficient way.
- Strong leadership and pro-active project management is critical for successful project implementation. Without strong personality and professional expertise of the Project Manager, as well as of project team experts, the project could not have been implemented successfully.
- The project benefitted also from assistance of international short-term advisors who provided advice both on project management (revision of project logframe matrix) and technical expertise (feasibility study of the Avan pilot project for example).

2. Introduction

2.1 Purpose of the evaluation

This terminal evaluation has been performed on a request of the UNDP Armenia as a standard mandatory requirement of all UNDP projects. The terminal evaluation mission took place in Armenia in July 2012.

The objective of this evaluation is to assess the achievement of project's objective, the affecting factors, the broader project impact and the contribution to the general goal/strategy, and the project partnership strategy. It also provides the basis for learning and accountability for managers and stakeholders and for providing important lessons learned which can be applied to the design of future UNDP projects which aim to remove barriers to energy-efficiency.

According to the GEF and UNDP/GEF Monitoring & Evaluation Policies, the 2009 Handbook on Planning, Monitoring and Evaluating for Development Results, the terminal evaluation has four objectives:

- i. Monitor and evaluate results and impacts;
Analyze and evaluate effectiveness of the results and impacts that the project has been able to achieve against the objectives, targets and indicators stated in the project document;
- ii. Provide a basis for decision making on necessary amendments and improvements;
Assess effectiveness of the work and processes undertaken by the project as well as the performance of all the partners involved in the project implementation;
- iii. Promote accountability for resource use;
Provide feedback and recommendations for subsequent decision making and necessary steps that need to be taken by the national stakeholders in order to ensure sustainability of the project's outcomes/results; and
- iv. Document, provide feedback on, and disseminate lessons learned.
Reflect on effectiveness of the available resource use; and document and provide feedback on lessons learned and best practices generated by the project during its implementation.

2.2 Key issues addressed

The following key issues have been addressed in the final evaluation:

Relevance of the project with national development priorities, and its appropriateness,
Effectiveness of the development project and partnership strategies,
Contribution and worth of the project to national development priorities
Key drivers and success factors enabling successful, sustained and scaled-up development initiatives, alternative options and comparative advantages of UNDP
Efficiency – cost-effectiveness of funds spent to reach project objectives and results
Risk factors and risk management strategies
Sustainability - level of national ownership and measures to enhance national capacity for sustainability of results
Impact of the project implemented on human development

A specific attention has been paid, in addition to the project implementation itself, to the evaluation of recommendations of the mid-term evaluation, to the role of UNDP, and the use of Logical Framework matrix, definition of indicators and targets.

2.3 Methodology of the evaluation

The methodology used for the project final evaluation is based on the UNDP/GEF Monitoring & Evaluation Policies and includes following key parts:

- I. Project documents review prior to the evaluation mission
- II. Evaluation mission and on-site visits, interviews with project management, UNDP, project partners and stakeholders, as well as with independent experts.
- III. Drafting the evaluation report and ad-hoc clarification of collected information/collection of additional information
- IV. Circulation of the draft evaluation report for comments
- V. Finalizing the report, incorporation of comments

2.4 Structure of the evaluation

This final evaluation report follows the structure and content as specified in its Terms of Reference (see Annex 5: Final evaluation TOR) and according to the evaluation template of the 2009 UNDP Handbook on Planning, Monitoring and Evaluating for Development Results, including its 2011 update.

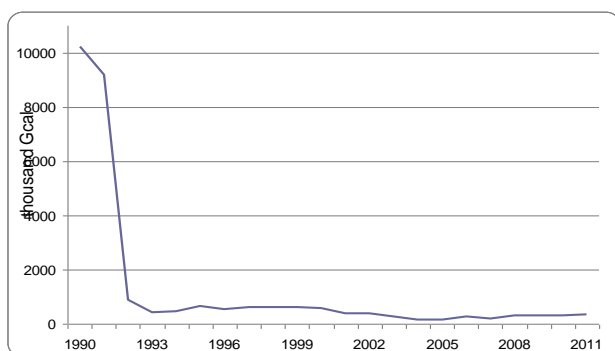
3. The Project and its development context

3.1 Problems that the project seeks to address

In 1992, after Armenian declaration of independence and dissolution of the Soviet Union in 1991, and as a result of Nagorno-Karabakh conflict and following Azerbaijan imposed economic blockade, Armenia has faced severe economic decline (42% drop in GDP, source: Indexmundi.com), including suspension of heavy fuel oil (mazut) and natural gas imports.

Centralized district heating that provided heat for 64% of country's residential space (and more than 90% residential space in multiapartment buildings) collapsed. The scope of the collapse of district heating systems illustrates the Figure 1.

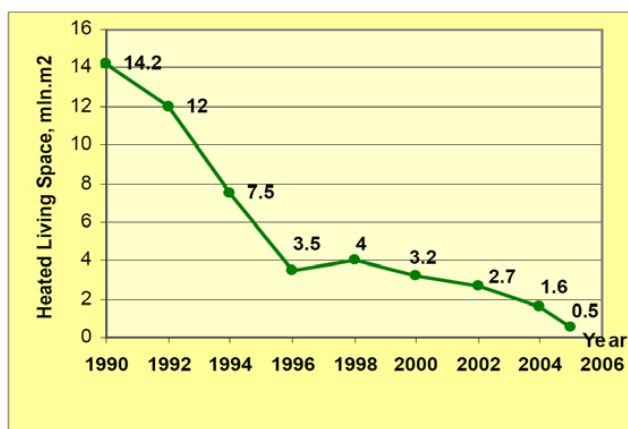
Figure 1: Heat Production in District Heating Plants



Source: Ministry of Energy and Natural Resources, Republic of Armenia for 1992 to 2002 and “ArmRusGasProm” CJSC for 2003 to 2011, quoted in “Lessons Learned from the UNDP-GEF project in Armenia: Improving Energy Efficiency of Municipal Heating and Hot Water Supply”, UNDP/GEF project 00035799, Yerevan, June 2012

The sharp decrease of centrally heated residential apartments in early 1990s has continued in a next decade as well when natural gas supply became widely available also in multiapartment buildings.

Figure 2: Living Area Heated Through Centralized Heating Systems from 1990 to 2005

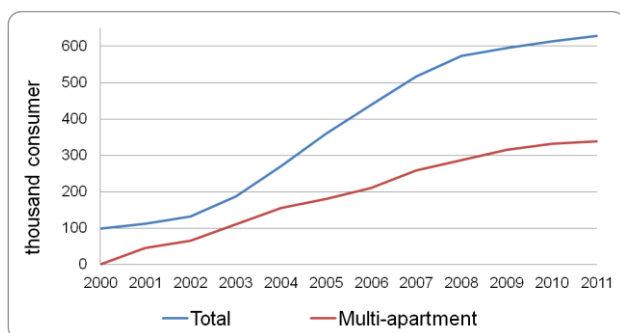


Source: “Armenian Urban Heating Policy Assessment”, Arusyak Ghukasyan and Astghine Pasoyan A., Alliance to Save Energy, Yerevan, 2007 quoted in the MTE Report, Grant Ballard-Tremeer, Eco Ltd., September 2008

The population was forced to seek individual apartment level solutions and has reduced their heating demand and indoor temperature during the heating seasons by installing wood burning stoves, electricity heaters and later on natural gas heaters as well. These individual apartment level solutions led to illegal and unsustainable wood cutting, high costs and higher GHG emissions especially in case of using electricity for space heating.

Since 2000 the natural gas distribution networks have been significantly extended and the number of residential natural gas customers increased more than sixfold. The number of individual apartment level natural gas consumers in multiapartment buildings has increased from zero in 2000 to 350 000 customers in 2012.

Figure 3: Increase of natural gas customers in the housing sector



Source: The Republic of Armenia National Statistical Service, quoted in “Lessons Learned from the UNDP-GEF project in Armenia: Improving Energy Efficiency of Municipal Heating and Hot Water Supply”, UNDP/GEF project 00035799, Yerevan, June 2012

The project seeks to reduce GHG emissions primarily from electricity and unsustainable use of wood for space heating and domestic hot water and to reduce safety risks associated with often poor natural gas installations in apartments and to support restoration, effectiveness and affordability of building level heating solutions and small-scale district heating supply to multiapartment buildings, and to support development of feasible alternatives in neighborhoods where district heating is not available.

3.2 Immediate and development objectives of the project

The development goal of the project has been defined to “*lay the institutional and financial foundation for and to remove other key barriers to the sustainable development of the heat and hot water supply services in Armenia, thereby reducing their GHG emissions and improving their quality and affordability to the customers*”.

Four immediate objectives have been defined in the Project Document:

1. Strengthening the role of the condominiums or other forms of consumer associations in organizing and managing the heat and hot water supply services collectively at the building level.
2. Supporting the restructuring process and building the capacity of the existing DH companies to improve the efficiency of their operations.

3. Supporting the emerging new service providers in offering their services to the condominiums and structuring financing for the investments needed.
4. Utilizing the results, experiences and lessons learnt for advancing the sustainable development of the heat and hot water services in Armenia with a specific emphasis on the GHG reduction aspects

3.3 Project start and its duration

The project development started on 1 July 1998 by the entry into the GEF pipeline and a PDF-B approval on 28 July 1998. PDF-B phase was finalized in 2002, i.e. within four years.

The Project was accepted in the GEF Work Program in 2003, and the Project Document was endorsed by GEF CEO on 5 April 2004. The project approval phase lasted two years.

The Project officially started its implementation phase by the signature of the Project Document by the Government and UNDP on 21 January 2005. The launch of the project has been coordinated with the World Bank/IBDA credit agreement, since the UNDP/GEF project has been agreed upon to provide technical assistance for the WB/IBDA project.

The Project was originally planned to last four years and to be closed on 20 January 2009.

The project implementation phase was extended twice with a final planned project completion in October 2012 and project closing in February 2013. The actual total duration of the project implementation has reached 8 years.

3.4 Main stakeholders

The project executing agency is a Ministry of Nature Protection of the Republic of Armenia.

The implementing agency is UNDP Armenia.

Main project stakeholders identified in the Project Document to be actively involved in project implementation include:

- Ministry of Nature Protection (MNP) as an Executing Agency of the Project
- UNFCCC Focal Point for ensuring the country commitments under the UNFCCC
- Ministry of Finance and Economy as the responsible agency for implementation of Heating Strategy of RA
- Ministry of Energy and Natural Resources (MENR) for promotion of energy conservation and renewable energy development, adoption of standards and certification procedures
- Ministry of Trade and Economic Development in supporting new service providers in the heating sector and promoting local manufacturers

- Ministry of Territorial Administration, Regional Governors' Offices and Yerevan City Municipality for developing and implementing pilot projects
- Ministry of Urban Development for supporting the development and strengthening of multi-apartment building management bodies
- National Assembly of Armenia for improving legal and regulatory framework aimed at strengthening the role of the condominiums and promoting the implementation of energy efficiency measures in district heating
- Public Services Regulatory Commission (PSRC) that has authority to regulate energy prices, including feed-in-tariffs
- Condominiums
- Local civil society organizations
- District heating and energy service companies
- Mass media to increase public awareness
- World Bank, US AID and other donors' funded projects in energy and heating sectors

3.5 Results expected

The Project Document specified expected project results – project outputs for each of the project component that relates to each of the project immediate objective.

Immediate objective/outcome 1:

Strengthening the role of the condominiums or other forms of consumer associations in organizing and managing the heat and hot water supply services collectively at the building level

- Output 1.1 Improved legal and regulatory framework to strengthen the role of the condominiums
- Output 1.2 Strengthened capacity of the condominiums or other forms of consumer associations to manage their operations and to organize the heat and hot water supply services collectively at the building level.

Immediate objective/outcome 2:

Supporting the restructuring process and building the capacity of the existing DH companies to improve the efficiency of their operations

- Output 2.1 Implementation strategy to improve the energy efficiency of the existing DH companies and to facilitate their gradual restructuring and commercialization
- Output 2.2 Improved legal and regulatory frameworks to encourage and support the improved energy efficiency of the existing DH services and the commercial operation of the remaining DH companies

- Output 2.3 Consumption based metering and billing system adopted by the remaining DH companies
- Output 2.4 Strengthened capacity of the management and the operating personnel of the DH companies to improve the efficiency of their operations

Immediate objective/outcome 3:

Supporting the emerging new service providers in offering their services to the condominiums and structuring financing for the investments needed

- Output 3.1 Improved legal and regulatory framework to encourage the new, decentralized service providers to enter the heat and hot water supply market
- Output 3.2 Strengthened capacity of the emerging, new service providers to develop “bankable” investment proposals, to structure financing for the projects and, as needed, to manage the commercially sustainable operation of the companies otherwise
- Output 3.3 A certification system for qualified service and equipment providers

Immediate objective/outcome 4:

Utilizing the results, experiences and lessons learnt for advancing the sustainable development of the heat and hot water services in Armenia with a specific emphasis on the GHG reduction aspects

- Output 4.1 A system for monitoring the GHG emission reductions of the proposed pilot/demonstration projects and assessment of GHG removal as a result of the avoided deforestation
- Output 4.2 Norms and enforce mechanisms for preventing the unsustainable use of forest resources as wood fuel
- Output 4.3 Compilations, evaluations and analyses of experiences and lessons learned under the project.
- Output 4.4 Project results, experiences and lessons learnt, disseminated at the national and regional levels.

Due to the continuing collapse of district heating schemes between 2003 when the project has been approved and 2005 when the project officially started, municipalities started to lease heating substations and small boiler houses to private investors. During the inception phase the project has reflected these changes on the market and has revised outputs of project component 2 as follows:

Newly defined project outputs under immediate objective/outcome 2: *Supporting the restructuring process and building the capacity of the existing DH companies to improve the efficiency of their operations:*

- Output 2.1 Municipal strategies to improve the heat and hot water supply services to the population.
- Output 2.2: Strengthened capacity of the municipalities to manage the remaining assets of the former DH systems and to facilitate the further development of the heat and hot water supply services.
- Output 2.3: Improve legal and regulatory framework for increasing energy efficiency of heat supply systems.

With expansion of natural gas distribution networks into multiapartment buildings the use of firewood for heating was significantly reduced and the Output 4.2 “*Norms and enforcement mechanisms for preventing the unsustainable use of forest wood as fuel*” has become less relevant.

New private investors in district heating preferred to conclude contracts directly with apartment owners rather than with condominiums. The condominiums role was effectively bypassed and the need to strengthen their role in organizing heat and hot water services collectively at the multiapartment building level became superfluous, at least for the time being.

Thus, based on recommendations of the MTE in 2008, activities under component 1: *Strengthening the role of the condominiums or other forms of consumer associations in organizing and managing the heat and hot water supply services collectively at the building level* have been proposed to be given a “low priority”, and Output 4.2 “*Norms and enforcement mechanisms for preventing the unsustainable use of forest wood as fuel*” has been fully suspended.

Expected project results revised after the inception phase and the mid-term evaluation consist of 4 project components, revised outputs in component 2 and suspended output 4.2.

Revised project outputs:

Immediate objective/outcome 1:

Strengthening the role of the condominiums or other forms of consumer associations in organizing and managing the heat and hot water supply services collectively at the building level

Output 1.1 Improved legal and regulatory framework to strengthen the role of the condominiums

Output 1.2 Strengthened capacity of the condominiums or other forms of consumer associations to manage their operations and to organize the heat and hot water supply services collectively at the building level.

Immediate objective/outcome 2:

Supporting the restructuring process and building the capacity of the existing DH companies to improve the efficiency of their operations:

Output 2.1 Municipal strategies to improve the heat and hot water supply services to the population.

Output 2.2: Strengthened capacity of the municipalities to manage the remaining assets of the former DH systems and to facilitate the further development of the heat and hot water supply services.

Output 2.3: Improve legal and regulatory framework for increasing energy efficiency of heat supply systems.

Immediate objective/outcome 3:

Supporting the emerging new service providers in offering their services to the condominiums and structuring financing for the investments needed

Output 3.1 Improved legal and regulatory framework to encourage the new, decentralized service providers to enter the heat and hot water supply market

Output 3.2 Strengthened capacity of the emerging, new service providers to develop “bankable” investment proposals, to structure financing for the projects and, as needed, to manage the commercially sustainable operation of the companies otherwise

Output 3.3 A certification system for qualified service and equipment providers

Immediate objective/outcome 4:

Utilizing the results, experiences and lessons learnt for advancing the sustainable development of the heat and hot water services in Armenia with a specific emphasis on the GHG reduction aspects

Output 4.1 A system for monitoring the GHG emission reductions of the proposed pilot/demonstration projects and assessment of GHG removal as a result of the avoided deforestation

Output 4.2 *Suspended*

Output 4.3	Compilations, evaluations and analyses of experiences and lessons learned under the project.
Output 4.4	Project results, experiences and lessons learnt, disseminated at the national and regional levels.

Main activities of the project were targeted to local authorities for:

- implementing and managing heat supply services;
- improvement of the regulatory framework to promote energy efficient and environment friendly heat supply solutions;
- creation of favorable business environment for attracting private investments;
- commercialization of heat supply services;
- introduction of energy efficient advanced technologies and renewable energy sources in the heat supply sector;
- awareness raising, knowledge sharing and replication of experience.

4. Findings and conclusions

4.1 Project Formulation

4.1.1 Project Relevance and Implementation Approach

As discussed in *Chapter 3.1 Problems that the project seeks to address*, Armenia has witnessed severe collapse of district and building level heating services that hit primarily but not only multiapartment residential buildings. The scope of this district heating disintegration was extraordinary even in the context of other former Soviet republics due to energy import blockade in 1990s.

The old centralized district heating services were inefficient, with no heat controls and without any consumption based billing. Despite of the *potential* of district and building level heating solutions to be energy efficient, cost-effective and accommodate co-generation or solar heating solutions to decrease GHG and pollutant emissions, old district heating schemes in the Armenian context did not utilize this potential and thus had a very poor reputation.

