

Government of Armenia

United Nations Development Programme

Global Environment Facility

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 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 will: (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 will complement, and will 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.

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Part Ia Situation Analysis

1. As a consequence of the economic and energy crisis that followed the separation of Armenia and its neighboring countries from the former Soviet Union in 1990, the municipal heat and hot water supply systems in all the Armenian cities essentially collapsed¹. While in some cities the operations of the former, centralized district heating (DH) system have been partially restored, the vast majority of the urban population still lacks organized heat and hot water supply services. As such, the people have been forced to use electricity, wood, gas, kerosene or any other available means to cover their heating needs. This has led, among others, to the i) massive harvesting of trees with serious environmental damages; ii) indoor air quality problems; iii) overloading of the power distribution systems; and iv) stretching of the already very tight family budgets, in particular when using electricity for heating.

2. A survey² of households in Yerevan indicated that the heating and hot water preparation in Yerevan in 2000 was based on the use of: electric heaters (50.1%), district heating (27.5%), wood fuel (15.4%), natural gas (4.4 %), kerosene (2.3%) and coal (0.3 %). For Armenia as a whole, the figures were: wood fuel (33.7%), electricity (30.3%), natural gas (16.7%), district heating (15.3%), dung (2.0%) and others (2.0%). Additional information on the heat supply structure in other Armenia cities is presented in Table 1 in section "Replication".

3. Due to the extensive use of fuel wood for heating purposes, it has been estimated that during 1992-1999 some 6 million m³ or 7 thousand hectares of forests were clear-cut and approximately 100 thousand hectares (or 30 % of the total forest coverage) partially cut. Given the scarce forest resources of Armenia in general, these massive cuttings have disrupted the ecological balance and resulted in a chain reaction of a number of negative ecological impacts. These impacts include the loss of biodiversity, accelerated erosion, floods, landslides and weakening of the water protection function of the forests. The unsustainable use of forests at the rates exceeding regeneration has also caused the burning of wood to become a net carbon-emitting source with associated specific emissions of nearly two times that of natural gas.

4. Along with general development of the economic situation, the increased use of electricity for heating and hot water preparation has been a prevailing trend. Taking into account that this additional power load in the winter time is mainly covered by the thermal power plants, the primary energy consumption and the associated GHG emissions can be estimated to be about 2-4 times higher than by covering the same heating needs by converting primary energy such as natural gas directly into heat. For more details about the specific GHG emissions of the different heating methods, see Annex F.

5. In the areas, in which the operations of the former DH system have been restored, the system suffers from very high losses reaching up to 50-60% of the primary energy consumption. This loss is substantial, especially when compared with modern, well-

¹ Until 1991, the centralized district heating was the prevailing heat and hot water supply method in urban areas heating 14 million square meters (sqm) of a total of 22 million sqm of residential space in 55 municipalities and a large number of public buildings such as schools and hospitals.

² The survey was conducted during the PDF B phase of the project

maintained DH systems with typical overall system losses of 25-30 % of the primary energy use.

6. During the PDF B phase of the project as well as separately by the World Bank supported “Urban Heating Strategy project” (implemented in 2001-2002 with an objective to assist the Government of Armenia to prepare and adopt an Urban Heating Strategy), several different alternatives for developing the heat and hot water supply systems towards financially and environmentally more sustainable ones were analyzed. In the strategy proposed and later adopted by the Government (see paragraph 7), the foreseen development was divided into three phases: Year 1-2 “Survival” keeping the existing centralized heating systems operational with minimum investments and taking the first measures to develop and test more sustainable approaches; Year 2-5 “Recovery” developing and starting the implementation of those heating options, which can be considered as the most feasible ones; and Year 6-25 “Growth” attracting investments, as applicable, for the rehabilitation of centralized district heating systems and/or more decentralized options, depending on their technical and financial feasibility in each city and city district concerned.

7. In September 2002, the Government of Armenia adopted the Decree No 1384 N “On Reforms in Urban Heating System of the Republic of Armenia” adopting the Urban Heating Strategy and calling for the major restructuring of the heat and hot water supply sector and the increased private sector participation for the development of this segment of the economy. Among other issues, the elimination of cross-subsidies, the privatization of the existing municipal DH companies, the transfer of a part of the assets to condominiums for organizing their own heat and hot water supply services and the introduction of consumption based billing are addressed. The Decree also calls for the preparation of an investment program in co-operation with the World Bank / IDA and further negotiations with the UNDP/GEF on the possibilities to provide technical assistance for addressing the energy efficiency and environment related aspects of this restructuring process. For complete information on Decree 1384 N, see Annex H. Improved energy efficiency of the heat and hot water supply is also listed in the first National Communication of Armenia as one of the priority options to reduce country's GHG emissions.

8. As a follow up of the provisions of the Decree 1384 N, the World Bank is currently preparing an IDA credit at the estimated value of USD 10 million under the title “Urban Heating Project”. For additional information on the WB's Urban Heating Project and foreseen co-operation arrangements with the proposed UNDP/GEF project, see section “Incremental Cost and Project Financing”.

Barrier Analysis

9. During the project preparatory (PDF B) phase, several barriers were identified that hamper the sustainable development of the heat and hot water supply sector in Armenia. The key barriers are outlined below.

- a) *Weak institutional, legal and regulatory framework that does not allow or encourage the existing municipal 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.*

The recent adoption of the Government Decree 1384 N provides the necessary basic foundation for promoting the sustainable development of the heat and hot water supply services in Armenia. There are, however, several legal and regulatory provisions, and technical standards from the past that need to be reviewed and, as applicable, revised to make them consistent with the Decree's objectives and to promote the specific project objectives in the field of energy efficiency and GHG emissions reduction. Areas in which the legal and regulatory framework would need to be further developed include:

Institutional

- certification of the new, qualified service providers, and streamlined procedures to allow them to enter the market;
- transparency of accounting, cost structure and payment collection of the heat supply companies; and,
- strengthening the role of the condominiums as credible, legally and financially responsible counterparts for the commercial heat service providers.

Legal and Regulatory

- contracts between the heat suppliers and consumers, and streamlined mechanisms and procedures for solving disputes and conflicts;
- social support schemes to address the problem of low solvency of the population, but to be targeted at the most needy families, instead of subsidizing the heat supply system as a whole;
- tariff setting to allow for full cost recovery by the heat supply companies, covering the operational expenses, the necessary new investments as well as normal level of profit;
- enforcement of the practice of consumption based metering and billing so as to provide the basis and incentives for the heat supply companies as well as to the consumers to improve their energy efficiency;
- enforcement of payment collection by the heat supply companies or condominiums (including technical, institutional and legal instruments);
- norms and enforcement mechanisms to prevent the non-sustainable use of forest resources as wood fuel;
- technical standards so as to allow or enforce the modernization of the heating and hot water supply systems, including enhanced possibilities for regulating the heat consumption both at the building and the final end user level; and
- creating an enabling regulatory framework otherwise to encourage the increased private sector involvement in the heat and hot water supply sector;

b) 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.