In addition to the collapse of district heating, its poor reputation and wide-spread individual apartment level solutions, barriers to building level heating solutions in existing multiapartment buildings include low average income (average monthly salary in November 2011 was 300 USD, source news.am), large share of low-income households (36% of population living below the national poverty line in 2010, source: worldbank.org), and a large share of unoccupied apartments in multiapartment buildings (in some cases up to 50% apartments are unoccupied and owners work abroad, source: interview with Mr. Georgi Yeremyan, Deputy Mayor, Aparan municipality).

The project aim to restore affordable, sustainable and effective building level and (small-scale) district heating services that would reduce GHG emissions is thus *highly relevant but very ambitious* in the same time.

Experience from other countries indicates that modern, efficient individual apartment level heating solutions based on natural gas can be and often are a feasible and competitive alternative to district or even building level heating and hot water solutions, also in terms of emissions, although they require upfront investment of apartment owners. However, especially in existing high-rise multiapartment buildings in Armenia, the lack of built-in smoke stacks and poor enforcement of safety regulations create an additional risk for individual apartment level solutions based on natural gas.

The implementation approach as it was specified in the Project Document properly addressed key barriers identified in the Project Document and *potential* benefits of building level and/or district heating solutions. During the implementation period several project outputs and implementation activities have been redesigned to reflect the changing conditions on the market, as well as more detailed experience gained during project implementation. These changes are described in detail in Chapters 3.5 and 4.3.

This project in its initiation phase in 1998 was among the first ones, if not the very first one, focusing on restoration of building level and/or district heating systems in a country with such a scale of disintegration of old district heating schemes.

The rating of the project relevance and implementation approach is ***Highly Satisfactory***.

Highly Satisfactory	Satisfactory	Moderately Satisfactory	Moderately Unsatisfactory	Unsatisfactory	Highly Unsatisfactory
HS					

4.1.2 Analysis of Logical Framework (project logic/strategy, indicators)

During the project approval process, and in response to the US Council member comments, the project has supplemented its Project Planning Matrix that specified project indicators with the Monitoring and Evaluation Plan that included also targets for each indicator (targets included both the overall project targets called Success Indicators, and intermediate targets, called Intermediate Benchmarks). Project targets were specified for each project output in principle as SMART indicators. The wording of project indicators (targets) relevant to the overall project development goal remained unchanged, however only one of five of these targets has been defined sufficiently SMART (Specific, Measurable, Achievable, Reliable, Time-bound).

After project inception the logical framework has been revised and output indicators and targets have been replaced with more general outcome indicators and targets. Two indicators and targets have been specified for the overall project development goal.

During the first phase of the project implementation period until the Mid-Term Evaluation, project indicators used in Annual Work Plans have been changed on an annual basis.

The changing specification of project indicators and targets is confusing and make it practically impossible to track the project performance against stable project indicators over the whole project implementation period.

Project indicators and targets reflect the project logic and strategy only to a limited level: they do not provide a full picture of project achievements within project objectives and activities performed. In some cases project indicators are quite similar and relate to the same or similar achievements (2012 PIR Indicator 3 – Number of heat contracts with condominiums and Indicator 7 - Number of heat contracts with clients).

Project indicators and targets are defined only for the outcome level. More detailed specification of project indicators and targets on an output level would provide better picture of project achievements – at least for annual evaluation of project results.

Rating of the Logical Framework is ***Moderately Unsatisfactory***.

Highly Satisfactory	Satisfactory	Moderately Satisfactory	Moderately Unsatisfactory	Unsatisfactory	Highly Unsatisfactory
			MU		

4.1.3 Lessons from other relevant projects incorporated into project implementation

The project has worked closely since the project development phase with all other relevant projects and activities, namely with the World Bank “Urban Heating Strategy” project (lately with the Armenian Renewable Resources and Energy Efficiency Fund (R2E2), US AID funded project “Energy Efficiency and Renewable Energy Sources” and support to heating sector in Armenia, Japanese “Utility Restructuring Project”, and “ArmNedHeat - Development of the DH Industry in Armenia” project funded by the government of Netherlands.

The project has provided technical assistance to the World Bank project and closely cooperates also with the R2E2 Fund. In addition to this, representatives of the World Bank, US AID, UNIDO, and the Renewable Resources and Energy Efficiency Fund Director are members of the Steering Committee of the UNDP/GEF project.

The experience and lessons from these international projects have been available for the project team and incorporated into its implementation and vice versa.

4.1.4 Country ownership/driveness

The project has been initiated and developed locally by UNDP Armenia and by local experts who were assisted by international consultants. The project received full support from the government of Armenia, namely the Ministry of Nature Protection.

The country ownership and driveness is rated ***Highly Satisfactory***.

Highly Satisfactory	Satisfactory	Moderately Satisfactory	Moderately Unsatisfactory	Unsatisfactory	Highly Unsatisfactory
HS					

4.1.5 Stakeholder participation in the design phase

Local project stakeholders including governmental agencies and ministries, namely Ministry of Nature Protection, Ministry of Energy and Natural Resources, Ministry of Urban Development, local municipalities (Yerevan municipality) have been actively involved already during the project preparatory phase.

Consultations and coordination with other international donors active in the heating sector, namely the World Bank and the US AID, played an important role in project formulation, as well as in project implementation later on (namely cooperation with the World Bank financed project and later established Armenian Renewable Resources and Energy Efficiency Fund).

Stakeholder participation in the design phase is rated ***Highly Satisfactory***.

Highly Satisfactory	Satisfactory	Moderately Satisfactory	Moderately Unsatisfactory	Unsatisfactory	Highly Unsatisfactory
HS					

4.1.6 Replication approach and sustainability strategy

The project document explicitly defined replication and sustainability strategy that was based on overcoming barriers identified in the project development phase and was based on:

- technical assistance activities that are intended to lay the necessary foundation of a supportive legal and regulatory framework, institutional structures and national capacities to initiate, develop and manage sustainable heating and hot water supply services;
- implementation of selected activities associated with the energy efficiency of DH in condominiums to provide the opportunity to gain experience with, and thereby reduce the associated risks and demonstrate the benefits of similar projects that improve comfort levels and reduce heating costs for tenants;
- monitoring and evaluation of the project implementation and results, thereby providing lesson learned for future action; and
- ongoing public awareness raising efforts and effective dissemination of the project results.

Low income level and large share of low-income households was identified in the Project Document as one of the main risks to project results sustainability. The project document assumed that this risk will be overcome by focusing on affordable heating solutions, and that the government with the support of the World Bank Urban Heating Project will implement targeted support scheme for low-income households.

Replication approach and sustainability is rated *Satisfactory*.

Highly Satisfactory	Satisfactory	Moderately Satisfactory	Moderately Unsatisfactory	Unsatisfactory	Highly Unsatisfactory
	S				

4.1.7 Cost-effectiveness

The Project Document has estimated CO₂ reduction costs to the GEF to be 0.3 USD per ton of CO₂ reduced over the period of 20 years based on the estimated overall replication and GHG reduction potential. Taking into account first demonstration projects only, the CO₂ reduction costs have been estimated at 4.2 USD per ton of CO₂.

The designed cost-effectiveness of the project in terms of GEF costs per ton of estimated lifetime CO₂ reductions is rated *Highly Satisfactory*.

Highly Satisfactory	Satisfactory	Moderately Satisfactory	Moderately Unsatisfactory	Unsatisfactory	Highly Unsatisfactory
HS					

4.1.8 UNDP comparative advantage

UNDP Armenia has the administrative capacity and expertise to implement municipal heating and hot water supply project, is a neutral implementing agency and can benefit from synergy of portfolio of projects under implementation in an environmental governance focus area.

UNDP comparative advantage is rated *Satisfactory*.

Highly Satisfactory	Satisfactory	Moderately Satisfactory	Moderately Unsatisfactory	Unsatisfactory	Highly Unsatisfactory
	S				

4.1.9 Linkages between the project and other interventions within the sector

The project goal was in line with the policy of the Government of Armenia “Urban Heating Strategy” supported by the World Bank project and adopted in 2002 and subsequent governmental interventions and decisions including the 2002 governmental decree on “Reforms in Urban Heating System”, and governmental decisions on “Leasing of Heat Supply Facilities” (2003), and “Transfer of Heat Supply Assets to Yerevan Municipality” (2003).

The national policy in heating sector was supported also by international donors, namely the World Bank, “Industrial Development of the DH Industry in Armenia” project funded by the government of Netherlands, US AID and others.

However, the national urban heating policy is not fully consistent with other governmental interventions. In the same time the government supported also construction of new natural gas distribution networks to multiapartment buildings and purchase and installation of individual apartment level heating solutions (gas heaters and stoves) in multiapartment buildings that deteriorated the potential for building level and district heating reconstruction.

Linkages between the project and other interventions within the sector are rated *Satisfactory*.

Highly Satisfactory	Satisfactory	Moderately Satisfactory	Moderately Unsatisfactory	Unsatisfactory	Highly Unsatisfactory
	S				

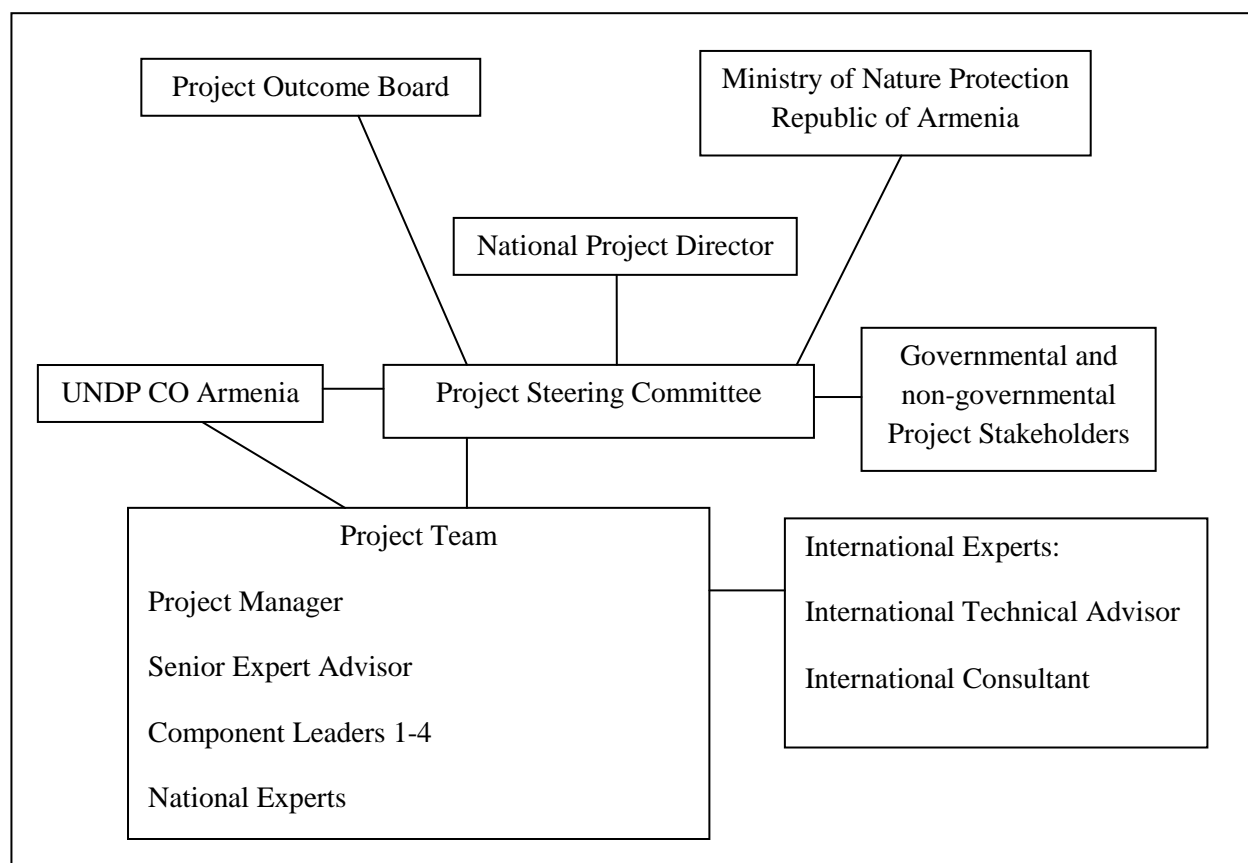
4.1.10 Management arrangements

The Ministry of Nature Protection of the Republic of Armenia has been assigned to serve as the project executing agency; UNDP Armenia has served as an implementing agency. Ministry of Nature Protection of the Republic of Armenia, the executing agency, has also appointed a National Project Director.

A Project Steering Committee, responsible for strategic guidance, and co-ordination of the project with other national activities, has been established to oversee project implementation and was composed of top-level policy and decision makers from national ministries and other governmental and non-governmental bodies as well as representatives of other donors.

Project Outcome Board has been established as the highest decision making body and consists of the representatives of the Ministry of Nature Protection and UNDP.

Chart 1: Project Management Structure



The Project Team consists of the Project Manager, Senior Expert Advisor, Component Leaders and National Experts. The Project Team receives support from International Technical Advisor and International Consultants hired for specific project tasks.

A total of 33 national experts were hired during different phases of project implementation, mostly on a part-time basis. In the peak periods an equivalent of 5-6 full-time national experts worked on the project.

Management arrangements are rated *Satisfactory*.

Highly Satisfactory	Satisfactory	Moderately Satisfactory	Moderately Unsatisfactory	Unsatisfactory	Highly Unsatisfactory
	S				

4.2 Project Implementation

4.2.1 Implementation approach

The project implementation approach focused on achieving project development goal to “lay the institutional and financial foundation for and to remove other key barriers to the sustainable development of the heat and hot water supply services in Armenia, thereby reducing their GHG emissions and improving their quality and affordability to the customers”.

Project activities have been structured within the four project outcomes:

Project outcome 1: Strengthening the role of the condominiums or other forms of consumer associations in organizing and managing the heat and hot water supply services collectively at the building level

Activities under Outcome 1 have been minimized based on recommendation of the MTE because condominiums are not financially credible partners for heat service suppliers. Instead of condominiums heat suppliers preferred to conclude contracts directly with apartment owners.

One of the key barriers for strengthening the role of condominiums is a large share of low-income households and in some cases also a large share (up to 50% in individual cases) of uninhabited apartments.

The goals of outcome 1 have not been reached, but an alternative solution was undertaken that bypass condominiums as potential contracting partners.

Project outcome 2: Supporting the restructuring process and building the capacity of the existing DH companies to improve the efficiency of their operations:

Most of remaining residential district heating schemes have been leased to private investors. Municipalities and the state have also some role in financial support of multiapartment condominiums, and notably in case of public facilities. The project has worked closely with active municipalities in developing and implementing pilot projects.

Project outcome 3: Supporting the emerging new service providers in offering their services to the condominiums and structuring financing for the investments needed

The project has worked with private service providers, facilitating investment, developing heating projects, and preparing feasibility studies. One of key project activities included development of regulations that support feasible implementation of district heating solutions. Methodology of feed-in-tariffs has been prepared and adopted by the PSRC. However, in 2010 the PSRC the system of preferential FIT has cancelled. A certification system for domestic energy appliances including heat boilers and heaters and air-conditioners has been developed.

Project outcome 4: Utilizing the results, experiences and lessons learnt for advancing the sustainable development of the heat and hot water services in Armenia with a specific emphasis on the GHG reduction aspects

A methodology on GHG monitoring of pilot projects has been developed, pilot fact sheets have been published, and project results information dissemination activities implemented.

The overall rating of implementation approach is **Satisfactory**.

Highly Satisfactory	Satisfactory	Moderately Satisfactory	Moderately Unsatisfactory	Unsatisfactory	Highly Unsatisfactory
	S				

4.2.2 The logical framework used during implementation as a management and monitoring and evaluation tool

Project indicators and targets were regularly used during project implementation as a monitoring and evaluation tool for annual reporting of project achievements in the combined Annual Project Review and Project Implementation Reports. However, as discussed in the Chapter 4.1.2, the specification of project indicators was changed on an annual basis, especially in early phases of project implementation, and thus the continuity of project achievements monitoring was difficult to follow.

For daily project management the logical framework is by definition rather general tool. LogFrame project indicators and targets should relate to overall project achievements (outcomes, outputs) and thus they do not and cannot fully reflect all annual activities.

For daily project management annual plans with specified project activities and responsibilities have been prepared for project team members.

The use of logical framework during implementation as a management and monitoring and evaluation tool is rated *Satisfactory*.

Highly Satisfactory	Satisfactory	Moderately Satisfactory	Moderately Unsatisfactory	Unsatisfactory	Highly Unsatisfactory
	S				

4.2.3 Effective partnerships arrangements established for implementation of the project with relevant stakeholders involved in the country

The project has established effective partnership both on a Steering Committee level as well as on a working level with all relevant local stakeholders and international donors active in the heating sector, including namely the Ministry of Nature Protection, the World Bank project, Armenian Renewable Resources and Energy Efficiency Fund, Public Services Regulatory Commission, Municipalities of Yerevan (Avan district), Aparan, Spitak as well as other project partners.

The project did not succeed to persuade policy makers and the government to adopt all proposed legislation and regulation that would provide support for district heating/cogeneration solutions. More active involvement of Ministry of Energy and Natural Resources combined with its responsibility for successful project implementation might have helped the project policy agenda to be adopted.

Partnerships arrangements established for implementation of the project with relevant stakeholders is rated *Satisfactory*.

Highly Satisfactory	Satisfactory	Moderately Satisfactory	Moderately Unsatisfactory	Unsatisfactory	Highly Unsatisfactory
	S				

4.2.4 Feedback from M&E activities used for adaptive management

The project has implemented effective adaptive management. The scope of the project, lengthy period of project preparation, eight year project implementation period and rapidly changing conditions on the heating market in Armenia required effective adaptive management – without it the project could not have been implemented successfully. The project manager and the project team implemented pro-active management and adjusted the project activities accordingly to specific and changing needs.

Project activities have been adjusted on an annual basis and approved by the Steering Committee and Project Outcome Board. More crucial changes have been adopted based on recommendations of the Inception Report and Mid-term Evaluation Report.

Successful implementation of pilot projects, namely the partnership with a private investor in Avan district of Yerevan who reconstructed district heating system and installed new cogeneration units, as well as cooperation with Aparan municipality, proves that flexible and result-oriented project management was truly successful.

Practically all recommendations of the MTE report have been taken into account and incorporated into subsequent project implementation. Implementation of recommendations of the MTE to strengthen sustainability strategy and to mobilize interest of policy makers to adopt policies and regulations supporting sustainable heating solutions (heat law, feed in tariffs etc) had limited success.

One of the most important changes in project implementation recommended by the MTE was resignation on implementation of the goals of component 1 – strengthening condominiums to organize and manage collectively heat services at the building level. This might be considered to be inadequate taking into account the fact that condominiums do play a critical role in all building level maintenance and reconstruction activities, not only concerning heating but including any potential future energy efficiency improvements of the building. However, the private investors to district heating consider individual apartment owners to be more credible clients than current condominiums and have decided to conclude heating contracts directly with them bypassing condominiums. In such case, the condominiums are not critical partners for heating service providers in contractual terms, at least not in current situation in Armenia.

The feedback from M&E activities used for adaptive management is rated *Satisfactory*.

Highly Satisfactory	Satisfactory	Moderately Satisfactory	Moderately Unsatisfactory	Unsatisfactory	Highly Unsatisfactory
	S				

4.2.5 Financial planning and management

The evaluator has found project financial management, including financial plans and reports to be professionally organized and maintained.

The project has been subject to three external financial audits covering the period of calendar years 2007, 2009 and 2010. The financial audits state that the Statement of Assets and Equipment, Statement of Expenditure and Combined Delivery Reports are presented fairly in accordance with UNDP accounting requirements.

In addition to the standard UNDP financial planning and reporting tools and formats, the project financial assistant uses her own spreadsheet to plan and record project financial expenditures paid directly by the

project. Thus the project management has up-to-date easily accessible overview of detailed project budget, financial commitments, real expenditures and actual balance – per individual expenditures.

Total project budget is 2 950 000 USD. The original planned budget as of the project document is shown in Table 3.

Table 3: Project Budget as of Project Document

	<u>2005</u>	<u>2006</u>	<u>2007</u>	2008	Total
<u>Output 1</u>	<u>147 000</u>	<u>215 500</u>	<u>194 500</u>	0	557 000
<u>Output 2</u>	<u>273 300</u>	<u>440 000</u>	<u>298 700</u>	0	1 012 000
<u>Output 3</u>	<u>179 500</u>	<u>252 500</u>	<u>236 000</u>	0	668 000
<u>Output 4</u>	<u>0</u>	<u>28 100</u>	<u>196 400</u>	145 500	370 000
<u>Output 5</u>	<u>87 000</u>	<u>87 000</u>	<u>84 000</u>	85 000	343 000
Total	686 800	1 023 100	1 009 600	230 500	2 950 000

Each year a new annual budget has been prepared for the next year and submitted for approval to the Steering Committee in the form of Annual Work Plan. These annual budgets as shown in AWP are summarized in the following table.

Table 4: Annual Project Budgets as of AWP

	2005	2006	2007	2008	2009	2010	2011	2012
Output 1	166 700	107 000	101 000	146 000	123 500	37 000	31 300	15 200
Output 2	87 700	285 000	251 000	415 000	264 600	109 000	105 000	59 900
Output 3	100 600	130 000	168 000	222 000	82 700	60 000	99 900	36 026
Output 4	51 000	38 000	60 000	86 000	56 200	55 696	26 800	16 200
Output 5		80 000	70 000	115 000	73 000	40 000	38 926	19 500
Total	406 000	640 000	650 000	984 000	600 000	301 696	301 926	146 826

Note: The total of annual budgets does not make the total project budget.

Outputs 1-4 refer to project components 1-4

Output 5 refers to “Project implementation, monitoring and evaluation”

The Table 5 shows annual project expenditures by project outcome for each year of project implementation period. The expenditures in 2012 combine actual expenditures as of July 2012 and committed expenditures.

Total project expenditures over the whole project implementation period till July 2012, including committed expenditures, are **2 929 586 USD**. The remaining free unspent resources are **20 414 USD** as of July 2012.

Table 5: Annual expenditures by project outcomes and years

	2005	2006	2007	2008	2009	2010	2011	2012	Total
1	33 215	69 757	58 000	102 889	100 883	107 012	19 216	15 200	506 172
2	23 282	151 354	188 196	172 752	178 131	215 639	62 726	59 900	1 051 980
3	3 228	51 679	177 886	130 404	80 482	178 934	149 111	36 026	807 749
4	0	17 305	36 767	15 109	18 756	60 063	26 700	16 200	190 900
5	27 446	49 388	45 496	61 582	59 009	47 988	43 286	19 500	353 695
Incumbance, exchange rate	177	2 081	28 603	-13 752	15 971	5 538	-19 528	0	19 089
Total	87 348	341 563	534 948	468 983	453 232	615 174	281 512	146 826	2 929 586

Some of the project expenses do not seem to be directly linked with the project goal, such as the travel costs to attend UN Climate Change talks in Bonn on May 14-26, 2012 (specifically technology transfer and NAMAs sessions). The total travel costs were 5 592 USD.

Financial planning is rated *Satisfactory*.

Highly Satisfactory	Satisfactory	Moderately Satisfactory	Moderately Unsatisfactory	Unsatisfactory	Highly Unsatisfactory
	S				

4.2.6 Monitoring and evaluation

The project was subject to standard UNDP/GEF regular project monitoring and evaluation including Quarterly Progress Reports and Work Plans approved by the Steering Committee and the National Project Director, Project Annual Reviews and Project Implementation Reports.

Summary of annual implemented project activities were regularly reported to and approved by the Steering Committee.

The Steering Committee was held regularly once a year on 16 August 2005, 12 September 2006, 29 May 2007, 27 June 2008, 8 July 2009, 21 July 2010, and on 26 July 2011.

The Steering Committee consists of high-level policy and decision makers from national ministries, UNDP and other key stakeholders and was typically represented by heads of these offices - ministers and first deputy ministers, UNDP resident and deputy resident representatives, etc. The Steering Committee is co-chaired by the Minister of Ministry of Nature Protection and the UNDP Resident Representative.

Members of the Steering Committee include: Ministry of Nature Protection, UNDP, Ministry of Energy and Natural Resources, Ministry of Finance, Ministry of Urban Development, Ministry of Economy, Ministry of Territorial Administration, Ministry of Labor and Social Affairs, Ministry of Agriculture, Public Services Regulatory Commission, Armenia Renewable Resources and Energy Efficiency Fund, Yerevan Municipality, UNIDO, World Bank, US AID, Public Advocacy Union, and Chamber of Commerce and Industry.

Project Outcome Board, consisting of representatives of Ministry of Nature Protection and UNDP, was established to serve as the highest decision making body. Typically recommendations of the Steering Committee were submitted to the Project Outcome Board for final decision.

The project was subject to three external financial audits. Financial audits found minor accounting issues that have been properly resolved subsequently.

In 2008, the fourth year of project implementation (i.e. the last year of originally planned project implementation period, but in the middle of actual implementation period), the Mid-Term Evaluation has been conducted.

The project monitoring and evaluation is rated *Satisfactory*.

Highly Satisfactory	Satisfactory	Moderately Satisfactory	Moderately Unsatisfactory	Unsatisfactory	Highly Unsatisfactory
	S				

4.2.7 Management by the UNDP country office

The project was implemented by UNDP Armenia. The project team had a seat of the project office in the premises of the Climate Change Information Center of Armenia hosted in the governmental building by Ministry of Nature Protection, i.e. outside of the UNDP country office in Armenia.

The UNDP country office provided full support to project implementation, including administrative support as well as high level support by participation in the Steering Committee of the UNDP resident and deputy resident representatives.

According to the MTE, in early phase of project implementation the project faced some bureaucratic burdens imposed by UNDP country office especially in slow hiring of project staff, lengthy contracting and procurement procedures, and a requirement to frequently rehire project staff. These bureaucratic procedures delayed project start and negatively influenced effective operation of the project Advisory Center.

After MTE which highlighted this issue, implementation of these procedures became more flexible, and the project team also initiated any further hiring/contracting with sufficient time reserve.

The cooperation with UNDP staff on a daily basis was reported to be sufficiently responsive.

Management by the UNDP country office is rated *Moderately Satisfactory*.

Highly Satisfactory	Satisfactory	Moderately Satisfactory	Moderately Unsatisfactory	Unsatisfactory	Highly Unsatisfactory
		MS			

4.2.8 Co-financing and in-kind contributions

The project budget is 2.95 mil USD from GEF grant, GEF provided additional grant of 0.21 mil USD for PDF B.

Government of Armenia, the Ministry of Nature Protection provided 0.2 mil USD in-kind contribution (mainly for office space).

The Table 6: Financial Planning Co-financing summarizes project co-financing provided.

7.57 mil USD of planned other grants include 7 mil USD from the USAID and 0.57 mil USD from the government of Netherlands project

1.57 mil USD of actual other grants includes 1 mil USD actually financed by the USAID and 0.57 mil USD from the government of Netherlands

1 mil USD of other planned credit include PPF for WB financed Heating Project

10 mil USD of other actual credit include WB financed Urban Heating Project

10.888 mil USD of other co-financing includes:

10.715 mil USD – private investments for 3 cogeneration-based projects and 2 solar hot water projects

0.173 mil USD – of which 0.16 mil USD grant from Czech Trust Fund, and the rest from Armenian Church foundation, and R2E2 Fund

0.234 mil USD - pilot projects with municipalities and social institutions (considering as Government money)

Disbursement includes 0.21 mil USD PDF B grant

Table 6: Financial Planning Co-financing

Co financing (Type/Source)	IA own Financing (mill US\$)		Government (mill US\$)		Other* (mill US\$)		Total (mill US\$)		Total Disbursement (mill US\$)	
	Planned	Actual	Planned	Actual	Planned	Actual	Planned	Actual	Planned	Actual
– Grants					7.57	1.57	7.57	1.57	3.16	3.125
– Loans/Concessional (compared to market rate)										
– Credits					1	10	1	10		
– Equity investments				0.234				0.234		
– In-kind support			0.2	0.2			0.2	0.2		
– Other (*)						10.888		10.888		
Totals			0.2	0.434	8.57	22.458	8.77	11.322		

* Other is referred to contributions mobilized for the project from other multilateral agencies, bilateral development cooperation agencies, NGOs, the private sector and beneficiaries.

4.3 Results

4.3.1 Attainment of objectives

Project goal: *To lay the institutional and financial foundation and to remove other key barriers to the sustainable development of the heat and hot water supply services in Armenia, thereby reducing their GHG emissions and improving their quality and affordability to the customers.*

Indicator 1: Amount of investments leveraged for restoring the heat and hot water supply services on the basis of energy efficient central water heating systems, including the possibility for increasing use of co-generated electricity and heat

Target 1: At least USD 10 million worth of additional investments leveraged by the project for sustainable heat and hot water supply systems.

Achievement: *10.7 mil USD leveraged (with GEF investment of 0.773 mil USD in pilot projects), 16.4 mil USD including projects under development.*

Rating: *The target has been achieved. Highly Satisfactory.*

Indicator 2: Amount of cumulative GHG reduction by the end of the project compared to the set baseline.

Target 2: 0.7 mil tons of CO₂ reduced as a direct impact of the project (lifetime)

Achievement: *0.89 mil t CO₂ lifetime reductions (including 0.24 mil t CO₂ from pilot projects and 0.65 mil t CO₂ from projects supported by the GEF project and financed by the WB - IBDA and other donors)*

Rating: *The target has been achieved. Highly Satisfactory.*

Outcome 1: *Strengthened capacity of the condominiums or other forms of consumer associations to manage their operations and to organize the heat and hot water supply services collectively at the building level.*

Indicator 3: Number of signed contracts within the condominium as well as between the service providers and condominiums for the provision of heat and hot water supply services.

Target 3: 80 new contracts

Achievement: *No contracts were signed with condominiums, but directly between service providers and end-customers. In total 664 individual contracts in residential sector (300 Avan, 94 Yeraz, 70 solar water, 200 Aparan) have been signed as indicated in achievement of target 7. (With 30 apartments per building it would be an equivalent of 22 buildings).*

Rating: *Unsatisfactory. However this target became irrelevant when heat suppliers decided to conclude contracts directly with individual apartment owners.*

Outcome 2: *The capacity of the local municipalities built to develop and implement sustainable heat and hot water supply plans and to manage the remaining assets of the former district heating systems.*

Indicator 4: The number of districts/cities, which have developed and adopted a sustainable heat and hot water supply plan

Target 4: 10
 Achievement: 6 municipal heat plans, 8 feasibility studies, 11 pre-feasibility studies were developed
 Rating: The target has not been achieved. Moderately Unsatisfactory.

Indicator 5: The number of concrete investment projects for the restoration of the heat and hot water supply services being developed.

Target 5: 10

Achievement: 24 pilot projects developed, of which 20 implemented, 3 under implementation, 1 project was suspended. 8 small-scale heat only DH, 10 solar hot water systems, 1 infrared heating, 1 heat pumps projects implemented, Avan CHP residential DH – first phase in operation, Medical University CHP and Meghri Medical Center solar system under implementation. Sevan CHP DH suspended.

Rating: The target has been exceeded. Highly Satisfactory.

Indicator 6: Number of citizens having access to restored central water heating and hot water supply services

Target 6: 2400 citizens

Achievement: 5 000 citizens in residential and public buildings, of which 2 399 citizens in residential buildings only

Rating: The target has been achieved. Highly Satisfactory.

Outcome 3: Strengthened capacity of the new energy service providers in offering their services to the condominiums and structuring financing for the investments needed.

Indicator 7: Contracts for heat supply concluded between new service providers and clients.

Target 7: 20

Achievement: In total 664 individual contracts (300 Avan, 94 Yeraz, 70 solar water, 200 Aparan)

Note: With 30 apartments per condominium, the target would cover some 600 individual contracts with apartment owners.

Rating: The target has been achieved. Highly Satisfactory.

Outcome 4: The results, experiences and lessons learnt documented and effectively disseminated

Indicator 8: Final project report documenting the results, experiences and lessons learned published and distributed.

Target 8: 1 final report

Achievement: One final report on lessons learned has been drafted, final version is planned to be distributed after final evaluation.

Rating: Target has been achieved. Satisfactory.

Indicator 9: Expressions of interests to replicate the project activities at the national and regional level.

Target 9: 10 expressions of interest

Achievement: 8 municipalities, 8 social facilities and 13 investors expressed their interest to implement projects in Armenia. Tariff calculation methodology was shared

internationally in the region - Kazakhstan requested a copy of the detailed methodology

Rating: The target has been met. Highly Satisfactory.

Table 7: Summary overview of target achievements

Target #	Target	Achievements and ratings
Project objective: To lay the institutional and financial foundation and to remove other key barriers to the sustainable development of the heat and hot water supply services in Armenia, thereby reducing their GHG emissions and improving their quality and affordability to the customers		
1	10 mil USD investments leveraged for sustainable heat and hot water supply systems	10.7 mil USD leveraged. Highly Satisfactory.
2	0.7 mil tons of CO ₂ reduced as a direct impact (lifecycle)	0.89 mil t CO ₂ . Highly Satisfactory.
Outcome 1: Strengthened capacity of the condominiums or other forms of consumer associations to manage their operations and to organize the heat and hot water supply services collectively at the building level		
3	80 new contracts signed with condominiums on heat supply	No contract with condominiums signed. (664 individual contracts in residential sector signed – of which about 10 buildings operated by condominiums as shown in target 7). Unsatisfactory – however, the target is irrelevant.
Outcome 2: The capacity of the local municipalities built to develop and implement sustainable heat and hot water supply plans and to manage the remaining assets of the former district heating systems		
4	10 districts/cities have developed and adopted a sustainable heat and hot water supply plan	6 municipal heat plans, 8 feasibility studies, 11 pre-feasibility studies were developed. Moderately Unsatisfactory.
5	10 investment projects for the restoration of the heat and hot water supply services developed	24 pilot projects developed and implemented. Highly Satisfactory.
6	2400 citizens have access to restored central water heating and hot water supply services	5 000 citizens in residential and public buildings, of which 2 399 citizens in residential buildings only. Highly Satisfactory.
Outcome 3: Strengthened capacity of the new energy service providers in offering their services to the condominiums and structuring financing for the investments needed		
7	20 contracts for heat supply concluded between new service providers and clients	664 individual contracts signed. Highly Satisfactory.
Outcome 4: The results, experiences and lessons learnt documented and effectively disseminated		
8	1 final project report documenting the results, experiences and lessons learned published and distributed	1 final report on lessons learned drafted. Satisfactory.
9	10 expressions of interests to replicate the project activities at the national and regional level	8 municipalities, 8 social facilities and 13 investors expressed their interest. Highly Satisfactory.

Target ratings are shown in colors:

The target has been achieved - Highly Satisfactory – Satisfactory.

Target has not been achieved – Moderately Unsatisfactory

Activities of the project in Component 1: *Strengthening the role of the condominiums or other forms of consumer associations in organizing and managing the heat and hot water supply services collectively at the building level* have been given low priority based on recommendation of the MTE report. The rationale is that heat service providers preferred to conclude heat supply contracts directly with apartment owners rather than with condominiums. The reason is not only because the condominiums are organizationally and financially rather weak entities, but also that in existing multiapartment buildings there is often a large share of low-income households and even some apartments are not occupied at all because the owners work abroad. If heat suppliers would conclude heat supply contracts with condominiums they would be exposed to additional financial risk of non-payment.