Apart from the general provisions of the Urban Heating Strategy, there is no concrete implementation plan yet to facilitate the effective restructuring of heat supply companies despite the apparent viability of these operations. This implementation plan should address the introduction of a consumption based metering and billing system,

the step-wise commercialization and full cost recovery of the services provided, as well as capacity building and training needs of the management and operating personnel of the restructured companies to improve the efficiency of their operations.

Based on the experiences gained from the heating sector restructuring efforts in other countries, one of the most important measures and fundamentals for providing incentives to both the end users and heat suppliers to improve their energy efficiency is to shift from a flat fee tariff and billing system to consumption based billing system. In order to leverage financing for the actual investments needed, there is also a need to improve the payment collection rate so that the heat supply companies can demonstrate the full cost recovery of their services and to convince the potential financiers for the return of the investments made.

Due to the current economic conditions of Armenia, many families experience difficulties in paying for even very basic communal services at rates that allow for full cost recovery by the suppliers. Therefore, there is a continued need for the Government to support the poorest part of the population to cover their expenses for these basic services. A general approach that has been recommended in other countries is that, instead of subsidizing the heat supply sector as a whole through artificial low tariffs or by allowing no or partial payments for the services received, the heat supply companies should be allowed and obliged to operate according to the normal commercial principles. When state subsidies are needed, they should be targeted to support directly those families that really need help to pay for the basic services that are essential for their survival, including reasonable heating and hot water supply. In order to make the system work in practice and to reduce the over-subsidization of the sector, there is a parallel need for technical measures that allow the consumers individually and/or collectively at the building level to regulate their heat consumption according to their solvency and comfort requirements.

In order to enforce the payment collection, there needs to be a technical mechanism and legal foundation for the heat supplier to cut off the service in the case of non-payment. In the case of natural monopolies that may exist, the tariff setting and billing principles have to be made transparent, so that the consumers know what they are actually paying for.

While the Urban Heating Strategy provides a general policy framework for overcoming the barriers discussed above, until now there has been no system in place to evaluate, test and gain experience with different approaches to organizing the consumption based metering and billing and to improving the payment collection rate in practice.

There is also a lack of knowledge of new alternative energy efficient DH systems. The use of advanced energy technologies is critical to reducing GHG emissions and to ensure future energy security. There is a need, therefore, to assess all technological solutions and their market cost based on taxes and fuel price risks and technology commercialization issues.

c) 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

During the Soviet time, most apartments were owned by the state and all the communal as well as the general management and maintenance services of the buildings were provided by the state practically for free of charge. Therefore, there was neither much need nor possibilities or incentives for the consumers to organize themselves as condominiums to procure the different communal services or to maintain the building in a good condition otherwise.

Despite that condominiums were privatized after Armenia became an independent state in 1991; many former practices of building management have remained. Although the collapse of the heating system in most cities in 1992 forced individuals to come up with miscellaneous individual solutions, the organization of the heat and hot water supply is still broadly perceived as ultimately the responsibility of the state. In spite of this perception, should the state not be able to provide these services, most people feel more comfortable with solving their own problems individually rather than co-operating with the other residents in their building. Beside the general lack of experience with, and possible mistrust of, collective action, a contributing factor is that in many buildings the income levels of the residents can vary significantly.

In addition to the lack of experience with collective action related to condominium management, there is a lack of information and capacity among the residents on how to effectively organize themselves as condominiums, manage their operations, and address the issue of willingness to pay for heat and hot water services.

d) 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.

While some new local companies have emerged over the past few years with an objective to start the provision of commercial, small scale heating services relying mainly on the use of gas in decentralized mini-DH networks or building boilers, the owners of the companies do not necessarily pose the skills needed to prepare “bankable” investment proposals, to structure financing for them, to overcome all the institutional barriers and/or to manage the commercially sustainable operation of the companies otherwise.

Part Ib Strategy

10. The objective of the project is to reduce the GHG emissions from the heating sector in Armenia (for further details see paragraph 17 and the section “Replication”) and to ensure that climate change aspects will be fully taken into account in developing the heat and hot water supply sector in Armenia towards a more energy efficient and sustainable direction. The project will address the existing institutional and capacity barriers to energy efficiency and complement other ongoing initiatives in Armenia through close co-operation with the World Bank managed Urban Heating Project, the Government of Netherlands funded “Industrial Development of the DH Industry in Armenia” project and the envisaged USAID funded activities in the field of energy and environment. Additional opportunities for co-operation will also be explored with other donors, including projects supported by the German Technical Co-operation Funds (GTZ) in the areas of urban development and the promotion of municipal self-help institutions and the promotion of small and medium-sized private-sector enterprises (SMEs) in regard to trade, production and services. A detailed

description of the project objectives and activities is presented in the “Project Results Framework”, pages 11-18.

11. As a result of the close co-ordination of the project preparatory activities with the other planned and ongoing activities in Armenia, a unique basis currently exist for launching a well coordinated and integrated effort to assist the Government of Armenia in the sustainable development of the urban heat and hot water supply services by fully taking into account also the climate change concerns. Within this framework, the support requested for capacity building and other technical assistance activities through UNDP/GEF is seen as an essential and elementary piece of the overall package to ensure the sustainability of the effort.

12. The attention to heating sector problems and their environmental and social impacts has increased substantially over the past few years. Following up the recommendations of the Urban Heating Strategy, the Government of Armenia will over the next few years closely test, monitor and evaluate the different possible solutions to the heating sector problems with an objective to determine the most feasible approach(es) to be followed in the long term. From the greenhouse gas emission reduction point of view, this time period will be crucial as the GHG emission impacts of the different approaches can differ substantially from each other and each option requires some major infrastructure investments, which will make it difficult to switch between the different alternatives afterwards. For more details on the GHG impacts of the different options, see Annex F. As some 27% of Armenia’s CO₂ emissions or 20% of the total GHG emissions can be estimated to be due to meeting the heating needs of the population, the impact also at the level of the national GHG balance can be viewed as significant. The impact can be further enhanced by utilizing the experiences and lessons learnt for replicating the activities at the regional level.

13. By building on the co-operation agreement reached during the project preparatory phase with the key ministries and with the other main donors working in the heat and hot water supply sector in Armenia, the project will present an unique opportunity for introducing the climate change aspects into the ongoing heating sector reform process from the very beginning. Given the nature of the decisions and investments to be made, the impact will carry over several decades.

14. One of the key approaches to changing the current heat and hot water supply practices and to leveraging increasing financing for this purpose is to strengthen the role of the local condominiums in organizing and procuring the heat and hot water supply services collectively at the building level. First of all, signing the contract with a condominium would reduce the risk of the commercial service providers and is likely to enforce a stricter payment discipline since in the case of non-payment the whole building can be disconnected. Secondly, the introduction of a consumption based metering and billing system and signing a contract at the building level will be considerable easier and cheaper for the service providers than doing it separately for each apartment. Thirdly, many measures to improve the overall energy efficiency of the buildings such as repair of the windows and corridor doors, improved insulation etc. will only be feasible through a collective action. Finally, by effectively organizing themselves, the residents will have an option to make their own investments (e.g. on a mini DH network or building boiler or energy efficient heating and hot water supply systems) thereby providing a feasible alternative for the individual use of electricity or wood fuel or enforcing the other potential

service providers to improve the efficiency of their operations, should they wish to keep up with the competition.

15. In terms of the fuels and technologies, the objective of the project is to reduce the use of electricity and unsustainably produced wood fuel for heating and hot water preparation and to encourage the more efficient use of natural gas in “heat only” applications (via decentralized or centralized approach) and/or waste heat from co-generation, thereby contributing to both reducing GHG emissions and ensuring future energy security. For instance in Yerevan, the economically and environmentally most feasible approach is likely to consist of a mix of different technologies. It can rely on the centralized DH systems and, as applicable, co-generation in the areas, in which their gradual rehabilitation can be economically and financially justified (including the restructuring and commercialization of the remaining DH companies) and, on the other hand, on the decentralized mini DH networks, autonomous building level gas boilers, individual gas heaters in the areas, in which these latter options are economically or financially more realistic. In both centralized “heat only” DH systems and decentralized mini DH grids or building boilers, an option can also be maintained to extend the system later on to include co-generation, should the economic and financial basis for that exist. Renewable and other “alternative” energy technologies will be analyzed and tested, wherever feasible, to minimize GHG emissions and to demonstrate their economic and technical viability in order to attract the private sector investments.

16. As the analysis conducted during the PDF B phase of the project has shown, in terms of GHG emissions the situation is worst when using electricity or unsustainably produced wood for heating. On the other hand, between the centralized or decentralized “heat only” applications there are no fundamental differences, if same primary energy sources and modern state-of-the-art technologies are used. In using the heat from co-generation, the GHG emissions are obviously the smallest, assuming that the co-generation plant is primarily substituting thermal condensing power capacity. For more details, see Annex F.

17. The overall GHG reduction potential in Armenia by accelerating the adoption of more energy efficient approaches and technologies for heat and hot water supply has been estimated at 9.6 Mt of CO₂ over the next 20 years. Additional benefits can be gained by replicating the activities at the regional context. For the first pilot and demonstration projects to be financed jointly by the different donors through their grant resources and by using the resources of the pilot financing scheme to established under the WB/IDA support, the GHG emission reduction potential has been estimated at approximately 0.7 Mt of CO₂ over the next 20 years. The methodology for calculating the GHG emission reduction potential of the project has been discussed in further detail in section “Replication”.

Part IIa. Project Results and Resource Framework and the Annual Workplan

Intended Outcome: Access to sustainable energy services is increased.												
Outcome Indicator: Number of new technologies for energy efficiency and renewable energy introduced. Percentage decrease in specific GHG emissions per unit of delivered heat and hot water supply.												
Applicable MYFF Service Lines: 3.1. Frameworks and strategies for sustainable development 3.3. Access to sustainable energy services												
Partnership Strategy: The programme partnership strategy envisages close cooperation with all key stakeholders. Ministry of Nature Protection as an Executing Agency of the Project and 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 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 and Regional Governors' Offices (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 condominium and promoting the implementation of energy efficiency measures in district heating. Public Services Regulatory Commission for ensuring energy efficiency measures in public services "Industrial Development of the District Heating Industry in Armenia" Project funded by the Government of the Netherlands. WB, USAID, GTZ funded projects envisaged fro 2004-2008 in the field of energy and environment. Projects in the areas of urban development and the promotion of municipal self-help institutions, small and medium-sized private-sector enterprises (SMEs). The Project will work with condominiums, local civil society organizations, district heating and energy service companies for organizing and managing the heat and hot water services collectively at the building level. The Project will also collaborate with media to develop public awareness campaigns. UNDP will be the Project Implementing Agency, that provides technical assistance and coordinates the Project cooperation with other donors, as well as with the UNDP other programme activities.												
Project Title and Number: Armenia – Improving the Energy Efficiency of Municipal Heating and Hot Water Supply												
Proj. ID	Expected Output	Key Activity	Timeframe					Budget				
			Yr 1	Yr 2	Yr 3	Yr 4	Resp. Partner	Fund	Donor	Budget Description	Account	Amount (in USD)
00038634	1. Strengthened role of the condominiums (or other management bodies of multi-apartment buildings) in collectively organizing and managing the heat and hot water supply services at the building level.	1.1. Improve legal and regulatory framework to strengthen the role of the condominiums (or other management bodies of multi-apartment buildings) and to allow them to present themselves as credible, legally and financially responsible counterparts for the commercial service providers.										
			x	x	x		906	62000	10003	International Consultants	71200	29,000
							906	62000	10003	Local Consultants	71300	16,000
							906	62000	10003	Travel	71600	16,000
				906	62000	10003	Contractual Services - Companies	72100	50,000			

2. Restructuring process and the capacity of the existing district heating (DH) companies to improve the efficiency of their operations is supported and built.	2.1. Finalize implementation strategy for improving the energy efficiency of the existing DH companies.	x	x	x	906	62000	10003	International Consultants	71200	31,000
					906	62000	10003	Local Consultants	71300	12,000
					906	62000	10003	Travel	71600	14,000
					906	62000	10003	Contractual Services – Companies	72100	208,000
					906	62000	10003	Equipment and Furniture	72200	3,000
					ACTIVITY 2.1. SUBTOTAL					
	2.2. Improve legal and regulatory framework to encourage and support the improved energy efficiency of the existing DH services and the commercial operation of the remaining DH companies	x	x	x	906	62000	10003	International Consultants	71200	35,000
					906	62000	10003	Local Consultants	71300	12,000
					906	62000	10003	Travel	71600	17,000
					906	62000	10003	Contractual Services – Companies	72100	28,000
					906	62000	10003	Equipment and Furniture	72200	3,000
					906	62000	10003	Supplies	72500	1,000
					906	62000	10003	Hospitality	72700	1,000
					906	62000	10003	Rental and Maintenance – Premises	73100	1,000

						906	62000	10003	Audio Visual and Printing Production Costs	74200	2,000
ACTIVITY 2.2. SUBTOTAL											100,000
2.3. Adopt a consumption based metering and billing system by the remaining DH companies.	x	x	x			906	62000	10003	International Consultants	71200	37,000
						906	62000	10003	Local Consultants	71300	12,000
						906	62000	10003	Travel	71600	14,000
						906	62000	10003	Contractual Services – Companies	72100	100,000
						906	62000	10003	Equipment and Furniture	72200	302,000
						906	62000	10003	Audio Visual and Printing Production Costs	74200	6,000
ACTIVITY 2.3. SUBTOTAL											471,000
2.4. Strengthen capacity of the management and the operating personnel of the DH companies to improve the efficiency of their operations.	x	x	x			906	62000	10003	International Consultants	71200	50,000
						906	62000	10003	Local Consultants	71300	6,000
						906	62000	10003	Travel	71600	40,000
						906	62000	10003	Contractual Services – Companies	72100	60,000
						906	62000	10003	Equipment and Furniture	72200	2,000
						906	62000	10003	Supplies	72500	1,000