In addition to project achievements reported according to the project indicators and targets and to the key project achievements – implementation of 24 pilot projects, following results have been delivered:

Within the Component 2: *Supporting the restructuring process and building the capacity of the existing DH companies to improve the efficiency of their operations* and Component 3: *Supporting the emerging new service providers in offering their services to the condominiums and structuring financing for the investments needed* the project has developed two normative documents which the PSRC adopted in 2006 as a resolution 168-L and 206-N on “Principles of tariff calculation for cogeneration based on useful heat demand”, and “Methodology for calculating tariffs for heat and power from cogeneration based on useful heat demand”. Additional “Methodology for determining reference values for calculation of efficiency of cogeneration” was developed by the project and adopted by PSRC in 2007. Based on these regulations the price of electricity produced in cogeneration and sold to the national grid was regulated at a preferential rate (feed in tariff) “that should not exceed the tariff of electricity sold by the marginal/most expensive power plant in the national electricity system” (Hrazdan TPP) while the heat price delivered from combined heat and power district heating schemes was set on a competitive level in comparison with individual apartment level natural gas heating solutions. This system of heat regulation on a competitive level and a preferential price for electricity from cogeneration allowed sufficient rate of return for investment in cogeneration based reconstructed district heating systems, such as the Avan pilot project. This methodology however was suspended by the PSRC in 2010 and does not apply anymore for new installations. The Avan project has a special agreement that is still in place (the FIT in Avan is 36.369 AMD/kWh = 0.09 USD/kWh, i.e. 20% lower than the tariff from the marginal plant Hrazdan TPP of AMD 43.6/kWh = 0.11 USD/kWh. End use electricity tariff at the 0.4 kV level is 30 AMD/kWh = 0.07 USD/kWh and 20 AMD/kWh = 0.05 USD/kWh for the night tariff.). This means that under current conditions investment into new cogeneration systems is not attractive enough for new investors. One of the rationales behind the decision to abolish the preferential FITs is that currently there is an overcapacity in the electricity system in Armenia and that electricity generated from new cogeneration does not offset total costs of the marginal power plant but only the operating costs.

The project proposed to the PSRC also a new methodology for natural gas tariff setting. Current tariff for monthly consumption lower than 10 000 m³ of gas is 132 AMD/m³ (0.32 USD/m³), i.e. 32% higher than the tariff for monthly consumption exceeding the 10 000 m³ consumption threshold of 0.24314 USD/m³ (100.3 AMD/m³). Such a big difference in price imposes additional financial risk on district heat suppliers using natural gas if their monthly consumption is close to the monthly threshold and it discourages energy savings. The PSRC is aware of this issue however it had not changed the structure of tariffs yet arguing that “it would lead to price increase” (Source: interview with PSRC Commissioner Mr. Mushegh Koshetsyan).

The project has drafted a Heat Law. However, the legislation has not been adopted.

The project has translated seven international and European (ISO and EN) standards on building environment, energy performance of buildings and heat meters and heating systems. These norms and standards have been adopted in 2010 and 2012.

The project has assisted Ministry of Energy and Natural Resources to implement energy efficiency labeling system for energy consuming household appliances, and has developed a market study, study on international experience, proposed institutional and administrative framework, designed the label and drafted the governmental decisions “On adopting the regulation on energy efficiency labeling of energy consuming household appliances”, including gas heaters, domestic gas boilers, and electricity appliances (air-conditioners, washing machines and refrigerators and freezers). Technical norms and standards on testing energy performance of appliances have been transposed into Armenian and adopted. The labeling legislation is prepared for adoption.

The project has developed updated methodology for emissions calculation of pollutants from solid, liquid and gaseous fuel fired boiler houses of up to 5.8 MW installed capacity. The methodology has been reviewed by MENR and submitted to the Ministry of Nature Protection for approval.

The project has updated the “Construction Climatology” building code with new revised climatic data. The Ministry of Urban Development has adopted the code in 2011.

The project has developed a study on Building Energy Audits and Passport Application Options in Armenia. The study was presented and reviewed by relevant stakeholders and state authorities.

As part of pilot projects billing based on actual heat consumption in individual apartments have been introduced. This concept has been applied as a standard also in newly developed multiapartment building with centralized heating and hot water services.

Within the Component 4: *The results, experiences and lessons learnt documented and effectively disseminated* the project has implemented measurement and monitoring of energy performance of 50 small boiler houses, and in 15 cases low-costs measures were implemented to increase efficiency. In 2009 the project implemented performance analysis and energy audits of 88 large boiler houses, proposed cost-effective energy efficiency improvements with short payback. Based on presentation of these results energy service companies requested the project to develop “Manual on thermo technical testing of gas-fired boilers” that was published in 2012. Based on the manual, the AEG Service energy company has implemented testing and improvements in 18 boiler units in Armenia.

The project has developed and published a 282 page textbook “Renewable Energy Sources and Technologies” for students, designers and developers.

The project has developed a software package and a manual on calculation investment, operation and maintenance costs and heat tariff for small-scale DH systems. The software and manual was distributed to interested housing condominiums and potential private investors into DH rehabilitation.

In 2010 the project has initiated a large-scale statistical survey in the framework of a technical assistance to the WB financed Urban Heating Project “Assessment of Heat Supply Options”.

The project has developed a study on methodology of GHG emission reduction calculation from pilot projects. The methodology was used for calculation actual GHG emission savings.

In addition to pilot projects the project has delivered numerous useful results that were directly and indirectly supporting the overall project objective. The project did deliver the critical piece of regulation (Methodology of FITs) that was adopted by the PSRC in 2006, however in 2010 PSRC decided to cancel it.

Overview of pilot projects and summary of key project deliverables are shown in Annex 1 and Annex 2.

The overall rating of the attainment of objectives is *Satisfactory*.

Highly Satisfactory	Satisfactory	Moderately Satisfactory	Moderately Unsatisfactory	Unsatisfactory	Highly Unsatisfactory
	S				

Rating of the project outcome *relevance* is *Highly Satisfactory*.

Achieved project results are fully in line with national policy priorities, namely the Urban Heating Strategy, but also with European Neighborhood Policy and Action Plan.

Rating of the project outcome *effectiveness* is *Satisfactory*.

The project has delivered good quality results in all project components except for the project component 1 – Strengthening capacities of housing condominiums. Activities in this component have been suspended based on recommendation of the MTE. The key reason was the fact that private heat suppliers preferred to conclude heat delivery contracts directly with apartment owners as more credible clients.

Rating of the project outcome *efficiency* is *Satisfactory*.

Project results have been delivered in a cost-effective way. The project implementation has been delayed and took in total 8 years compared to originally planned 4-year period. However, the delay did not have any negative impact on total project costs.

4.3.2 Cost-effectiveness of Pilot Projects

The total costs of 24 implemented pilot projects are 11.865 mil USD, of which the project contribution was 0.902 mil USD, i.e. 7.6% of total costs on average.

The share of project co-financing ranges between 0.5% of total project costs (cogeneration project in Yerevan State Medical University) up to 100% financing (reconstruction of the boiler house and heating networks in Gyumri, solar collectors in the child care facility in Kapan, solar collectors in cooperative kitchen in Lusadzor village in Tavush marz, solar collectors in Goris Medical Center, and infrared heating in Arabkir Youth Center in Yerevan).

The far largest pilot project is the Avan district heating with cogeneration in Yerevan. Total costs of the project are 9.148 mil USD, of which the private investor financed 9 mil USD and the project provided 0.148 mil USD co-financing, i.e. 1.6% of total costs.

Total lifetime GHG emission savings from 20 pilot projects in operation are 246 519 ton CO₂.

The operation of three pilot projects has been stopped. One of the pilot projects does not have yet monitored GHG emission reductions.

Lifetime GHG emission reductions from replicated projects (installations supported by the UNDP/GEF project and financed by other donors) are 639 100 ton CO₂. Total lifetime GHG emission reductions from both pilot and replicated projects are 885 600 ton CO₂.

Total costs of GHG emission reduction from pilot projects are 48 USD/ton CO₂ including all projects' costs.

In case only costs of projects in operation are taken into account, emission reduction costs are 43 USD/ton CO₂.

The GHG emission reduction costs to GEF (GEF contribution per ton of lifetime CO₂ reductions) are 3.66 USD/tCO₂ including contribution to all pilot projects (2.41 USD/tCO₂ in case only contributions to projects in operation are taken into account).

In both cases these are lower emission reduction costs for GEF than what was originally estimated in the Project Document (4.2 USD/tCO₂).

The actual cost-effectiveness for GEF of GHG emission reductions from pilot projects is rated ***Highly Satisfactory***.

Highly Satisfactory	Satisfactory	Moderately Satisfactory	Moderately Unsatisfactory	Unsatisfactory	Highly Unsatisfactory
HS					

4.3.3 Project Impact

Project results achieved by the project implementation, namely pilot projects that reconstructed district heating schemes based on cogeneration in residential multiapartment buildings, introduced billing based on metered heat and hot water consumption at individual apartment level, and developed and adopted legislation and technical standards, do serve as an example for other investors. Project results have demonstrated feasibility of district heating reconstruction based on co-generation for investors, affordable price of district heating solutions for apartment owners, and restored trust in good quality services of district heating solutions.

The critical element in this success story was adoption of preferential feed-in-tariffs for electricity produced in cogeneration and sold to the national grid. The project 2006 study concludes that “*in terms of the existing and forecasted prices of natural gas, classical district heating schemes based on heat-only boilers are not competitive compared to individual heat supply solutions*” (quoted in: Lessons Learned from the UNDP/GEF Project in Armenia: Improving Energy Efficiency of Municipal Heating and Hot Water Supply, Yerevan, 2012).

This preferential feed-in-tariff regulation was suspended by the PSRC in 2010.

Without preferential feed-in-tariffs in place DH reconstruction projects would not be attractive enough for commercial investors and the replication rate of successful pilot projects and thus the long term project impact would be very limited. One can assume that perhaps some small scale DH schemes in residential sector might be replicated in the future with investment support from different international

programs, but in current economic conditions on a very limited scale. And hardly if at all one can assume replication purely on a commercial basis without subsidies.

This is unfortunately evident also from closing from operation three pilot projects (of which one with cogeneration).

The project has provided arguments and analytical studies to the PSRC supporting adoption and keeping in place preferential FITs. However the decision is not purely technical but political one, and it is a sole responsibility of the government. Currently, there are no concrete governmental plans to reintroduce the preferential FITs again. The PSRC is expected to wait until full completion of the Avan project before further decision.

Rating of the project impact is thus ***Moderately Unsatisfactory***.

Highly Satisfactory	Satisfactory	Moderately Satisfactory	Moderately Unsatisfactory	Unsatisfactory	Highly Unsatisfactory
			MU		

4.3.4 Prospects of Sustainability

The key project intervention to restore building level and district heating solutions for multiapartment buildings has a limited sustainability – because of limited replication potential. The main reason is that the PSRC has cancelled the preferential FITs for cogeneration. FITs are an important source of revenues for investors that help them to recover their investment. There is no institutional set up established by the project that will be in place after project termination that would promote district heating and/or co-generation solutions after project termination except for the foreign private investor of Avan project and local experts.

During project implementation period the unsustainable apartment level heating solutions based on firewood and rather costly and more emission intensive electrical heating have been reduced (use of firewood practically eliminated) and replaced most often with individual apartment level natural gas heaters or boilers.

The heating alternative based on individual apartment level gas heating is not necessarily unsustainable both in economic and environmental terms, if energy efficient gas heaters/boilers are installed and gas installation is implemented and operated in accordance with safety requirements. District or building level heating in comparison with individual apartment heating solutions has a *potential* to accommodate co-generation and/or solar panels for (hot water) heating if economically viable and thus to reduce additional emissions. However district heating based on heat-only boilers is not necessarily less GHG emission intensive.

The difficulty of district heating solutions illustrates the fact that operation of three residential centralized heating pilot projects has been stopped and apartment owners had to use their individual heating solutions (Sevan district heating project has been cancelled before putting into operation, Gyumri, and Yerevan - Khanjyan street projects have been stopped within few years after reconstruction).

Other project interventions, such as energy efficiency improvements of buildings, installation of missing entrance doors, replacement of broken windows, demonstration of infra-red heating

technology, introduction of consumption based billing, have a good prospects and likelihood to be replicated and to deliver benefits after project termination. For example a company that installed infra-red heaters in the pilot project (with 100% financing from the project budget) has already expanded its business and has implemented several infra-red solutions on a commercial basis.

Evaluation of sustainability of potential replication of pilot projects:

Sustainability, i.e. continued operation of already implemented pilot projects, is rated **Likely**.

Likelihood of sustainability of project outcomes (namely benefits from replication of pilot projects in reconstructing district heating schemes) based on evaluation of:

Financial risks – is rated **Moderately Unlikely** due to canceled preferential FITs and insufficient feasibility under current economic conditions. Only the Avan project has a special agreement with PSRC on the preferential FITs and is expected to be extended and to supply 218 buildings as originally planned.

Socio-political risks – is rated **Moderately Unlikely** due to lack of political will to adopt preferential FIT for electricity from cogeneration.

Institutional framework and governance risks – is rated **Moderately Unlikely** due to absence of policies promoting co-generation. On the other hand local experts have a good technical know-how and expertise, although they are not formally institutionalized.

Environmental risks – is rated **Likely**. There are no environmental risks to project results sustainability.

In newly built multiapartment buildings two-part heat tariffs and payment based on metered heat consumption is typically used for building level heating systems.

Prospects of sustainability are rated **Moderately Unlikely**.

Likely	Moderately Likely	Moderately Unlikely	Unlikely
		MU	

4.3.5 Contribution to upgrading skills of the national staff

The project has been implemented by local experts who received only limited guidance and assistance from international experts. In total 33 national experts have been directly hired for project implementation over the duration of project implementation period. Project has implemented series of trainings, seminars and information outreach activities targeted at local professional community, and decision makers.

Contribution to upgrading skills of the national staff is rated **Satisfactory**.

Highly Satisfactory	Satisfactory	Moderately Satisfactory	Moderately Unsatisfactory	Unsatisfactory	Highly Unsatisfactory
	S				

5. Recommendations

- Project logframe indicators and targets should be defined for all project outcomes and at least for all critical project outputs as specified in the Project Document.
- If properly defined project indicators and targets should not be changed over the project implementation period unless the project objectives or outputs are changed.
- Project logframe indicators and targets can and should be supplemented with more detailed indicators and targets for each of the project activity. These detailed activity indicators and targets are then subject to quarterly and annual evaluation by the project manager and the project steering committee.
- Activity targets should be time-bound (and SMART) as well as logframe targets and indicators. That means that detailed targets for specific activity can be defined individually for different time periods (different target for the 1st Q of Year 2 and for the 2nd quarter of Year 3 for example) – if the implementation period of that specific activity is longer than a project management evaluation period (typically one year).
- If adaptive management is implemented and individual project activities are changed, the relevant activity indicators and targets should be then changed accordingly as well.

6. Lessons Learned

- Condominiums played an important role in successful project implementation in multiapartment buildings. Although they were not contracting parties in piloted heat services, their role was local information dissemination and rising interest of apartment owners. Pro-active leadership of condominium representatives was critical success factor.
- Condominiums turned out not to be suitable contracting partners for heat suppliers because of large share of low-income households and unoccupied apartments in typical multiapartment buildings. Heat suppliers preferred to conclude heat supply contracts directly with apartment owners. Typically not all apartment owners opted in pilot projects for the centralized heating solutions.
- New restoration of building level and DH systems based on heat only boilers is typically not sufficiently competitive with already existing individual natural gas apartment level solutions (especially when sunk costs of installed individual gas heaters/boilers are taken into account).
- Technical parameters, such as heat demand density is not a sufficient indicator for DH feasibility, especially in case of low-income households and unoccupied apartments, if there is no state subsidy scheme in place.
- Building level and DH schemes based on heat-only boilers do not have significant environmental benefits compared to individual natural gas heating solutions if safety regulations on exhaust gases on a building level are in place.
- However, in contrast to individual apartment heating solutions, building level and especially DH schemes do have a *technical potential* to accommodate co-generation and solar panels that could reduce emissions.
- Financial feasibility of such emission reducing technologies (solar heating, co-generation) depends on sufficiently high price of natural gas, and sufficiently high electricity to natural gas price ratio.
- If the price of energy and the electricity to natural gas price ratio is not sufficiently high, investment in DH with cogeneration and solar panels is not financially feasible without subsidies.
- Electricity pricing based on long-term marginal costs have a good economic sense supported by economic theory, however electricity is usually priced at average production costs, especially in case of overcapacity in the system.
- Preferential FITs are popular policy tool supporting investment in small scale and effective cogeneration. However, especially in case of overcapacity they do increase the total costs of electricity production in the system that is paid by all customers, including low-income households. Limits on the level and scope of implemented FITs are a viable protection against excessive electricity system costs increase.

- In current Armenian conditions investment to renovation of DH and building level schemes with cogeneration is not attractive enough for investors without preferential FITs in place (or other governmental support scheme).
- Without a clear state policy supporting restoration of building level heating solutions and/or district heating (with) co-generation (subsidies, preferential FITs, ...) renovation of building level and district heating solutions is not feasible and replication of successful pilot DH projects will be minimal.
- The pilot project in Avan proved that if the FITs are in place a strong investor can finance and implement affordable and competitive district heating for multiapartment buildings.
- Billing of heating services based on metered actual consumption of individual apartments proved to be a viable solution that reduces the risk of non-payment and motivates end-users to use energy in an efficient way.
- Billing based on metered individual heat and hot water consumption became a standard also in newly built buildings with building level heating source.
- Strong leadership and pro-active project management is critical for successful project implementation. Without strong personality and professional expertise of the Project Manager, as well as of project team experts, the project could not have been implemented successfully.
- The project benefitted also from assistance of international short-term advisors who provided advice both on project management (revision of project logframe matrix) and technical expertise (feasibility study of the Avan pilot project for example).