						906	62000	10003	Hospitality	72700	1,000	
						906	62000	10003	Rental and Maintenance - Premises	73100	1,000	
						906	62000	10003	Professional Services	74100	5,000	
						906	62000	10003	Audio Visual and Printing Production Costs	74200	7,000	
ACTIVITY 2.4. SUBTOTAL											173,000	
COMPONENT 2 TOTAL											1,012,000	
3. Supported emerging new service providers in offering their services to the condominiums (or other management bodies of multi-apartment buildings) and structured financing for the investments needed	3.1. Improve 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, gas fired building boilers or other technological alternatives in the areas that are currently not served by or are otherwise not viable for centralized DH services.	x	x	x		906	62000	10003	International Consultants	71200	37,000	
						906	62000	10003	Local Consultants	71300	6,000	
						906	62000	10003	Travel	71600	15,000	
						906	62000	10003	Contractual Services - Companies	72100	50,000	
						906	62000	10003	Equipment and Furniture	72200	4,000	
	ACTIVITY 3.1. SUBTOTAL											112,000
		3.2. Strengthen the capacity of the emerging, new service providers and local manufacturers to develop "bankable" investment proposals, to structure financing for the projects and, as needed, to manage the commercially sustainable operation of the companies.	x	x	x		906	62000	10003	International Consultants	71200	64,000
							906	62000	10003	Local Consultants	71300	10,000
							906	62000	10003	Travel	71600	43,000
							906	62000	10003	Contractual Services - Companies	72100	180,000

					906	62000	10003	Equipment and Furniture	72200	3,000
					906	62000	10003	Supplies	72500	1,000
					906	62000	10003	Hospitality	72700	1,000
					906	62000	10003	Rental and Maintenance - Premises	73100	1,000
					906	62000	10003	Audio Visual and Printing Production Costs	74200	8,000
ACTIVITY 3.2. SUBTOTAL										311,000
					906	62000	10003	International Consultants	71200	39,000
					906	62000	10003	Local Consultants	71300	6,000
					906	62000	10003	Travel	71600	20,000
				x	906	62000	10003	Contractual Services - Companies	72100	70,000
				x	906	62000	10003	Equipment and Furniture	72200	100,000
				x	906	62000	10003	Professional Services	74100	4,000
					906	62000	10003	Audio Visual and Printing Production Costs	74200	6,000
ACTIVITY 3.3. SUBTOTAL										245,000
COMPONENT 3 TOTAL										668,000

4. Utilized 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.	4.1. Adopt a system for monitoring the GHG emission reductions of the proposed pilot/demonstration projects and evaluation of GHG removal as a result of the avoided deforestation.		x	x	x	906	62000	10003	International Consultants	71200	27,000
						906	62000	10003	Local Consultants	71300	7,000
						906	62000	10003	Travel	71600	14,000
						906	62000	10003	Contractual Services - Companies	72100	34,000
						906	62000	10003	Equipment and Furniture	72200	24,000
						906	62000	10003	Supplies	72500	500
						906	62000	10003	Hospitality	72700	1,000
						906	62000	10003	Rental and Maintenance - Premises	73100	1,000
						906	62000	10003	Audio Visual and Printing Production Costs	74200	500
						ACTIVITY 4.1. SUBTOTAL					
4.2. Adopt norms and enforcement mechanisms for supporting the sustainable use of forest wood for fuel.			x	x	x	906	62000	10003	International Consultants	71200	27,000
						906	62000	10003	Local Consultants	71300	7,000
						906	62000	10003	Travel	71600	9,000
						906	62000	10003	Contractual Services - Companies	72100	6,000
						906	62000	10003	Equipment and Furniture	72200	2,000

					906	62000	10003	Supplies	72500	1,000	
					906	62000	10003	Hospitality	72700	1,000	
					906	62000	10003	Rental and Maintenance - Premises	73100	1,000	
					906	62000	10003	Audio Visual and Printing Production Costs	74200	2,000	
ACTIVITY 4.2. SUBTOTAL										56,000	
4.3. Compile, evaluate and analyze of experiences and lessons learned under the project.					906	62000	10003	International Consultants	71200	39,000	
					906	62000	10003	Local Consultants	71300	5,000	
			x	x	x	906	62000	10003	Travel	71600	40,000
						906	62000	10003	Equipment and Furniture	72200	2,000
						906	62000	10003	Audio Visual and Printing Production Costs	74200	8,000
ACTIVITY 4.3. SUBTOTAL										94,000	
4.4. Disseminate project results, experiences and lessons learnt at the national and regional levels.					906	62000	10003	Local Consultants	71300	3,000	
					906	62000	10003	Travel	71600	45,000	
			x	x	x	906	62000	10003	Contractual Services - Companies	72100	50,000
						906	62000	10003	Equipment and Furniture	72200	2,000

						906	62000	10003	Professional Services	74100	3,000
						906	62000	10003	Audio Visual and Printing Production Costs	74200	8,000
ACTIVITY 4.4. SUBTOTAL											111,000
COMPONENT 4 TOTAL											370,000
5. Developed national capacities	5.1. Project implementation, monitoring and evaluation.					906	62000	10003	Contractual Services - Individuals	71400	180,000
						906	62000	10003	Communications and other Audio Visual Equipment	72400	60,000
		x	x	x	x	906	62000	10003	Supplies	72500	24,000
						906	62000	10003	Rental and Maintenance of Other Equipment	73400	64,000
						906	62000	10003	Miscellaneous Expenses	74500	15,000
ACTIVITY 5.1 SUBTOTAL											343,000
COMPONENT 5 TOTAL											343,000
BUDGET TOTAL											2,950,000

II b. Incremental Costs and Project Financing

18. The total costs of the project have been calculated at USD 11.720 million (USD 12.025 including the PDF B), of which the GEF will cover the incremental costs of USD 2.95 million (USD 3.160 with the PDF B).

19. The CO₂ reduction costs to the GEF based on the estimated overall replication and GHG reduction potential can be assessed at USD 0.3 per ton of CO₂ reduced over the next 20 years, while considering the first demonstration projects only the CO₂ reduction costs have been estimated at USD 4.2 per ton of CO₂.

20. The Government of Armenia will participate in the project with an in-kind contribution at the estimated value of USD 200,000 over the four years duration of the project, consisting of:

- (a) provision of office space for the Project Management Unit and the national and international experts working for the project;
- (b) participation of the Government personnel into the implementation of the project activities;
- (c) provision of full and free access to the information and data maintained by the different Governmental organizations, as required for the implementation of the project; and
- (d) provision of logistic support to the project.

21. As a follow-up to the adoption of the Urban Heating Strategy by the Government of Armenia in September 2002, the World Bank is currently preparing an IDA credit at the estimated value of USD 10 million with an objective to support economically and financially feasible heating sector investments. This credit is expected to complement the activities of this project by providing additional financing for the actual investments. During the project preparatory phase, it has been agreed with the Government of Armenia and the World Bank that this UNDP/GEF project and the ongoing WB credit preparation activities will be implemented in close co-ordination and co-operation. The USD 1,000,000 allocated for this purpose from the World Bank's Project Preparation Facility (PPF) are thus presented also as co-financing to this project.

22. Another major source of financing (accounted as leveraged financing) is the new "Programme for Improved Energy Management to Enhance Energy Security in Armenia", that has recently been approved as a part of USAID Armenia Strategy for FY2004-2008. Within this programme, USD 7.77 million is allocated for the projects in the heating sector.

23. The third source of financing that was taken into account at the time of the project brief approval is the Dutch Government funded project "Armnedheat – Development of the District Heating Industry in Armenia", with an objective to support the commercial provision of decentralized heat and hot water supply services by: 1) supporting the local manufacturing of boilers through the establishment of a joint venture between the local and the Dutch partners; 2) implementing a pilot project in one building block based on a mini-DH grid; and 3) training the local engineers and sales staff on design, construction and sale of heat supply units and boiler houses. The project was started in 2002 and is expected to be finalized in the end of 2003.

24. In addition to the above, the Government of Japan has recently approved a Armenia Utility Restructuring Project Grant no.TF051647, in amount \$500,000 provided for all communal services and which thus can also be considered as a possible source of leveraged financing to the project. Additional contributions are expected from the households and private service providers, who would be required to put up their own funds to be eligible for receiving financing for their projects, the national gas company for the natural gas distribution infrastructure upgrade, the financial sector, and the government and/or municipalities that may co-finance some components of the project and contribute to the social support mechanism.

PART III Project Management Arrangements

Project Implementation Arrangements

25. The project will be implemented in close co-operation with the other ongoing activities in Armenia, in particular the WB/IDA funded “Urban Heating Project”, the USAID funded “Energy Efficiency and Renewable Energy Sources” Project, the Government of the Netherlands supported “Industrial Development of the District Heating Industry in Armenia” and the activities planned to be funded by the USAID over the next 4 years to support the heating sector development in Armenia. The agreed division of responsibilities and funding is presented in further detail in sections “Incremental Costs and Project Financing” and “Stakeholder Participation and Co-ordination with Other Activities and Donors”.

26. The National Executing Agency of the project will be the Ministry of Nature Protection, which will be responsible for the overall management and supervision of the project and will ensure harmony between the project, its outcomes and general country environmental policy and priorities.

The authorized UNFCCC Focal Point will coordinate and be responsible for implementation of the full-size project as long as the Ministry of Nature Protection RA with the support of the UNDP form a Climate Change Centre to act as an institutional unit for implementation of the UN Framework Convention on Climate Change.

The National Executing Agency of the project will appoint a Project Coordinator, who will assume the overall responsibilities for project implementation as a representative of the Ministry, and will be in charge of project management ensuring its conformity and synergy with the provisions of UN Framework Convention on Climate Change and its decisions.. The Project Coordinator will represent the Ministry of Nature Protection also in WB/IDA credit management board.

UNDP with the Ministry of Nature Protection will organize the selection of subcontractors according to the UNDP rules and procedures. For contracts exceeding 30,000 US\$, tender results will be approved by Procurement Committee with the participation of the Ministry’s representative on consensus principle.

27. A project team will be established and recruited on a competitive basis for project implementation. The project team will be managed by the National Project Manager (PM), who will be accountable to the Project Coordinator and UNDP for planning, implementation quality, timeliness and effectiveness of the activities carried out and the proper use of funds. The recruitment of Project Manager will be carried out jointly by the Ministry of Nature Protection and UNDP according to the UNDP procedures and based on consensus principle. In order to successfully implement the project activities, it is preferable and advantageous to use the accumulated capacities, including personnel, experience and information, established, trained and strengthened during the preparatory phase (PDF B). Such approach will ensure smooth start up and implementation of the project. The Project Manager will be supported by a part time International Technical Adviser (ITA) as well as by local support staff to assist the PM in the overall project management, including logistic support, circulation of discussion papers and draft reports, raising public awareness on project activities, coordinating and monitoring the work of the consultants and providing other support needed.

28. The Project Steering Committee (PSC) will be responsible for policy input, advice and co-ordination of the project with the other ongoing activities (Annex C¹). The PSC will be composed of representatives of the Ministry of Nature Protection as the project executing agency and UNDP as the implementing agency and it is proposed that the representatives of

the following institutions: Ministry of Finance and Economy, Ministry of Energy, Energy Regulating Commission, Ministry for Coordination of Territorial Administration and Infrastructure Operations, Ministry of Urban Planning, State Committee of Real Estate Cadastre under RA Government, Participating Municipalities, Department for Standardization, Metrology and Certification under the Government of RA, representatives of international donor agencies and NGOs will be also included.

29. An organizational chart of the project implementation arrangements is presented in Annex C³.

30. The representatives of the universities and other research/educational institutions as well as the NGOs are foreseen to be actively involved in the implementation of project activities, especially as it concerns the activities dealing with the public awareness raising and other educational and training activities, research related to the technical aspects of the technologies to be promoted as well as monitoring and evaluation of the overall results of the project.

Replication

31. The replication strategy of the project is based on the following project design features:

- 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;
- close 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.

32. It is evident that the effective replication of project activities will require a combination of policy related changes as well as effective dissemination of the project results and lessons learned, thereby providing applicable examples for the implementation of the things in practice. Often some results at the practical side are needed, before the necessary changes at the policy level can be effectively promoted and implemented. The project will facilitate the continuing contacts and co-operation between the different stakeholder groups by organizing seminars, workshops and other public events, thereby bringing the project proponents, the policy makers and the potential investors / other donors together.

33. Based on the estimates made in 1999, there are some 1.22 million people living in multi-store apartment buildings in urban areas in Armenia, with the total heated area of 14.4 million square meters and annual heat consumption of 4.5 PJ (3.65 PJ for heating and 0.85 PJ for hot water). This is some 25 % of the calculated, “normative” heat demand to keep the minimum of 18°C inside temperature in all the rooms and buildings throughout the year and to supply the tenants with the average of 55 to 60 liters of hot water per day.

³ Role, duties and responsibilities of other Ministries and agencies/organizations, if applicable, will be further defined in the course of the project commencement phase and agreed with the key stakeholders defined by the project document hereunder.

34. For estimating the replication potential of the project, it has been assumed that along with the general economic development of the country and despite the possible demand side energy efficiency measures that can be implemented within the buildings, the heat demand will gradually increase and double over the 20 years, thereby being some 9 PJ in 2025. In terms of heat sources, the current inefficient use of the available primary energy resources will continue, unless the people will have access to alternative, more environmentally-friendly and at the same time affordable energy supply services. In Table 1, the replication and the corresponding CO₂ reduction potential has been estimated for some selected Armenian cities based on the assumptions that as a follow up of the project activities over the next 20 years:

- the energy efficiency of the existing multi-store apartment building stock can be gradually improved with 30 % from the current level with relatively simple, low cost demand side energy efficiency investments;
- the energy efficiency of those centralized DH systems that prevail can be gradually increased from the current 50% up to 75%, thereby corresponding to the western standards; and
- the more efficient use of gas can be encouraged otherwise in centralized or decentralized heat only or co-generation applications, thereby substituting the current use of electricity (which based on the power generation efficiency of the existing power plants in Armenia has, in average, only 25% overall efficiency from gas to heat) and the excessive use of wood fuel for heating purposes.

35. Based on the assumptions above and by facilitating an effective replication of the project activities in the urban apartment buildings across the country, the overall GHG reduction potential over the next 20 years has been estimated at 9.6 million tons of CO₂.