7. Annexes

Annex 1: Summary of pilot projects

Co-generation projects

1. Yerevan, Avan district - “ArmRosCogeneration” district heating: 2 MW_{el} Caterpillar cogeneration engine, 7.56 MW_{th} heat only boiler, 300 apartments supplied (40%) in 30 buildings and a kindergarten, individual apartment level heat and hot water meters. Total investment: 9.148 mil USD, of which GEF/UNDP project co-financing 1.6% (feasibility study, investment facilitation, FIT negotiation, 331 heat meters and 310 hot water meters). Project in operation. Connection rate is expected to increase to 70% in the fall. Second phase is planned to be constructed and to supply heat to 218 buildings (and second cogeneration unit and heat boiler to be installed).
2. Yerevan - expansion of the Energy center of Yerevan State Medical University: Installed capacity of the cogeneration unit 2x2 MW_{el} and 2x2.18 MW_{th} was utilized by 40% for heating and cooling. The Project has developed feasibility study on connecting additional university buildings to increase the utilization factor. Total investment of the expansion: 0.573 mil USD, of which GEF project 0.5%. Project in operation.
3. Sevan - district heating with co-generation: The project has assisted the investor to find suitable location for the investment and has developed feasibility study. Total investment: 0.982 mil USD, of which GEF project 8.4%. Operation of this project has been suspended (due to cancellation of preferential feed in tariffs and economic crisis).

Small-scale district heating based on heat-only boilers

4. Gyumri - reconstruction of the boiler house and distribution networks for 4 residential buildings. Total investment: 97 thousand USD, GEF co-financing 100%. The project was in operation for 1 year only and then disconnected.
5. Aparan – installation of windows and doors in a corridor of multiapartment buildings, reconstruction of the gas supply network. Total investment: 42.7 thousand USD, GEF co-financing 91%. Project in operation.
6. Aparan – provision of metering and regulating equipment in DH supplying residential buildings. Total investment costs: 12.5 thousand USD, GEF contribution 82%. Project in operation.
7. Spitak - putting into operation heat supply system of residential buildings, reconstruction of the boiler house, heating networks, provision of metering and regulating equipment. Total investment costs: 110 thousand USD, GEF contribution 89%. Project in operation.
8. Spitak - reconstruction of the boiler house, installation of two new heat-only boilers Uncal-500 kW, provision of the auxiliary equipment, reconstruction of the 110 m of gas pipelines, metering equipment. Investment costs: 82 thousand USD, GEF contribution 84%. Save the

Children contribution for the whole project: 240 000 USD, GEF share on total project costs 21%. Project in operation.

9. Yerevan, Boarding school No.1 - reconstruction of the boiler house, installation of two heat-only boilers Uncal-420 kW, provision of the auxiliary and metering equipment. Total investment costs: 195 thousand USD, GEF contribution 21%. Project in operation.
10. Yerevan, Narcological clinic - reconstruction of the boiler house, installation of two new heat-only boilers Uncal-290 kW, provision of the auxiliary equipment, expansion vessel, metering equipment. Total investment costs: 36 thousand USD, GEF contribution 96.5%. Project in operation.

Solar hot water collectors

11. Yerevan, Avetisyan Str. – installation of solar collectors 78 m², 100 kW heat exchanger, auxiliary equipment and metering for two residential buildings. Total investment costs: 40 thousand USD, GEF contribution 75%. Project in operation.
12. Yerevan, Khanjyan Str. - installation of solar collectors 64 m², 1000 l hot water tank, auxiliary equipment and metering for two residential buildings. Total investment costs: 46 thousand USD, GEF contribution 65%. Project was in operation for 2 years than it was closed due to disconnection of clients (high costs of heating). Solar panels have been used in other projects.
13. Sevan, seminary - installation of solar collectors 24 m², 1000 l hot water tank, auxiliary equipment in a seminary facility. Total investment costs: 60 thousand USD, GEF contribution 94%. Project is in operation.
14. Yerevan, Boarding school No. 2 - Solar collectors 24 m², 1000 l hot water tank, auxiliary equipment. Total investment costs: 13 thousand USD, GEF contribution 95%. Project is in operation.
15. Kajaran, Kindergarten - Solar collectors 16 m², 700 l hot water tank, auxiliary equipment, replacement of windows and entrance doors. Total investment costs: 72 thousand USD, GEF contribution 28%. Project is in operation.
16. Kapan, Child care institution - Solar collectors 24 m², 1000 l hot water tank, auxiliary equipment. Total investment costs: 16 thousand USD, GEF contribution 100%. Project is in operation.
17. Lusadzor, Cooperative kitchen - Solar collectors 12 m², 500 l hot water tank, auxiliary equipment. Total investment costs: 8 thousand USD, GEF contribution 100%. Project is in operation.
18. Voskehat, Kindergarten - Solar collectors 9 m², 500 l hot water tank, auxiliary equipment. Total investment costs: 6 thousand USD, GEF contribution 94%. Project is in operation.
19. Goris, Medical Center - Solar collectors 32 m², 1 500 l hot water tank, auxiliary equipment. Total investment costs: 16 thousand USD, GEF contribution 100%. Project is in operation.
20. Meghri, Medical Center - Solar collectors 30 m², 1 500 l hot water tank, auxiliary equipment. Total investment costs: 16 thousand USD, GEF contribution 92%. Project is in operation.

21. Yerevan, Boarding School No1. - Solar collectors 30 m², 1 300 l hot water tank, auxiliary equipment. Total investment costs: 19 thousand USD, GEF contribution 97%. Project is in operation.

Energy efficient heating technologies

22. Yerevan, Arabkir Youth Center hall – Installation of electricity infrared heaters with a total capacity of 40 kW. Total investment costs: 12 thousand USD, GEF contribution 100%. Project is in operation.
23. Yerevan, ZOO – Space heating and ventilation of cages, installation of 24 kW boiler, 60 aluminum convectors, auxiliary equipment, two ventilators 2x17 kW, metal-plastic pipes. Total investment costs: 6.5 thousand USD, GEF contribution 71%. Project is in operation.
24. Yerevan, Ayb high school – Installation of two Climaventa heat pumps 2x187 kW for space heating and cooling. Total investment costs: 245 thousand USD, GEF contribution 15%. Project is in operation.

Total costs of 24 pilot projects are 11.864 mil USD, of which GEF co-financing is 0.9 mil USD, i.e. 7.6%.

Three out of 24 pilot projects suspended its operation due to cancelation of preferential feed in tariffs, and disconnecting of consumers from small-scale district heating due to high costs.

Annex 2: Summary of key project deliverables, reports and studies

Analytical studies

1. Annual Analytical Reports on the Project's Activities (2005, 2006, 2008, 2009, 2010, 2011, about 90 pages on average)
2. Lessons Learned: Final Report on the Project's Achievements (2012, about 60 pages)
3. Feasibility Study on Restoring the Heat and Hot Water Supply for the Davidashen and the Avan Areas in Yerevan, Armenia by Rambøll company, Denmark (2006)
4. GHG emissions baseline study for introduction of cogeneration system in reconstructed district heating system of Avan and Davitashen districts in Yerevan city (2006)
5. Several reports on institutional issues and on resident surveys performed by National Association of Condominium Owners (since 2006)
6. Software for Heat Supply Small Systems Calculation (2007)
7. Direct measurements, monitoring and assessment of urban air quality in Yerevan and Gyumri cities in 2006-2007 heating season (2007)
8. Reports on capacity building for cost-effective development and implementation of domestic gas appliances energy efficiency labeling program in Armenia (since 2007, procedure adopted in 2011)
9. Legal issues in the process of rehabilitation of centralized heating systems and approaches to their solution (2008)
10. Building Energy Audit and Passport Application Options for Armenia and energy passport exemplary form (2008)
11. Cogeneration coefficient impact on economic indicators of combined energy generation (article, 2008)
12. On the Issue of Fundamental Revision of Natural Gas Pricing and Tariffs Setting Principles in the Republic of Armenia (analytical note, 2008)
13. Reports on monitoring the operating centralized heat supply systems of Avan district in Yerevan, RA (2008-2009)
14. Capacity building and market development for thermo-technical adjustment services for boiler houses, which supply heat to public and residential buildings in Armenia (2009-2010)
15. Development of Methodology for calculation of emissions from solid, liquid and gaseous fuel fired boiler houses with up to 5.8MW installed capacity (2010)
16. Capacity building for implementation of technical energy audit and commercialization of energy efficiency enhancement services proposed as a result of the audit in operating large-size boiler plants in Armenia (2010)
17. Energy Conservation Preliminary Assessments for a number of Armenian towns (2010)
18. Assessment of Heat Supply in Multi-Apartment Blocks in Armenia Analytic Report on Sample Household Survey (2500 respondent households, 2010)
19. Translation and adaptation of an array of EU and ISO standards to Armenian setting (2009, 2010, 2011)
20. Revised norm on Climatology of Construction (2011)

Educational materials

21. "Renewable energy: Sources and Technologies" manuscript (tutorial, 282 pages, 2012)
22. "Arrangement of thermal-technical testing and energy efficiency assessment of gas based boilers" methodological guidance (manual, 2012)

Awareness raising materials

23. Domestic energy consumer guidance on energy labeling and Leaflet on energy labeling (2009)
24. Manual for operation of infrared heating system in Youth Palace of Arabkir district of Yerevan city (2011)

25. Information Leaflet for residents of pilot buildings in Aparan town (2010)
26. Several TV appearances of project experts, management, stakeholders and counterparts illuminating on energy efficiency and energy cogeneration.
27. Multiple factsheets on pilot projects and press-releases on events and successes.

Annex 3: Original Project Document LogFrame with revisions from the Inception Report and Project Revision

Project Goal, Objectives and Outputs	Indicators	Targets
<p>Development Goal: To lay the institutional and financial foundation for and to remove other key barriers to the sustainable development of the heat and hot water supply services in Armenia, thereby reducing their GHG emissions and improving their quality and affordability to the customers.</p>	<p>The specific GHG emissions of heating and hot water supply per unit of heat and hot water delivered show a decreasing trend.</p> <p>The number of condominiums initiating collective measures to improve their heat and hot water supply is increasing.</p> <p>The centralized DH companies are adopting measures to encourage the commercial operation of the companies and the improvement of their energy efficiency, including the introduction of consumption based metering and billing.</p> <p>An increasing number of private, decentralized service providers will make contracts with the buildings to supply them with heat and/or hot water, thereby replacing the extensive use of wood fuel and electricity with environmentally more sustainable alternatives (such as small gas boilers and mini-DH networks).</p> <p>At least USD 10 million worth of additional investments made for improving the energy efficiency of the existing DH systems and/or for promoting other energy efficient alternatives for the current use of electricity and fuel wood for heating purposes</p>	
<p>Immediate Objective 1 Strengthening the role of the condominiums or other forms of consumer associations in organizing and managing the heat and hot water supply services collectively at the</p>	<p>Signed contracts, within the condominium as well as between the service providers and condominiums for the provision of heat and hot water supply services.</p>	

building level.		
Output 1.1 Improved legal and regulatory framework to strengthen the role of the condominiums and to allow them to present themselves as credible, legally and financially responsible counterparts for the commercial service providers	Recommendations for the legal and regulatory changes to strengthen the role of the condominiums in organizing and procuring heat and hot water supply services finalized and discussed with the relevant Government counterparts and, as applicable, adopted.	Recommendations for the legal and regulatory changes adopted by the end of the Year 3.
Output 1.2 Strengthened capacity of the condominiums to manage their operations and to organize the heat and hot water supply services collectively at the building level	Condominiums effectively managing their operations, including the organization of the heat and hot water supply	Several condominiums or other forms of consumer associations are expressing interest in getting organized for the purpose of organizing heat and hot water supply services for their tenants, they are effectively managing this process and are receiving prompt technical, legal and other support through the project activities, as needed.
Immediate Objective 2: Supporting the restructuring process and building the capacity of the existing DH companies to improve the efficiency of their operations.	Enhanced capacity of the existing DH companies to manage their operations and to leverage financing for the investments needed.	
Output 2.1 Implementation strategy to improve the energy efficiency of the existing DH companies and to facilitate their gradual restructuring and commercialization.	Implementation strategy finalized and, as applicable, adopted.	The implementation strategy adopted by the Government and the Municipality/DH company concerned by the end of the Year 3.
Output 2.2 Improved legal and regulatory frameworks to encourage and support the improved energy efficiency of the existing DH services and the commercial operation of the remaining DH companies.	Recommendations for the legal and regulatory changes to support the targeted EE investments finalized and discussed with the relevant Government counterparts and, as applicable, adopted.	Recommendations for the legal and regulatory changes adopted by the end of the Year 3.
Output 2.3 Developing and commissioning of a consumption metering and billing system	A consumption based metering and billing system developed and introduced in the frame of selected pilot/demonstration projects	Consumption based metering and billing system taken into regular use by the remaining DH companies by the end of the project.
Output 2.4 Strengthened capacity of the management and the operating personnel of the DH companies to improve the efficiency of their operations.	Enhanced capacity of the management and the operation personnel of the companies to improve the efficiency of their operations and leverage financing for the investments needed	By the end of the Year 2, the management and the operation personnel of the companies are actively and effectively involved in restructuring the companies, in improving the efficiency of their operations and in leveraging financing for the

		investments needed based on the state of the art approaches and market mechanisms.
Immediate Objective 3: Supporting the emerging new service providers in offering their services to the condominiums and structuring financing for the investments needed	Contracts for heat supply concluded between the new service providers and the clients.	
Output 3.1 Improved legal and regulatory framework to encourage the new, decentralized service providers to enter the heat and hot water supply market based on the use of mini DH grids or gas fired building boilers in the areas that can currently not served by or are otherwise not viable for centralized DH services	Recommendations for the legal and regulatory changes to encourage the new, decentralized service providers to enter the heat and hot water supply market finalized and discussed with the relevant Government counterparts and, as applicable, adopted.	Recommendations for the legal and regulatory changes adopted by the end of the Year 3.
Output 3.2 Strengthened capacity of the emerging, new service providers to develop “bankable” investment proposals, to structure financing for the projects and, as needed, to manage the commercially sustainable operation of the companies otherwise.	Investment proposals prepared and financed Projects worth of at least USD 5 million under implementation. Commercial sustainability of at least 5 companies established	Strengthened capacity of the emerging, new service providers to develop “bankable” investment proposals, to structure financing for the projects and, as needed, to manage the commercially sustainable operation of the companies otherwise.
Output 3.3 A certification system for qualified service and equipment providers.	The certification system developed and adopted.	The certification system adopted, established and in operation by the end of the project.
Immediate Objective 4 Utilizing the results, experiences and lessons learnt for advancing the sustainable development of the heat and hot water services in Arrmenia with a specific emphasis on the GHG reduction aspects.	Final project report documenting the results, experiences and lessons learned. Expressions of interests to replicate the project activities at the national and regional level.	
Output 4.1 A system for monitoring the GHG emission reductions of the proposed pilot/demonstration projects and assessment of GHG removal as a result of the avoided deforestation.	The GHG emission monitoring protocol developed The operating personnel of the projects trained for compiling the information needed The GHG emission removal as a result of the avoided deforestation assessed	Report presenting the verified GHG emission reductions achieved finalized by the end of the project.

Output 4.2 Norms and enforce mechanisms for preventing the unsustainable use of forest resources as wood fuel.	Norms for defining the amounts of sustainable use of forest wood developed and adopted. The possible enforcement mechanisms evaluated, developed and adopted.	The proposed norms and enforce mechanisms adopted by the Government by the end of the project.
Output 4.3 Compilations, evaluations and analyses of experiences and lessons learned under the project.	Finalized project monitoring and evaluation reports.	Project's final report adopted by the Government and UNDP by the end of the project.
Output 4.4 Project results, experiences and lessons learned disseminated at the national and regional level.	Workshops and other public outreach activities organised at the national and regional level to discuss and disseminate the project results, conclusions and recommendations.	(a) The final project report translated in Armenian/English and Russian and the draft translation made available for review at least two months before the end of the project. (b) The final report distributed to key institutions both within Armenia and abroad by the end of the project. (c) Workshops and other public outreach activities organised at the national and regional level to discuss and disseminate the project results, conclusions and recommendations by the end of the project.

Annex 4: Revised LogFrame with revisions from the Inception Report and Project Implementation

Project Goal and Outcomes	Indicators	Targets
Development Goal: To lay the institutional and financial foundation for and to remove other key barriers to the sustainable development of the heat and hot water supply services in Armenia, thereby reducing their GHG emissions and improving their quality and affordability to the customers.	Amount of investments leveraged for restoring the heat and hot water supply services on the basis of energy efficient central water heating systems, including the possibility for increasing use of co-generated electricity and heat	At least USD 10 million worth of additional investments leveraged by the project for sustainable heat and hot water supply systems
	Amount of cumulative GHG reduction by the end of the project compared to the set baseline	0.7 mil tons of CO2 reduced as a direct impact of the project (lifetime)
Outcome 1: Strengthened capacity of the condominiums or other forms of consumer associations to manage their operations and to organize the heat and hot water supply services collectively at the building level	Number of signed contracts within the condominium as well as between the service providers and condominiums for the provision of heat and hot water supply services	80 new contracts
Outcome 2: The capacity of the local municipalities built to develop and implement sustainable heat and hot water supply plans and to manage the remaining assets of the former district heating systems	The number of districts/cities, which have developed and adopted a sustainable heat and hot water supply plan	10
	The number of concrete investment projects for the restoration of the heat and hot water supply services being developed.	10
	Number of citizens having access to restored central	2400 citizens

	water heating and hot water supply services	
Outcome 3: Strengthened capacity of the new energy service providers in offering their services to the condominiums and structuring financing for the investments needed	Contracts for heat supply concluded between new service providers and clients	20
Outcome 4: The results, experiences and lessons learnt documented and effectively disseminated	Final project report documenting the results, experiences and lessons learned published and distributed	1 final report
	Expressions of interests to replicate the project activities at the national and regional level	10 expressions of interest

Annex 5: Final evaluation TOR



Empowered lives.
Resilient nations.

UNDP/GEF “ARMENIA-IMPROVING THE ENERGY EFFICIENCY OF MUNICIPAL HEATING AND HOT WATER SUPPLY” PROJECT, PIMS1273

TERMS OF REFERENCE FOR TERMINAL EVALUATION

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8.