36. Replication will increase significantly due to efforts to disseminate the project's approaches in other CIS countries. Therefore, the project activities will be designed to have a regional impact where possible. For example, training materials developed for the project will be made available to other countries with similar training needs. The project can also invite observers from other countries in the region to key meetings and training, and project staff will attend key meetings as necessary on the Caucasus or CIS level that will give them access to a regional audience. Furthermore, the project will identify key stakeholders from other countries in the region and use them as information points for distributing ideas and templates for policies and financing (these stakeholders will include public officials, private sector entrepreneurs, NGOs, and other donors). Stakeholders may also be involved in a regional meeting to review the progress of the investment and financing components, and they may be included in a study tour to the project sites.

Table 1 - Characteristics of Selected Cities for Replicating the Project Activities in Multi-Apartment Residential Buildings in Armenia

The figures provided in the table below represent the DH situation in 2001. This data can also be used as indicative figures for determining the market potential for the different options (centralized vs. decentralized) over the short term: While the continuation of the DH services is likely to be more feasible in the areas in which they are already operating, the provision of decentralized services could begin in the areas that fall under the category of “not reconnectable”. The areas that are not currently connected, but which would be technically reconnectable, fall somewhere between. Ultimately, the final market share of each system will materialize through customer demand, depending on how successfully the companies in each area will be in developing, managing and marketing their services.

City	Number of Residents	Annual Heat Demand: Normative/ Current (TJ)	Heating Characteristics ^(a)		Estimated CO ₂ Reduction Potential Over Next 20 Years (Mt of CO ₂)
			Source of Heating Needs in 1999	District Heating in 2001	
Yerevan	1,247,200 (official) 1,050,000 (estimated)	9480 / 2297 (24%)	Electricity 56% DH 31% Wood Fuel 11% Other 2%	In operation 25% Tech. reconnectable 53% Not reconnectable 22%	5.7
Charentsavan	35,800 (official) 23,300 (estimated)	340 / 102 (30%)	Electricity 37% DH 38% Wood Fuel 16% Other 9%	In operation 16% Tech. Reconnectable 84% Not reconnectable 0%	0.20
Gyumri	210,900 (official) 160,000 (estimated)	781 / 357 (46%)	Electricity 14% DH 81% Wood Fuel 4% Other 1%	In operation 45% Tech. Reconnectable 1% Not reconnectable 54%	0.54
Jermuk	10,300 (official) 7,700 (estimated)	88 / 59 (67%)	Electricity 5% DH 94% Wood Fuel 1% Other 0%	In operation 98% Tech. Reconnectable 2% Not reconnectable 0%	0.08
Vanadzor	172,700 (official) 138,200 (estimated)	944	Electricity 46% DH 0% Wood Fuel 38% Other 16%		
Razdan	63,900 (official) 51,100 (estimated)	560	DH covers 62% from the normative heat demand ^(b)		
Sevan	27,100 (official) 21,100 (estimated)	303	DH covers 71.2 % from the normative heat demand ^(b)		
Abovian	61,100 (official) 48,900 (estimated)	686	DH covers 20.6 % from the normative heat demand ^(b)		

^(a) Source: UNDP/GEF PDF B and the Urban Heating Strategy.

^(b) The remaining demand is covered by the mixed consumption of electricity, wood and other sources pro-rate more or less same as is currently practiced in the Republic, no specific data available for these cities.

Risks and Sustainability

37. One of the main risks of the project is that the structural reforms requested by the Decree “On Reforms in Urban Heating System of the Republic of Armenia” will not proceed as planned or they will be considerably delayed, which would largely weaken the basis also for the planned technical assistance and pilot investment activities. This risk is associated with the overall policy framework in Armenia. To date, the Government has demonstrated serious commitments to advance the objectives of the Decree. For instance in May 2002 the new Law on Condominiums was passed and the preparation of the WB/IDA credit has started with a USD 1 million initial investment allocated for project preparation. Therefore, it is expected that the Government will continue to introduce the structural reforms as planned and the pace of these reforms will be monitored throughout the course of the project. The project is also going to promote these reforms by involving the key policy makers in the supervision and monitoring of the project activities from the very beginning.

38. Tariff setting, in addition to billing practices, requires continued reform so that consumers understand what they are effectively paying for. The risk that substantial tariff reform will not be carried out is mitigated through the design of the parallel World Bank component, where technical assistance is targeted at regulatory framework changes including the application of improved tariff-setting methodology for heating options.

39. Another risk to the project’s success is associated with the low solvency of the population thereby posing specific challenges for justifying the financial feasibility of the investments to be made and the price of the services to be provided. The project is designed to overcome this barrier by determining the technologies and measures to be promoted on the basis of the expected payment capacity of the majority of the population. This is in line with the Government’s Urban Heating Strategy, which focuses strongly on the issues of affordability. Development of a social support scheme for the most needy families is intended to assist these families in covering their heating expenses and will be a part of the planned WB Urban Heating Project.

40. Based on the surveys conducted under the WB Urban Heating Project, households currently spend an estimated US\$ 30 to \$50 on heating per household annually. The survey responses on willingness-to-pay for improved heat supply ranged from \$50 to \$100 annually. These latter figures basically set the framework for the development of the heating systems for the next few years with the assumption that additional support can be provided to the most vulnerable groups of the population through a specific social support scheme. In terms of the investments, the figures above call for the gradual development of the heat supply services, in which the capital investments made should correspond to the affordable level of heat demand. For instance, in the decentralized alternative, the condominiums or the private heat suppliers may at the initial stage invest in a smaller boiler and simpler system and, once the general socioeconomic conditions of the country and consequently the people’s ability to pay for heat will improve, the system can be upgraded to reflect the increasing demand.

41. Thirdly, given the past history of state owned property, there is a lack of experience and tradition in Armenia and in other CIS countries on the collective management of the buildings by tenants, which is posing cultural and social barriers to the effective establishment and operation of the condominiums. The project tries to overcome this risk, among others, by targeted public awareness and educational activities in order to train the tenants on the basic principles and operational characteristics of the condominiums and by facilitating the implementation of selected demonstration projects in order to provide “hands-on” experience on the benefits that the properly managed condominiums can bring to the tenants.

42. Finally, there is a risk associated with the development of the financial market in Armenia in general, which currently is characterized by high interest rates, short maturity of the loans and high collateral requirements. While the situation is not likely to change drastically over the next few years, it is expected that in the longer term, and along with the

general economic development of the country, the financial market will also develop and more medium to long-term maturity loans can be made available at reasonable interest rate. To cover the eventual gap between the general financial market development in Armenia and the resources available through the WB/IDA and, as applicable, USAID under the Pilot Financing Scheme, the project will over its lifetime actively look for other partners and possible funding sources that could contribute to the financing of new investments in the heating sector either in concessional or non-concessional terms.

43. Ultimately, increased financing will be attracted from the private sector to finance heating sector projects on a fully commercial basis. While this will not entirely neglect the need for public support, it would seek its retargeting; for instance, for the establishment of specific social support as discussed before or for the eventual support needed for the long term infrastructure investments such as the gas or the DH network to provide the basis for the operation of commercial service providers. The total amount of the direct and indirect subsidies that the Government is currently spending to support the existing heating system have been estimated at US\$ 10-12 million annually, so one of the project goals is to retarget at least part of these resources for the actual improvement of the heating infrastructure rather than continuing to support the existing inefficient systems. For the improvement of the gas network, in particular, increasing financing would also be expected from the gas companies with the long term strategic goals and vision to participate in the development of the energy sector in Armenia.

44. Sustainability is addressed, directly and indirectly, throughout the design of this project. Activities that indirectly support the sustainability of the improvements to the energy efficiency of heat and hot water supply include: raising of public awareness and education; building of local capacity through training and provision of advice on technical, financial and legal matters; and development of training strategies. The issue of financial sustainability is addressed through the development of a consumption-based billing system. Overall sustainability of the initiatives is further supported through continued legal and regulatory reform to support the heat and hot water sector.

Monitoring, Evaluation and Dissemination of Results

45. The Executing Agency and UNDP will supervise and monitor the overall implementation of the project. For this purpose, the Project Manager shall regularly report to the National Project Director and UNDP Resident Representative on the project's progress and its various sub-components. Likewise, the subcontractors shall report regularly to the Project Manager as stipulated in their Terms of Reference. The progress and the outputs of the project will be monitored and evaluated against its stated objectives and outputs, by using, among others, the indicators presented in project's "Results Framework", the "Project Planning Matrix" and the "Monitoring and Evaluation Plan" Should the project or one of its components not proceed satisfactorily (as indicated by the PIR/APR), UNDP reserves a right to terminate its assistance for the project as a whole or for the component under consideration. The remaining funds will be returned to the GEF or reallocated for other purposes, subject to the agreement reached with the UNDP/GEF and/or the GEF Secretariat.

46. Development of effective feedback mechanisms to guide the overall project implementation belongs to one of the main activities of the project under the M&E component. As needed, the experiences and lessons learnt can be used for redefining some of the project activities and approaches and, in particular, in designing the project follow-up and replication activities. Information on the project's progress and results will be updated regularly and made available to anyone interested, for instance through the Government climate change homepage (www.nature.am), through the specific project site in the Internet

to be established during the project implementation and, as applicable, through regular newsletters. A specific emphasis will also be placed on promoting the replication of the project activities at the regional level by disseminating the experiences and lessons learnt through regional workshops and other regional outreach activities.

47. The overall progress of the project will be monitored against its agreed work plan and performance indicators. Should the necessary preconditions not be in place for further continuation of the project activities or the envisioned outputs and objectives are otherwise not likely to be met, the UNDP/GEF reserves a right to terminate its assistance. These criteria will include the demonstrated commitment of the Government of Armenia to continue to introduce changes in the institutional, legal and regulatory framework that support the investments in energy efficiency and environmentally more friendly heating practices as well as the materialization of the envisioned co-financing of the project, in particular the WB/IDA loan.

48. The Ministry of Nature Protection will carry the main responsibility in monitoring the GHG emissions reductions achieved during the project. The demonstration projects will be monitored and the results reported by developing and introducing a specific Monitoring and Verification Protocol (MVP). The experiences and lessons learnt for developing similar MVPs for JI and CDM projects can also be utilized in that respect.

49. A tripartite committee, including the Government, UNDP and UNDP/GEF representative will review the project at least once every year. The first such meeting is to take place within the first 12 months of the start of the project's full implementation. The Project Manager shall prepare and submit to each tripartite review meeting a Harmonized Annual Project Report (APR)/Project Implementation Review report (PIR). The Annual PIR prepared by the UNDP CO is intended for submission to the GEF. Additional reviews and progress reports may be requested during the project and the project staff shall support the preparation of these reviews, including Secretariat Managed Project Reviews (SMPRs), as they may rise..

50. The project will also be subject to an independent midterm and final evaluation undertaken by an independent international expert, or team of experts, as applicable. The final project results, experiences and lessons learnt will be compiled into the Project Final Report that will publish and disseminated through the applicable channels. A detailed monitoring and evaluation plan of the project is presented in Annex E.

51. The Government will provide UNDP with certified periodic financial statements relating to the status of UNDP/GEF funds, including an annual audit of these financial statements, according to the procedures set out in relevant documents. The audit will be conducted by the legally recognized auditor of the Government, or by a commercial auditor engaged by the Government. The executing agency is responsible for meeting the costs of audit. In exceptional cases, however, the UNDP Resident Representative may approve the use of project funds for audit costs, if the audit is carried out by a commercial auditor.

Stakeholder Participation and Co-ordination with Other Activities and Donors

52. The project is a result of a process that was started under the PDF B titled "Removing Barriers to Energy Efficiency in Municipal Heat and Hot Water Supply". The project preparatory activities were implemented in close co-operation with different ministries responsible for the heating sector development as well as with the other donors supporting or planning to support the Government in this task. The modalities for stakeholder participation have included direct consultations, seminars as well as meetings of the Project Steering Committee.

53. There are several donors that are currently active in Armenia and are increasingly recognizing the heating sector as one of their priority areas. A brief summary on the other ongoing or planned activities in the heating sector in Armenia and the envisioned co-operation and co-financing arrangements with the proposed GEF project are presented below.

54. The UNDP/GEF has been active in Armenia since 1995 starting with the enabling activity project to support Armenia to prepare its first national communication. Based on the studies and consultations conducted during the enabling activity project, the improvement of energy efficiency of the municipal heat and hot water supply was identified as one of the priority areas to be explored in further detail for facilitating the actual reduction of greenhouse gas emissions in Armenia. As a follow up, the Government of Armenia requested PDF B resources through UNDP/GEF for the development of a project for “Removing Barriers to Energy Efficiency in Municipal Heat and Hot Water Supply”. The implementation of the PDF B was started in 1999.

55. The World Bank initiated the preparation of the Urban Heating Strategy (UHS) in 2001 under the leadership of the Ministry of Finance and Economy. A variety of initiatives and funding sources were combined to help to prepare this strategy, including EU/TACIS, the Energy Sector Management Assistance Program (ESMAP) sponsored jointly by WB and UNDP, and a Japanese Government grant under the World Bank administered Policy and Human Resource Development (PHRD) program. The preparation process also benefited from other ongoing and past studies, including those prepared under the UNDP/GEF supported PDF B and the USAID. Close co-operation among the WB and the UNDP/GEF project teams and the other key stakeholders has marked the preparation of the Urban Heating Strategy. The Urban Heating Strategy was formally adopted by the Government of Armenia on September 5, 2002 (Decree 1384N) including a request for the preparation of an investment program in co-operation with the World Bank/IDA and further negotiations with the UNDP/GEF on the possibilities to provide technical assistance for addressing the energy efficiency and environment related aspects of the Urban Heating Strategy. The total size of the WB/IDA credit is expected to be in the range of USD 10 million, including a USD 1 million Project Preparation Facility that was launched in early 2003 to advance the project preparation. Under PPF the number of pilot projects are initiated, which will be completed by the end of 2004.

56. As a result of consultations in 2002-2003, between the WB staff, WB PIU team, UNDP and Ministry of Nature Protection it was agreed on parallel activities during the implementation of GEF FSP and WB loan. The loan will become operational from 2005 and is envisaged to provide credits to condominiums and private companies involved in the heat supply rehabilitation. The technical assistance needs of these activities will be partly covered by the GEF/UNDP project (advisory services through establishment and institutional strengthening of the Advisory Center, improving legislative and regulatory framework, training, support for the preparation of bankable projects, creating enabling environment for private sector involvement in heat supply rehabilitation, etc.).