Position:	International Consultant on Independent Terminal Evaluation
Project number and name:	“Armenia-Improving the Energy Efficiency of Municipal Heating and Hot Water Supply” UNDP/GEF/00035799 Project
Type of Contract:	IC
Duty Station:	Home-based and 1 mission to Armenia
Duration:	20 working days

The Government of the Republic of Armenia and UNDP implement a GEF funded full size project titled “Armenia – Improving the Energy Efficiency of Municipal Heating and Hot Water Supply”.

The objective of the project is to reduce greenhouse gas (GHG) emissions resulting from the heat and hot water supply practices in Armenian cities and to lay the foundation for the sustainable development of heat and hot water supply services in these cities by overcoming market barriers.

The implementation of the project was started in 2005 and has to be commenced in 2012. UNDP is a GEF implementing agency for the project. The project is executed by the Ministry of Nature Protection of the Republic of Armenia.

9.

1. INTRODUCTION

1.1. 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*
- iv) 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, PIRs – or as specific time-bound exercise such as mid-term reviews, audit reports and final evaluations.

The evaluation is to be undertaken in accordance with the “GEF Monitoring and Evaluation Policy” (see <http://www.thegef.org/gef/node/4184>) and “Guidelines for GEF Agencies in Conducting Terminal Evaluations” (see <http://www.thegef.org/gef/taxonomy/term/81>).

Terminal 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.

1.2. The project objectives and its context

The objective of the “Armenia – Improving the Energy Efficiency of Municipal Heating and Hot Water Supply” full-size project according to the Project Document is to “reduce the greenhouse gas (GHG) emissions resulting from the current heat and hot water supply practices in Armenian cities by laying the foundation for the sustainable development of heat and hot water supply services in these cities while taking into account global environmental impacts”. The following key barriers were identified as hampering the sustainable development of the heat and hot water supply sector in Armenia and should be addressed by the project:

- A weak institutional, legal and regulatory framework that does not allow or encourage the existing municipal district heating (DH) companies to develop their heat and hot water supply services on a commercial basis and to open the market for private investors and new service providers;
- Lack of capacity, incentives and concrete implementation plans for restructuring and commercialization / privatization of the existing DH companies so as to improve the efficiency of their operations and to leverage financing for the priority investments needed, including the introduction of a consumption based metering and billing system and new alternative systems and technologies for DH and hot water supply;
- Lack of tradition, experience and capacity of apartment owners to organize and improve the efficiency and quality of the heat and hot water supply services collectively at the building level; and,
- The lack of capacity and experience of the emerging new service providers to develop “bankable” investment proposals, to structure financing for the projects and, as needed, to manage the commercially sustainable operation of the companies otherwise. They also do not possess any knowledge of new alternative decentralized energy efficient heating and hot water supply systems.

To reach the objective and to overcome these barriers the UNDP/GEF project was designed with four main project components:

- strengthening the role of condominiums in collectively organizing and managing heat and hot water supply services at the building level (Component 1);
- support restructuring and capacity building of the existing district companies to improve both their service quality and operational efficiency (Component 2);
- support the new decentralized service providers to commercially run and market their businesses, and to structure financing for the required investments in areas that do not sustain the centralized district heating services (Component 3); and,
- use the results, experiences and lessons learned for advancing the sustainable development of the heat and hot water services in Armenia with a specific emphasis on the GHG emission reduction aspects (Component 4).

The proposed capacity building and other technical assistance activities were envisaged to be complemented and implemented in close co-operation with the activities of the other donors including the World Bank/IDA funded Urban Heating Project, the Government of Netherlands funded Industrial District Heating Development and the others.

From the point of view of the design and implementation of the project, the key stakeholders are / were:

- Ministry of Nature Protection (Project Executing Agency and UNFCCC Focal Point).
- Ministry of Economy as the responsible agency for implementation of the Heating Strategy of RA.
- Ministry of Energy for promotion of energy saving, energy efficiency and renewable energy development
- Ministry of Territorial Administration and Regional Governors’ Offices (Yerevan City Municipality) for developing and implementing pilot projects.
- Ministry of Urban Development as responsible agency for adoption of standards and norms.
- Public Services Regulatory Commission.

The Project Document was signed between the Ministry of Nature Protection and UNDP Country Office on 21 of January 2005.

The project implementation was envisaged for four years. Total budget of the project is US\$ 2,950,000.

The mid-term evaluation of the project was conducted in June 2008 (see http://www.nature-ic.am/res/pdfs/documents/Heating/Reports/2008/Mid-term_Evaluation-Report_2008.pdf). The overall rating of mid-term evaluation was satisfactory. It was indicated that the project as a whole was both highly relevant, has generally sound project design, and is being implemented effectively, with most outputs rated as satisfactory in terms of effectiveness. The recommendations of the mid-term evaluation include inter alia need for no-cost extension “since the project was at a critical stage because if policy barriers are removed through the project efforts the market could take off in a substantial way. It would be a great pity if the project came to an end in the middle of these developments and the opportunities were lost. Since sufficient budget clearly existed, a “no-cost” extension of at least an additional two years was recommended”.

According to the recommendations, the Project management response and decision of the Project Steering Committee (SC) the Project duration was extended till September 2012 and the multiyear work plan was correspondingly revised.

The project has made a valuable contribution to the introduction of the advanced energy efficient technologies in the heat supply sector of Armenia and particularly the combined heat and power (CHP) generation technology. The project has assisted with development of the legal and normative documentation related to the CHP technologies application for restoration of the collapsed DH systems. The promoted regulatory framework along with feasibility studies on the construction of the cogeneration based heat supply systems developed by the Project contributed to the attraction of the large-scale private (including foreign) investments to the sector and implementation of the large-scale heat supply projects. The project has contributed to the use of the renewable energy sources in heat supply sector and particularly - introduction of solar collectors based hot water supply systems.

A number of such projects along with capacity building activities have been implemented in collaboration with local authorities. The project has contributed to the regulatory framework improvement including development of methodologies, draft Government decisions on energy efficiency regulation, revision and adaption of norms. The project has conducted a large-scale socio-economic survey on the heat supply option preferences and situation in the Republic of Armenia and implemented an awareness raising activity among the residents in different cities of Armenia.

At present, the project reached the final phase, when the progress should be reviewed, the project approach analyzed and lessons learned captured.

2. PURPOSE OF TERMINAL EVALUATION

The terminal evaluation of the UNDP/GEF Project “Armenia – Improving the Energy Efficiency of Municipal Heating and Hot Water Supply” is initiated by UNDP as the GEF Implementing Agency.

The purpose of the terminal evaluation is to provide a comprehensive and systematic account of the performance of the completed project by assessing its design, process of implementation, achievements against project objectives including any agreed changes in the objectives during project implementation and any other results. Terminal evaluations have four complementary purposes to:

- promote accountability and transparency, and to assess and disclose levels of project accomplishments;

- capture the lessons that may help to improve the selection, design and implementation of future GEF activities;
- provide feedback on issues that are recurrent across the portfolio and needs attention, and on improvements regarding previously identified issues;
- contribute to the GEF Evaluation Office databases for aggregation, analysis and reporting on effectiveness of GEF operations in achieving global environmental benefits and on the quality of monitoring and evaluation across the GEF system.

Terminal evaluation should not be used as an appraisal for preparation or as a justification for a follow-up phase of the evaluated project and will serve to:

- Enhance organizational and development learning;
- Enable informed decision making;
- Create the basis for replication of successful project outcomes.

More specifically, the evaluation should assess:

Project concept and design:

The evaluator will assess the project concept and design. He/she will review the problem addressed by the project and the project strategy, accomplishing an assessment of the appropriateness of the objectives, planned outputs, activities and inputs as compared with cost-effective alternatives. The executing modality and managerial arrangements should also be judged. The evaluator will assess the relevance of the indicators and review the work plan, planned duration and budget of the project.

Implementation

The evaluator will assess the implementation of the project in terms of quality and timelines of inputs and efficiency and effectiveness of activities carried out. Also, the effectiveness of management as well as the quality and timelines of monitoring and backstopping by all parties to the project should be evaluated. In particular the evaluation is to assess the Project team’s use of adaptive management in project implementation.

Project outputs, outcomes and impact

The evaluation will assess the outputs, outcomes and impact achieved by the project as well as the sustainability of project results. This should encompass an assessment of the achievement of the immediate objectives and the contribution to attaining the overall objective of the project. The evaluation should also assess the extent to which the implementation of the project has been inclusive of relevant stakeholders and to which it has been able to create collaboration between different parties. The evaluation will also examine if the project has had significant unexpected effects, whether of beneficial or detrimental character.

The main stakeholders of the evaluation are:

- UNDP/GEF Regional Coordinating Unit
- UNDP Armenia
- Ministry of Nature Protection.

3. PRODUCTS EXPECTED FROM THE EVALUATION

The key product expected from the final evaluation is a comprehensive analytical report in English.

The Evaluation Report will present recommendations and lessons of broader applicability for follow-up and future support of UNDP and/or the Government, highlighting the best and worst practices in addressing issues relating to the evaluation scope. It aims to emphasize any gaps remaining after the project implementation to be addressed in further initiatives by the Government to secure sustainable development of the heat supply market in Armenia.

The length of the Report should not exceed 50 pages in total.

The first draft of the Evaluation report should be submitted to UNDP Armenia within two weeks of completion of the in-country part of the mission.

Prior to approval of the final evaluation report, a draft version shall be circulated for comments to the government counterparts, project management, UNDP Country Office (CO) and UNDP/GEF Regional Technical Advisor for Climate Change for Europe and CIS.

UNDP Armenia and the stakeholders will submit comments and suggestions within 5 working days after receiving the draft. If there are discrepancies between the impressions and findings of the evaluator and the aforementioned parties these should be explained in an annex attached to the final report.

4. EVALUATION METHODOLOGY

The project will be tested against the following GEF evaluation criteria:

- (i) Relevance – the extent to which the activity is suited to national and sectoral development priorities and organizational policies and to global environmental benefits, including changes over time.
- (ii) Effectiveness – the extent to which the actual project outcomes commensurate with the original or modified project objectives.
- (iii) Efficiency – the extent to which results have been delivered with the least costly resources possible. Was project implementation delayed, and, if it was, did that affect cost-effectiveness.
- (iv) Results/Impacts – the positive and negative, foreseen and unforeseen, changes to and effects produced by a development intervention. In GEF terms, results include direct project outputs, short-to medium term outcomes, and longer-term impact including global environmental benefits, replication effects and other, local effects.
- (v) Sustainability – the likely ability of an intervention to continue to deliver benefits for an extended period of time after completion. Projects need to be environmentally as well as financially and socially sustainable.

The Project will be rated in line with GEF terminal evaluation guidelines

(<http://www.thegef.org/gef/sites/thegef.org/files/documents/Policies-TEguidelines7-31.pdf>) as follows for relevance, effectiveness, efficiency and results:

- a) **Highly Satisfactory (HS):** The project has no shortcomings in the achievement of its objectives.
- b) **Satisfactory (S):** The project has minor shortcomings in the achievement of its objectives.
- c) **Moderately Satisfactory (MS):** The project has moderate shortcomings in the achievement of its objectives.
- d) **Moderately Unsatisfactory (MU):** The project has significant shortcomings in the achievement of its objectives.
- e) **Unsatisfactory (U):** The project has major shortcomings in the achievement of its objectives.
- f) **Highly Unsatisfactory (HU):** The project has severe shortcomings in the achievement of its objectives.

As for sustainability criteria the evaluator should evaluate the “likelihood of sustainability of outcomes at project termination, and provide a rating for this”. Sustainability is understood as the likelihood of continued benefits after the GEF project ends. The following four dimensions or aspects of sustainability should be addressed:

Financial risks:

- a. Are there any financial risks that may jeopardize sustainability of project outcomes?

- b. What is the likelihood of financial and economic resources not being available after the GEF assistance (resources can be from multiple sources, such as the public and private sectors, income generating activities, and trends that may indicate that it is likely that in future there will be adequate financial resources for sustaining project's outcomes)?

Socio-political risks:

- a. Are there any social or political risks that may jeopardize sustainability of project outcomes?
b. What is the risk that the level of stakeholder ownership (including ownership by governments and other key stakeholders) will be insufficient to allow for the project outcomes/benefits to be sustained?
c. Do the various key stakeholders see that it is in their interest that the project benefits continue to flow?
d. Is there sufficient public / stakeholder awareness in support of the long-term objectives of the project?

Institutional framework and governance risks:

- a. Do the legal frameworks, policies and governance structures and processes pose risks that may jeopardize sustenance of project benefits?
b. While assessing this parameter, also consider if the required systems for accountability and transparency, and the required technical know-how are in place.

Environmental risks:

- a. Are there any environmental risks that may jeopardize sustenance of project outcomes? The evaluation should assess whether certain activities will pose a threat to the sustainability of the project outcomes. For example, construction of dam in a protected area could inundate a sizable area and thereby neutralizing the biodiversity related gains made by the project.

Each of the above dimensions of risks to sustainability of the project outcomes will be rated as follows:

- a) **Likely (L):** There are no or negligible risks that affect this dimension of sustainability.
b) **Moderately Likely (ML):** There are moderate risks that affect this dimension of sustainability.
c) **Moderately Unlikely (MU):** There are significant risks that affect this dimension of sustainability
d) **Unlikely (U):** There are severe risks that affect this dimension of sustainability.

All the risk dimensions of sustainability are critical. Therefore, overall rating for sustainability will not be higher than the rating of the dimension with lowest ratings. For example, if a project has an 'Unlikely' rating in either of the dimensions then its overall rating cannot be higher than 'Unlikely'.

The evaluation must provide evidence-based information that is credible, reliable and useful. It must be easily understood by project partners and applicable to the remaining period of project duration.

An annex providing more detailed guidance on terminology and the GEF Project review Criteria is an integral part of this TOR (Annex 1).

The evaluation should provide as much gender disaggregated data as possible.

The Terminal Evaluation will be done through a combination of processes including a desk study, field visits and interviews with main stakeholders and beneficiaries. The evaluator should develop detailed methodology and work plan during the preparatory phase of the final evaluation. The evaluation tools and techniques may include, but not limited to:

- Documentation review (desk study) - the list of documentation to be reviewed is included in the Annex 3 to the Terms of Reference;
- Interviews with major stakeholders including UNDP/GEF project implementing and executing agencies, government representatives, representatives of the final beneficiaries, etc.
- Field visits to the pilot projects sites;
- Questionnaires;
- Participatory techniques and other approaches for the gathering and analysis of data.

5. Detailed Scope of Work

The evaluation will focus on the range of aspects described below. In addition to a descriptive assessment, all criteria marked with ® should be rated using the following divisions: Highly Satisfactory, Satisfactory, Moderately Satisfactory, Moderately Unsatisfactory, Unsatisfactory, Highly Unsatisfactory. All ratings given should be properly substantiated.

5.1 Project Concept/Design

5.1.1. Project strategy/relevance ®: the extent to which the project was suited to national and sectoral development policy and priorities including changes over time as well as the extent to which the project activities contribute towards attainment of global environmental benefits.

- a) How and why project outcomes and strategies contributed to the achievement of the national and sectoral development priorities?
- b) Examine their relevance and whether they represent the best project strategy for achieving the project objectives (in light of updated underlying factors)?
- c) Has the government approved policies or regulatory frameworks been in line with the project's objectives?
- d) Assess the indicators defined for guiding implementation and measurement of achievement

5.1.2 Preparation and readiness

- a) Were the project's objectives and components clear, practicable and feasible within the project timeframe?
- b) Were the capacities of executing institution and counterparts properly considered when the project was designed?
- c) Were lessons from other relevant projects properly incorporated in the project design?
- d) Were the partnership arrangements properly identified and the roles and responsibilities negotiated prior to project approval?
- e) Were counterpart resources (funding, staff, and facilities), enabling legislation, and adequate project management arrangements in place at project entry?

5.1.3 Stakeholder involvement ®

- a) Did the project involve the relevant country representatives from government and civil society through information-sharing, consultation and by seeking their participation in the project's design and implementation?
- b) Did the project consult and make use of the skills, experience and knowledge of the appropriate government entities, NGOs, community groups, private sector, local governments and academic institutions in the design of project activities?

5.1.4 Underlying factors/assumptions

- a) Assess the underlying factors beyond the project's immediate control that influenced outcomes and results. Consider the appropriateness and effectiveness of the project's management strategies for these factors.
- b) Assess the effect of any incorrect assumptions made by the project.

5.1.5 Management arrangements

- a) Were the project roles properly assigned during the project design?
- b) Were the project roles in line with UNDP and GEF program guides?
- c) Consider the linkages between the project and other intervention within the heat supply sector of RA

5.1.6 Project budget and duration

- a) Assess if the project budget and duration were planned in a cost-effective way?

5.1.7 Design of project monitoring and evaluation system

Assess whether or not:

- a) the project had a sound M&E plan to monitor results and track progress toward achieving project objectives
- b) a baseline (including data, methodology, and so on), SMART (specific, measurable, achievable, realistic, and timely) indicators and data analysis systems were included in M&E plan,
- c) the requirements on evaluation studies at specific times to assess results were included in M&E plan,
- d) adequate funding for M&E activities was envisaged at the project planning stage.

5.1.8 Sustainability and Replication Strategies

- a) Assess if project sustainability and replication strategies were developed during the project design? And assess its relevance.

5.2. Project Implementation

5.2.1 Project's Adaptive Management ®

a) Monitoring and Evaluation®

- M&E plan implementation
Assess whether or not:
 - M&E system was in place and facilitated timely tracking of progress towards project's objectives by collecting information on chosen indicators continually through-out the project implementation period;
 - annual project reports are complete, accurate and with well justified ratings;
- the information provided by the M&E system was used to improve project performance and to adapt to changing needs
- whether M&E was funded adequately and in a timely manner during implementation.

The overall rating of M&E during project implementation will be based solely on the quality of M&E plan implementation using: Highly satisfactory, Satisfactory, Moderately Satisfactory, Moderately Unsatisfactory, Unsatisfactory, Highly Unsatisfactory ratings.

- b) Risk Management: The Final Evaluation is to consider the currently evolving policy and economic climate in consideration of the heat supply market development risks because an external factors have greatly influenced the project implementation.

- Validate whether the risks identified in the project document and PIRs were the most important and whether the risk ratings applied were appropriate. If not, explain why.
- Describe any additional risks identified.
- Assess the project's risk identification and management systems.

c) Work Planning

- Assess the use of routinely updated workplans.
- Assess the use of electronic information technologies to support implementation, participation and monitoring, as well as other project activities.
- Was work planning process result-based?

d) Financial management

- Consider the financial management of the project (including reporting and planning, that allowed management to make informed decisions regarding the budget and allowed for timely flow of funds) with specific reference to the cost-effectiveness of interventions. (Cost-effectiveness: the extent to which results have been delivered with the least costly resources possible). Any irregularities must be noted.

- Assess the actual project costs by objectives, outputs, activities. The report will include a table of planned vs. actual project financial disbursements, and planned co-financing vs. actual co-financing in this project, according to the table attached in Annex 2 of this TOR.
- Was there due diligence in the management of funds and financial audits?

e) Reporting

- Assess how adaptive management changes have been reported by the project management
- Assess how lessons derived from the adaptive management process have been documented and shared with key partners.

f) Delays

- Assess if there were delays in project implementation, then what were the reasons?
- Did the delay affect the achievement of the project's outcomes and/or sustainability?

5.2.2 Contribution of Implementing and Executing Agencies:

- a) Assess the role and the contribution to the project by UNDP CO and the project executing agency. Consider:

- Policy advice and dialogue
- Coordination
- Field visits
- Participation in Steering Committee
- Project reviews, PIR preparation and follow-up
- Skill mix
- Operational support

5.2.3 Stakeholder Participation, Partnership Strategy ®

- a) Consider the dissemination of project information to partners and stakeholders
- b) Assess whether or not local stakeholders participated in project management and decision-making. Include an analysis of the strengths and weaknesses of the approach adopted by the project in this area.
- c) Consider 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. Assess the number of companies that applied to the project for receiving technical assistance.
- d) Assess involvement of governmental institutions in project implementation, the extent of governmental support to the project.
- e) Did the project consult and make use of the skills, experience and knowledge of the appropriate government entities, NGOs, community groups, private sector, local governments and academic institutions in the implementation of project activities?

5.2.4 Sustainability: extent to which the benefits of the project will continue, within or outside the project scope, after it has come to an end. To identify risks to the sustainability of the project initiatives the evaluators may look at factors such as establishment of sustainable financial mechanisms, mainstreaming project objectives into the broader development policies and sectoral plans and economies.

5.3 Project Results (Outputs, Outcomes and Impact)

Attainment of Outcomes / Achievement of Objectives® - The extent to which the project's objectives (environmental and development) were achieved. Progress towards results should be based not only on a comparison of indicators at the end of the project with target level but also should consider the extent to which these results will be changed beyond the project time-frame because some pilot projects which were initiated and supported by the project are not completed yet and their lifetime exceeds the project duration. The evaluation will also examine presence of significant unexpected effects both of beneficial or detrimental character which has been caused by the changes in development conditions and how the project contributed to the achievement of these results.

Contribution to upgrading skills of the national staff should also be considered.

6. Indicative Outline of the Terminal Evaluation Report

The key product expected from the final evaluation is a comprehensive analytical report in English that should, at least, include the following contents:

1. **Executive summary** (1-2 pages)

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

2. **Introduction** (3-4 pages)

- Project background
- Purpose of the evaluation
- Key issues to be addressed
- Methodology of the evaluation
- Structure of the evaluation

3. **The Project and its development context** (3-4 pages)

- Project background
- Project start and its duration
- Implementation status
- Problems that the project seeks to address
- Immediate and development objectives of the project
- Main stakeholders
- Results expected
- An analysis of the situation with regard to the outcomes, the outputs and the partnership strategy;

4. **Findings and Conclusions** (including best practice and lessons learned, assessment of performance) (8-10 pages)

- *Project Concept/Design*
 - Project relevance
 - Country ownership/Drivenness
 - Stakeholder participation
 - Replication approach
 - Cost-effectiveness
 - Sustainability
 - UNDP comparative advantage
 - Linkages between project and other interventions within the sector
 - Management arrangements
 - Indicators
- *Project Implementation*
 - Financial management
 - Monitoring and evaluation
 - Stakeholder participation
 - Management by the UNDP country office
 - Coordination and operational issues
 - Execution and implementation modalities
 - Identification and management of risks (adaptive management)
- *Results*
 - Attainment of outputs, outcomes and objectives

- Project Impact
- Contribution to upgrading skills of the national staff

5. Recommendations (2-4 pages)

- 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 (3-4 pages)

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
- 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).

7. Evaluation Principles

The evaluation should follow the major GEF principles for evaluation:

- **Independence**
- **Credibility**
- **Utility**
- **Impartiality**
- **Transparency**
- **Disclosure**
- **Ethical**
- **Partnership**
- **Competencies and Capacities**

The evaluators must be independent from both the policy-making process and the delivery and management of assistance. In particular, they should not personally have been engaged in the activities to be evaluated or have been responsible in the past for the design, implementation, or supervision of the project. Therefore applications will not be considered from evaluators who have had any direct involvement with the design or implementation of the project. This may apply equally to evaluators who are associated with organizations, universities or entities that are, or have been, involved in the delivery of the project.

Any previous association with the project, executing agency - the Ministry of Nature Protection of the Republic of Armenia or other partners/stakeholders must be disclosed in the application. This applies equally to firms submitting proposals as it does to individual evaluators.

If selected, failure to make the above disclosures will be considered just grounds for immediate contract termination, without recompense. In such circumstances, all notes, reports and other documentation produced by the evaluator will be retained by UNDP.

8. EVALUATION PROCESS

The Terminal Evaluation will be carried out by international consultant - expert on areas of international projects' monitoring and evaluation with the focus on climate change, sustainable development, energy sector, particularly heat supply sector.

The consultant is responsible for the successful completion of the evaluation and finalizing the Terminal Evaluation (TE) report.

Duties and Responsibilities:

- Desk review of documents, development of draft detailed methodology and work plan for TE;
- Briefing with UNDP CO, agreement on the methodology, scope and outline of the TE report;
- Interviews with major stakeholders, including UNDP/GEF project implementing and executing agencies, government representatives, partners, etc.;
- Field visits to the selected pilot project sites (Avan project site obligatory) and interviews with pilot projects' administration key staff;
- Debriefing with UNDP and project implementing partners;
- Development and submission of the first draft of TE report. The draft will be shared with the UNDP CO, UNDP/GEF (UNDP/GEF RCU Bratislava) and key project stakeholders for review and commenting;
- Finalization and submission of the final TE report through incorporating suggestions received on the draft report.

Required Qualification:

- Advanced university degree in technical, economics or energy/environment related areas;
- Work experience in relevant areas for at least 8 years, including:
 - familiarity with the common problems and recognized expertise in the field of developing the heat and hot water supply systems and services in the countries with the economies in transition;
 - familiarity with the international best practices and lessons learnt in improving the energy efficiency of the heat and hot water supply and to reduce the related GHG emissions;
 - experience with financial analysis and financing mechanisms implemented for improving the energy efficiency of the residential sector in the countries with economies in transition.
 - recent experience with result-based management evaluation methodologies;
 - recent experience in evaluation of international donor driven projects (project evaluation experiences within United Nations system will be considered an asset);
- Conceptual thinking and analytical skills;
- Excellent English communication skills;
- Knowledge of Armenian and/or Russian language will be considered an asset;
- Computer literacy.

Evaluation Criteria:

IC will be evaluated against combination of technical and financial criteria. Technical evaluation stage encompasses desk review of applications. Experts not meeting any of minimum technical qualification requirements will be automatically excluded from the list of candidates for further technical evaluation.

Maximum obtainable score is 100, out of which the total score for technical criteria equals to 70 points (70%) and for financial criteria 30 (30%). Candidates who pass 70% of maximum obtainable scores of the technical criteria (i.e. $70 \times 70\% = 49$ points) as a result of a desk review of applications will be considered as short-listed candidates.

Contract Type, Duration and Terms of Payment:

The consultant will be hired for maximum 20 days as an Individual Contractor with maximum 13 days of home based work and maximum (or around) 7 days of mission to Armenia. The incumbent will be paid a lump sum. The costs of in-country mission of the consultant are to be included in the lump sum.

Fee payments will be made based on following milestones:

30% - First draft of TE report;

70% - Final TE report

Duty Station:

Home based with one mission to Armenia.

9. IMPEMENTATION ARRANGEMENTS

- Management arrangements - The principal responsibility for managing this evaluation lies with UNDP CO in Armenia. UNDP CO will contract the Evaluator. UNDP and the UNDP's Environmental Governance Portfolio (UNDP EGP) will be responsible for liaising with the project team, to set up the stakeholder interviews, arrange field visits and co-ordinate with the Executing Agency and other counterparts. UNDP Armenia will contract the TE evaluator and ensure the timely provision of per diems and travel arrangements within the country for the evaluation team. These Terms of Reference follow the UNDP/GEF policies and procedures and together with the final agenda are agreed upon by the UNDP/GEF/Regional Coordinating Unit, UNDP CO in Armenia and the Ministry of Nature Protection. These three parties will receive a draft of the terminal evaluation report and provide comments on it prior to its completion.

The report should be submitted to UNDP Country Office in Armenia (to the attention of Mr. Armen Martirosyan: e-mail address: armen.martirosyan@undp.org mailing address: 14 Petros Adamyan Street, Yerevan 0010, Armenia, tel. (374 10) 56 60 73 (ext. 104)

- Time frame for the evaluation process is given below:

It is expected to start terminal evaluation in July, 2012.

The proposed dates for the in-country mission to Armenia are in the period of June 25–July 10, 2012. The assignment is to be completed no later than August 31, 2012.

Activity	Timing	Estimated duration
Desk review		4 days
Briefing for evaluator by UNDP CO and Project Manager		1 day
Field visits, interviews, questionnaires		5 days
Debriefings		1 day
Drafting of evaluation report, validation of preliminary findings with stakeholders through circulation of draft report for comments,		5 days
Finalization and submission of the final TE report		4 days

Working days - 20 working days

10. APPLICATION PROCEDURE

- Applicants are requested to apply online on <http://jobs.undp.org> by date, time, CET
- The application should contain current and complete CV in English with indication of the e-mail and phone contact.
- Shortlisted candidates will be invited to present a price offer indicating the total cost in USD of the assignment (including the daily fee, per diem and travel costs).

UNDP applies fair and transparent selection process that would take into account the competencies/skills of the applicants as well as their financial proposals.

UNDP is a non-smoking work environment.

Due to large number of applicants, UNDP regrets that it is unable to inform unsuccessful candidates about the outcome or status of the recruitment process.

UNDP is an equal opportunity employer and all qualified candidates are encouraged to apply.

11. TERMS OF REFERENCE ANNEXES

Annex 1:	Terminology in the GEF Guidelines to Terminal Evaluations
Annex 2:	Co-financing and Leveraged Resources
Annex 3:	List of documents to be reviewed by the evaluators
Annex 4:	Tentative List of Meetings to be Held
Annex 5:	Rating Tables

Annex 1. Explanation on Terminology Provided in the GEF Guidelines to Terminal Evaluations

Implementation Approach includes an 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.

Some elements of an effective implementation approach may include:

- The logical framework used during implementation as a management and M&E tool
- Effective partnerships arrangements established for implementation of the project with relevant stakeholders involved in the country/region
- Lessons from other relevant projects (e.g., same focal area) incorporated into project implementation
- Feedback from M&E activities used for adaptive management.

Country Ownership/Drivenness is the relevance of the project to national development and environmental agendas, recipient country commitment, and regional and international agreements where applicable. Project Concept has its origin within the national sectoral and development plans

Some elements of effective country ownership/drivenness may include:

- Project Concept has its origin within the national sectoral and development plans
- Outcomes (or potential outcomes) from the project have been incorporated into the national sectoral and development plans
- Relevant country representatives (e.g., governmental official, civil society, etc.) are actively involved in project identification, planning and/or implementation
- The recipient government has maintained financial commitment to the project
- The government has approved policies and/or modified regulatory frameworks in line with the project’s objectives

For projects whose main focus and actors are in the private-sector rather than public-sector (e.g., IFC projects), elements of effective country ownership/drivenness that demonstrate the interest and commitment of the local private sector to the project may include:

- The number of companies that participated in the project by: receiving technical assistance, applying for financing, attending dissemination events, adopting environmental standards promoted by the project, etc.
- Amount contributed by participating companies to achieve the environmental benefits promoted by the project, including: equity invested, guarantees provided, co-funding of project activities, in-kind contributions, etc.
- Project’s collaboration with industry associations

Stakeholder Participation/Public Involvement consists of three related and often overlapping processes: information dissemination, consultation, and “stakeholder” participation. Stakeholders are the individuals, groups, institutions, or other bodies that have an interest or stake in the outcome of the GEF-financed project. The term also applies to those potentially adversely affected by a project.

Examples of effective public involvement include:

Information dissemination

- Implementation of appropriate outreach/public awareness campaigns

Consultation and stakeholder participation

- Consulting and making use of the skills, experiences and knowledge of NGOs, community and local groups, the private and public sectors, and academic institutions in the design, implementation, and evaluation of project activities.

Stakeholder participation

- Project institutional networks well placed within the overall national or community organizational structures, for example, by building on the local decision making structures, incorporating local knowledge, and devolving project management responsibilities to the local organizations or communities as the project approaches closure.
- Building partnerships among different project stakeholders.
- Fulfillment of commitments to local stakeholders and stakeholders considered to be adequately involved.

Sustainability measures the extent to which benefits continue, within or outside the project domain, from a particular project or program after GEF assistance/external assistance has come to an end. Relevant factors to improve the sustainability of project outcomes include:

- Development and implementation of a sustainability strategy.
- Establishment of the financial and economic instruments and mechanisms to ensure the ongoing flow of benefits once the GEF assistance ends (from the public and private sectors, income generating activities, and market transformations to promote the project's objectives).
- Development of suitable organizational arrangements by public and/or private sector.
- Development of policy and regulatory frameworks that further the project objectives.
- Incorporation of environmental and ecological factors affecting future flow of benefits.
- Development of appropriate institutional capacity (systems, structures, staff, expertise, etc.).
- Identification and involvement of champions (i.e. individuals in government and civil society who can promote sustainability of project outcomes).
- Achieving social sustainability, for example, by mainstreaming project activities into the economy or community production activities.
- Achieving stakeholder consensus regarding courses of action on project activities.

Replication approach, in the context of GEF projects, is defined as lessons and experiences coming out of the project that are replicated or scaled up in the design and implementation of other projects. Replication can have two aspects, replication proper (lessons and experiences are replicated in different geographic area) or scaling up (lessons and experiences are replicated within the same geographic area but funded by other sources). Examples of replication approaches include:

- Knowledge transfer (i.e., dissemination of lessons through project result documents, training workshops, information exchange, a national and regional forum, etc).
- Expansion of demonstration projects.
- Capacity building and training of individuals, and institutions to expand the project's achievements in the country or other regions.
- Use of project-trained individuals, institutions or companies to replicate the project's outcomes in other regions.

Financial Planning includes actual project cost by activity, financial management (including disbursement issues), and co-financing. If a financial audit has been conducted the major findings should be presented in the TE.

Effective financial plans include:

- Identification of potential sources of co-financing as well as leveraged and associated financing¹.
- Strong financial controls, including reporting, and planning that allow the project management to make informed decisions regarding the budget at any time, allows for a proper and timely flow of funds, and for the payment of satisfactory project deliverables
- Due diligence in the management of funds and financial audits.

Co financing includes: Grants, Loans/Concessional (compared to market rate), Credits, Equity investments, In-kind support, other contributions mobilized for the project from other multilateral agencies, bilateral development cooperation agencies, NGOs, the private sector and beneficiaries. Please refer to Council documents on co-financing for definitions, such as GEF/C.20/6.

Leveraged resources are additional resources—beyond those committed to the project itself at the time of approval—that are mobilized later as a direct result of the project. Leveraged resources can be financial or in-kind and they may be from other donors, NGO’s, foundations, governments, communities or the private sector. Please briefly describe the Identification of potential sources of co-financing as well as leveraged and associated financing.

Cost-effectiveness assesses the achievement of the environmental and developmental objectives as well as the project’s outputs in relation to the inputs, costs, and implementing time. It also examines the project’s compliance with the application of the incremental cost concept. Cost-effective factors include:

- Compliance with the incremental cost criteria (e.g. GEF funds are used to finance a component of a project that would not have taken place without GEF funding.) and securing co-funding and associated funding.
- The project completed the planned activities and met or exceeded the expected outcomes in terms of achievement of Global Environmental and Development Objectives according to schedule, and as cost-effective as initially planned.
- The project used either a benchmark approach or a comparison approach (did not exceed the costs levels of similar projects in similar contexts)

Monitoring & Evaluation. Monitoring is the 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, so that timely action can be taken to correct the deficiencies detected. Evaluation is a process by which program inputs, activities and results are analyzed and judged explicitly against benchmarks or baseline conditions using performance indicators. This will allow project managers and planners to make decisions based on the evidence of information on the project implementation stage, performance indicators, level of funding still available, etc, building on the project’s logical framework.

Monitoring and Evaluation includes activities to measure the project’s achievements such as identification of performance indicators, measurement procedures, and determination of baseline conditions. Projects are required to implement plans for monitoring and evaluation with adequate funding and appropriate staff and include activities such as description of data sources and methods for data collection, collection of baseline data, and stakeholder participation. Given the long-term nature of many GEF projects, projects are also encouraged to include long-term monitoring plans that are sustainable after project completion.

¹ Please refer to Council documents on co-financing for definitions, such as GEF/C.20/6. The following page presents a table to be used for reporting co-financing.

Annex 2: Co-financing and Leveraged Resources

Table 1: Co-financing Table

Co financing (Type/Source)	IA own Financing (mln US\$)		Government (mln US\$)		Other Sources* (mln US\$)		Total Financing (mln US\$)		Total Disbursement (mln US\$)	
	Proposed	Actual	Proposed	Actual	Proposed	Actual	Proposed	Actual	Proposed	Actual
Grants										
Loans										
Credits										
Equity investments										
In-kind support										
Non-grant Instruments										
Other Types (*)										
Totals										

* Other is referred to contributions mobilized for the project from other multilateral agencies, bilateral development cooperation agencies, NGOs, the private sector and beneficiaries.

- “Proposed” co-financing refers to co-financing proposed at CEO endorsement.
- Please describe “Non-grant Instruments” (such as guarantees, contingent grants, etc)
- Please explain “Other Types of Co-financing”
- Explain “Other Sources of Co-financing”

Leveraged Resources

Leveraged resources are additional resources—beyond those committed to the project itself at the time of approval—that are mobilized later as a direct result of the project. Leveraged resources can be financial or in-kind and they may be from other donors, NGO’s, foundations, governments, communities or the private sector. Please briefly describe the resources the project has leveraged since inception and indicate how these resources are contributing to the project’s ultimate objective.

Annex 3: List of Documents to be reviewed by the evaluators

- Project document
- Inception report
- Annual/Multiyear work plans
- Project financial work plans and expenditure reports
- 2011 UNDP/GEF Project Implementation Report (PIR)
- Minutes of the Steering Committee meetings
- Minutes of the stakeholder meetings
- Mid-term Evaluation Report and management response
- GEF monitoring and Evaluation Policies
- Other upon request.

Annex 4: Tentative List of Meetings to be Held

Location	Meetings
UNDP Armenia	Meeting with Environmental Governance Portfolio
Project Office	Meeting with UNDP/GEF Project Manager, Assistant and task leaders
Ministry of Nature Protection	Meeting with UNDP/GEF National Project Director and National project Coordinator
Yerevan, Avan, "ArmRosCogeneracia" CJSC	Meeting with the administration of the "ArmRosCogeneracia" CJSC
Pilot projects sites in Yerevan	Meetings with: Directors of the Boarding school #1 and #2, AYB School , Arabkir Youth Centre
Pilot Project sites in Spitak and Aparan	Meeting with Mayor of Spitak and Deputy Mayor of Aparan

Annex 5. Rate Tables

Table 1: Status of objective / outcome delivery as per measurable indicators

Objective	Measurable Indicators From Project Logframe	End-of-Project Target	Status of Delivery*	Rating**
Objective:				
Outcomes		End-of-Project Target	Status of Delivery	Rating
Outcome 1:				

Outcome 2:				
Outcome 3:				
Outcome 4:				

* *Status of delivery colorings codes:*

Green / completed – indicator shows successful achievement

Yellow – indicator shows expected completion by the end of the project

Red – Indicator show poor achievement - unlikely to be complete by end of Project

**** Rating:**

Highly Satisfactory = HS

Satisfactory = S

Moderately Satisfactory = MS

Moderately Unsatisfactory = MU

Unsatisfactory = U

Highly Unsatisfactory =HU

Table 2: Project Ratings

PROJECT COMPONENT OR OBJECTIVE	RATING SCALE						RATING*
	HU	U	MU	MS	S	HS	
Project concept, design							
<i>Project strategy/relevance</i>							
<i>Stakeholder involvement</i>							
Project Implementation							
<i>Project's Adaptive Management</i>							
<i>Monitoring and Evaluation</i>							
<i>Stakeholder Participation</i>							
Project Results							
<i>Attainment of Outcomes/Achievement of Objectives</i>							
Objective							
Outcome 1							
Outcome 2							
Outcome 3							
Outcome 4							

***Rating:**

Highly Satisfactory = HS

Satisfactory = S

Moderately Satisfactory = MS

Moderately Unsatisfactory = MU

Unsatisfactory = U

Highly unsatisfactory = HU

Annex 6: Itinerary

MISSION AGENDA

In-country mission of **Mr. Jiri Zemman**, International Expert for Project Terminal Evaluation,
“Armenia – Improving Energy Efficiency of Municipal Heating and Hot Water Supply” UNDP/GEF/00035799 project

(09 – 16 July, 2012)

Mission Purpose:

- Meetings and interviews at UNDP CO, Project Team, Project Responsible Partners, national partners, members of Steering Committee, beneficiaries, counterparts and subcontractors.
- Field visit to the demo project sites and meeting with municipalities

Time	Venue	Purpose	Other Participants
Monday, 09 July 2012 – Yerevan			
10:30 - 12:30	Project office	<ul style="list-style-type: none"> • Meeting with the Project Management and Team 	<ul style="list-style-type: none"> • Ms. Diana Harutyunyan, CC Programme Coordinator and Project Manager • Ms. Rubina Stepanyan, CC Programme Associate • Mr. Robert Kharazyan, National Expert Team Leader • Ms. Marina Sargsyan, National Expert (2nd component) • Mr. Edik Keryan, National Expert (3rd component) • Ms. Svetlana Galoyan, National Expert (1st component) • Ms. Marianna Arzangulyan, Expert Team Assistant
12: 30 - 13:30	UNDP CO	<ul style="list-style-type: none"> • Meeting with UNDP Senior Management and UNDP Environmental Governance Portfolio 	<ul style="list-style-type: none"> • Mr. Armen Martirosyan, EG Portfolio Analyst
13:30 - 14:30	<i>Lunch</i>		
14:30 - 17:00	Project office	<ul style="list-style-type: none"> • Meeting with Project Lead experts and working with documents 	

17:00 - 18:00	Project office	<ul style="list-style-type: none"> • Meeting with National Coordinator 	<ul style="list-style-type: none"> • Mr. Aram Gabrielyan, UNFCCC Focal Point
Tuesday, 10 July 2012 – Yerevan			
09:00 - 10:00	Project office	<ul style="list-style-type: none"> • Meeting with the Project Management and Team 	<ul style="list-style-type: none"> • Mr. Edik Keryan, National Expert (3rd component) • Ms. Svetlana Galoyan, National Expert (1st component)
10:00 - 13:00	Site visit Avan District, “Armroscogeneration” office	<ul style="list-style-type: none"> • Meeting with Director and Chief Engineer of the “Armroscogeneration” CJSC 	<ul style="list-style-type: none"> • Mr. Mikael Rostomyan, Director • Mr. Nerses Davtyan, Chief engineer • Mr. Nikolay Balyan, Chief of Station • Mr. Robert Bugdaryan - Head of Production and Technical Issues Division • Ms. Marina Sargsyan • Mr. Edik Keryan • Mr. Vahan Martirosyan, Monitor/Driver
	Avan District	<ul style="list-style-type: none"> • Visit to the buildings switched to the DH system 	<ul style="list-style-type: none"> • Mr. Mikael Rostomyan, Director • Mr. Robert Bugdaryan, • Mr. Khachik Khachtryan, Head of consumer department • Mr. Nikolay Balyan, Chief of Station • Ms. Marina Sargsyan • Mr. Edik Keryan • Mr. Vahan Martirosyan, Monitor/Driver • Apartment owners- consumers
	#1 Child Care Protection Center, Yerevan	<ul style="list-style-type: none"> • Pilot site visit and meeting with director 	<ul style="list-style-type: none"> • Ms. Marine Hovhannisyan, Director (285404: 28 4876) • Mr. Edik Keryan • Ms. Marina Sargsyan • Mr. Vahan Martirosyan, Monitor/Driver
13:00 - 14:00	<i>Lunch</i>		
15:30 - 16:30	Site visit #70 Aveitsyan str. boiler house	Meeting with Director	<ul style="list-style-type: none"> • Mr. Arthur Azizbekyan, Director • Mr. Edik Keryan • Ms. Marina Sargsyan • Mr. Vahan Martirosyan, Monitor/Driver

17:00 - 18:00	Ministry of Urban Development of RA	Meeting with members of Steering Committee	<ul style="list-style-type: none"> • Mr. Samvel Srapyan, Head of Communal and Housing Division • Ms. Ovsanna Karapetyan, Head of Technical Norms and Standards Division of Scientific-Technical Policy Department • Ms. Diana Harutyunyan
Wednesday, 11 Jul y 2012 – Yerevan, Aparan, Spitak			
09:30 - 10:30	Ministry of Energy and Natural Resources	<ul style="list-style-type: none"> • Meeting with member of Steering Committee 	<ul style="list-style-type: none"> • Mr. Hrach Tsughunyan, Head of Development Division (091258636) • Ms. Diana Harutyunyan • Interpreter
11:00 -12:00	R2E2 office	Meeting with Fund administration	<ul style="list-style-type: none"> • Ms. Tamara Babayan, Director (093930030) • Mr. Hayk Yesayan, Deputy Director • Ms. Diana Harutyunyan • Interpreter
12:30 – 13:30	<i>Lunch</i>		
13:30 – 18:00	Site visit Aparan	<ul style="list-style-type: none"> • Aparan municipality • Pilot buildings 	<ul style="list-style-type: none"> • Mr. Georgi Abrahamyan, Deputy Mayor of Aparan • Mr. Aram Gabrielyan, Project National Coordinant • Mr. Edik Keryan • Mr. Vahan Martirosyan Project Monitor/Driver • Interpreter
	Spitak city	Spitak Municipality Pilot projects site visit (two boiler houses)	<ul style="list-style-type: none"> • Mr. Gagik Sahakyan, Mayor of Spitak • Ms. Anahit Gyulazyan, Deputy Mayor of Spitak • Mr. Aram Gabrielyan, Project National Coordinant • Mr. Edik Keryan • Mr. Vahan Martirosyan, Project Monitor/Driver • Interpreter
Thursday, 12 July 2012 - Yerevan			
09:00 -10:30	Project Office	Meeting with project team	
11:00 - 12:00	Public Services Regulatory Commission	<ul style="list-style-type: none"> • Meeting with advisers and member of Steering Committee and PSRC advisers 	<ul style="list-style-type: none"> • Mr. Mushegh Koshetsyan, Commissioner (091412233) • Mr. Karen Khojagoryan, Head of investment monitoring division of PSRC • Mr. Robert Tsovyan, Adviser • Mr. Gahram • Interpreter

12:00 - 13:00	Project Office	Meeting with project team	
13:00 - 14:00	<i>Lunch</i>		
14:00 - 17:00	Project Office	Working with documents and project team	
17:00 – 17:30	Ministry of Nature Protection of RA	<ul style="list-style-type: none"> Meeting with Project Implementing and Responsible Partner 	<ul style="list-style-type: none"> Mr. Simon Papyan, First Deputy Minister and UNDP Projects' National Director Ms. Diana Harutyunyan
Friday, 13 July 2012 - Yerevan			
09:00-11:00	Project office	<ul style="list-style-type: none"> Meeting with the Project Management 	
11:00-12:00	UNDP CO	Meeting with Implementing Agency	<ul style="list-style-type: none"> Mr. Armen Martirosyan, EG Portfolio Analyst Ms. Diana Harutyunyan
13:00 -14:00	<i>Lunch</i>		
14:00 -18:00	Project office	Working with documents and Project Management	
Saturday, 14 July, and Sunday, 15 July 2012 – trip to Goris town of Syunik marz			
	Site Visit Goris	<ul style="list-style-type: none"> Pilot project in Goris Medical Center Pilot project Goris social housing - Energy Efficiency in Buildings 	<ul style="list-style-type: none"> Mr. Vahran Jalalyan, Task Leader, Energy Efficiency in Buildings project Mr. Vahan Martirosyan, Project Monitor/Driver

Annex 7: List of persons interviewed

- Ms. Diana Harutyunyan, UNDP CC Programme Coordinator and Project Manager
- Ms. Rubina Stepanyan, UNDP CC Programme Associate
- Mr. Robert Kharazyan, UNDP National Expert Team Leader
- Ms. Marina Sargsyan, UNDP National Expert (2nd component)
- Mr. Edik Keryan, UNDP National Expert (3rd component)
- Ms. Svetlana Galoyan, UNDP National Expert (1st component)
- Ms. Marianna Arzangulyan, UNDP Expert Team Assistant
- Mr. Vahan Martirosyan, UNDP Project Technical Monitoring and driver
- Mr. Armen Martirosyan, Portfolio Analyst, Environmental Governance, UNDP Armenia
- Dr. Aram Gabrielyan, UN FCCC National Focal Point, Project National Coordinator, Ministry of Nature Protection
- Mr. Mikael Rostomyan, Director, “ArmRosCogeneration” CJSC
- Mr. Nerses Davtyan, Chief Engineer, “ArmRosCogeneration” CJSC
- Mr. Nikolay Balyan, Chief of Station, “ArmRosCogeneration” CJSC
- Mr. Khachik Khachtryan, Head of consumer department, , “ArmRosCogeneration” CJSC
- Avan district apartment owners, ArmRosCogeneration clients
- Director of the kindergarten in Avan district, ArmRosCogeneration client
- Mr. Robert Bugdaryan - Head of Production and Technical Issues Division, “ArmRosCogeneration” CJSC
- Ms. Marina Hovhannisyan, Director, Child Care and Protection Boarding Institution No. 1, Yerevan
- Mr. Artur Asisbegbegyan, Director, “Yerferz” OJSC (solar panels)
- Mr. Samvel Srapyan, Head of Housing Fund Management and Communal Infrastructures Division, Ministry of Urban Development of RA
- Ms. Ovsanna Karapetyan, Head of Technical Norms and Standards Division of Scientific-Technical Policy Department, Ministry of Urban Development of RA
- Mr. Hrachya Tsughunyan, Head of the department of development, Ministry of Energy and Natural resources, Republic of Armenia
- Ms. Tamara Babayan, Director, Armenia Renewable Resources and Energy Efficiency Fund

- Mr. Hayk Yesayan, Implementation and Monitoring Coordinator, Armenia Renewable Resources and Energy Efficiency Fund
- Mr. Georgi Yeremyan, Deputy Head of Municipality, Municipality of Aparan
- Mr. Gagik Sahakyan, Mayor, Spitak Municipality
- Ms. Anahit Gyulazyan, Deputy Mayor, Spitak Municipality
- Mr. Mushegh Koshetsyan, Commissioner, Public Services Regulatory Commission, Republic of Armenia
- Mr. Karen Khojagoryan, Head of Investment Monitoring Division, Public Services Regulatory Commission
- Mr. Garegin Baghramyan, Head of Tariff Policy Division, Public Services Regulatory Commission
- Mr. Robert Tsovyan, Advisor, Public Services Regulatory Commission
- Mr. Simon Papyan, First Deputy Minister, Ministry of Nature Protection, Republic of Armenia, UNDP National Project Director
- Mr. Armen Martirosyan, Portfolio Analyst, Environmental Governance, UNDP Armenia

Annex 8: List of documents reviewed

General documentation

- UNDP Programme and Operations Policies and Procedures
- UNDP Handbook for Monitoring and Evaluating for Results
- GEF Monitoring and Evaluation Policy
- GEF focal area strategic program objectives

Project documentation

- GEF approved project document and Request for CEO Endorsement
- Project Inception Report
- Annual Work Plans
- Annual Project Reports
- Project Implementation Review
- CDR
- Quarterly Reports
- Project Outcome Board Meeting minutes
- Project Steering Committee Meeting minutes
- Updated risk log
- Mid-Term Evaluation Report, Armenia: Improving Energy Efficiency of Municipal Heating and Hot Water Supply, Grant Ballard-Tremeer, Eco Ltd., September 2008
- Financial Audit Reports 2007, 2009, 2010
- Project internal financial records (financial spreadsheet)

Project web sites:

<http://www.nature-ic.am>

<http://uz.beeca.net>

Project deliverables:

- Removing Barriers to Energy Efficiency in Municipal Heat and Hot Water Supply – Report, Yerevan 2001
- Possibilities for Reconstructing and Improving the Energy Efficiency of Municipal Heating in the Republic of Armenia based on the Sector's 2005 Situation Analysis, Yerevan 2005
- Analysis of the Energy Efficient Heat Supply Options of the Multi-Apartment Buildings in the Republic of Armenia, Yerevan 2006
- Current State of Heat Supply in Residential Sector of the Republic of Armenia as of April 2008, Yerevan, 2008

- Analytical report on “Armenia – Improving Energy Efficiency of Municipal Heating and Hot Water Supply” UNDP/GEF/00035799 – Project’s Activities During 2008-2009, Yerevan, 2009
- Analytical report on “Armenia – Improving Energy Efficiency of Municipal Heating and Hot Water Supply” UNDP/GEF/00035799 – Project’s Activities During 2009-2010, Yerevan, 2010
- Analytical report on “Armenia – Improving Energy Efficiency of Municipal Heating and Hot Water Supply” UNDP/GEF/00035799 – Project’s Activities During 2010-2011, Yerevan, 2011
- Lessons Learned from the UNDP/GEF project in Armenia: Improving Energy Efficiency of Municipal Heating and Hot Water Supply, Yerevan, June 2012
- Pilot projects information Fact Sheets
- Expressions of interest: Memorandums of Understanding and Letters of Interests
- Feasibility and prefeasibility studies: Avan prefeasibility study, Avan and Davidashen Feasibility Studies (Ramboll, 2006), Achapnyak feasibility study, International school in Dilijan pre-feasibility study, Gagarin pre-feasibility study, Sevan feasibility study
- Methodology of GHG monitoring and emission reduction calculation, Yerevan 2012
- Draft of the Heat Law, Yerevan, 2008
- Capacity Building for Introducing Energy Efficiency Labeling System for Energy Consuming Appliances, Summary of the study, Yerevan, 2010
- Other project documents, presentations and media coverage

Annex 9: Comments by stakeholders (only in case of discrepancies with evaluation findings and conclusions)