57. Following up the in-country consultations and the review of the studies made, including those conducted under the UNDP/GEF PDF B phase, the Government of Netherlands approved in early 2002 a PSO grant for the project “Armnedheat – Industrial Development of the District Heating in Armenia”. The objective of the project is to support the local manufacturing capacity for the production of energy efficient district heating equipment and small boilers through the joint venture established between an Armenian and Dutch boiler producer. The project will directly contribute to reaching the objectives of this project by increasing the domestic production of high efficiency gas boilers and lowering also their costs.

58. The USAID contracted Advanced Engineering Associates International to implement Armenia Energy Efficiency, Demand-side Management and Renewable Energy Program (Efficiency and Renewable Energy Program (EREP)). The heating component of the program included assistance for the preparation of the Urban Heating Strategy for Armenia and implementation of seven pilot projects on the rehabilitation of heating systems in municipal and residential sites: installation of high efficiency boilers, gas-fired heaters, and weatherization work. Projects are being implemented in multi-apartment buildings in Yerevan and Guimry, Yerevan School #55, Malatia Medical Center, Policlinic #1 in Vanadzor and Pedagogical University.

59. The financing program of the USAID for the FY2004-2008 includes the "Programme for Improved Energy Management (IEM) to Enhance Energy Security in Armenia". Within this program, the resources allocated for the heating sector development are USD 7.77 million.. The purpose of the program is to provide technical assistance to the Republic of Armenia in extending reform and restructuring to improve the efficiency of resource use in the energy and heat supply sectors. This focus is based in part on these sectors' continued need for improved transparency and commercial motivation in governance in order to reduce the opportunities for corruption and to improve the quality of public services delivered to customers. It is also motivated by the compelling need to manage and use Armenia's scarce energy resources with greater efficiency and in an environmentally sustainable way. The program will provide technical assistance, training, and commodities to: a) selected private sector counterparts, including Energy Service Companies (ESCOs), financial sector entities supporting energy efficiency and renewable energy investment, ArmEINet and ArmRosGazprom, Condominium Associations, NGO's and other civil society stakeholder organizations; and b) key Government of Armenia (GOAM) counterparts, including the Ministries of Energy (MOE), of Finance and Economy (MFE), and of Urban Development (MUD), the Armenian Energy Regulatory Commission (AERC), and GOAM-owned energy sector companies, such as ArmTrans and ArmEnerg and its functional centers.

60. Through the partnerships created during the project preparatory phase, the project will be implemented in close co-operation with the activities of the other donors, in particular the World Bank/IDA funded Urban Heating Project, the Government of Netherlands funded Industrial District Heating Development project and the USAID supported IEM programme. While UNDP/GEF funding is primarily requested for capacity building and other technical assistance type of activities, the establishment of a pilot financing mechanism to support the actual investments is primarily covered by the mentioned WB/IDA project and eventually to some extent also by the USAID. The Dutch supported "Industrial Development" project will complement the package by promoting the local manufacturing of energy efficient heating equipment (through Dutch-Armenian joint ventures).

61. The co-ordination of the project activities with the WB/IDA funded Urban Heating Project, is going to take place, as applicable, through the WB/IDA Credit Management Board, in which the UNDP/GEF National Project Director will have a seat as well as through regular consultations between the UNDP/GEF project management team and the WB/IDA project implementation unit. This co-operation was started already during the preparatory phases of both projects and has worked without the problems. With the other donor-financed activities, in particular those of USAID and the Government of Netherlands, the co-ordination will mainly take place through the regular consultations between the project management teams. The UNDP/GEF Project Steering Committee (PSC) will serve as an additional body to ensure proper co-ordination with the other ongoing activities in Armenia. Beside the local institutions, the PSC will have representatives from the key donors.

Part IV Legal Context

62. This Project Document shall be the instrument referred to as such in Article I of the Standard Basic Assistance Agreement between the Government of Armenia and the United Nations Development Programme, signed by the parties on June 10th, 1993. The host country implementing agency shall, for the purpose of the Standard Basic Assistance Agreement, refer to the government co-operating agency described in that Agreement.

63. UNDP acts in this Project as the Implementing Agency of the Global Environment Facility (GEF), and all rights and privileges pertaining to UNDP as per the terms of the SBAA shall be extended *mutatis mutandis* to GEF.

64. The UNDP Resident Representative in Armenia is authorized to effect in writing the following types of revision to this Project Document, provided that he/she has verified the agreement thereto by GEF Unit and is assured that the other signatories to the Project Document have no objection to the proposed changes:

- Revision of, or addition to, any of the annexes to the Project Document;
- Revisions which do not involve significant changes in the immediate objectives, outputs or activities of the project, but are caused by the rearrangement of the inputs already agreed to or by cost increases due to inflation;
 - a) Mandatory annual revisions which re-phase the delivery of agreed project inputs or increased expert or other costs due to inflation or take into account agency expenditure flexibility; and
 - b) Inclusion of additional annexes and attachments only as set out here in this Project Document.

PROJECT BUDGET AND RESOURCE FRAMEWORK

Proj. ID	Expected Output	Key Activity	Timeframe				Budget															
			Yr1	Yr2	Yr3	Yr4	Resp. Partner	Fund	Donor	Budget Description	Account	Amount (in USD)	2005	2006	2007	2008						
00038634	1. Strengthened role of the condominiums (or other management bodies of multi-apartment buildings) in collectively organizing and managing the heat and hot water supply services at the building level.	1.1. Improve legal and regulatory framework to strengthen the role of the condominiums (or other management bodies of multi-apartment buildings) and to allow them to present themselves as credible, legally and financially responsible counterparts for the commercial service providers.	x	x	x		906	62000	10003	International Consultants	71200	29,000	0	15,000	14,000	0						
							906	62000	10003	Local Consultants	71300	16,000	3,000	10,000	3,000	0						
							906	62000	10003	Travel	71600	16,000	5,000	6,000	5,000	0						
							906	62000	10003	Contractual Services - Companies	72100	50,000	10,000	20,000	20,000	0						
							906	62000	10003	Equipment and Furniture	72200	5,000	3,000	1,000	1,000	0						
							906	62000	10003	Supplies	72500	1,500	500	500	500	0						
							906	62000	10003	Hospitality	72700	2,500	1,000	1,000	500	0						
							906	62000	10003	Rental and Maintenance - Premises	73100	2,000	500	1,000	500	0						
							906	62000	10003	Audio Visual and Printing Production Costs	74200	3,000	1,000	1,000	1,000	0						
							ACTIVITY 1.1. SUBTOTAL											125,000	24,000	55,500	45,500	0
								1.2. Strengthen the capacity of the condominiums (or other management bodies of multi-apartment buildings) to manage their operations and to organize the heat and hot water supply					906	62000	10003	International Consultants	71200	70,000	20,000	30,000	20,000	0
906	62000	10003	Local Consultants	71300	20,000	7,000							7,000	6,000	0							
906	62000	10003	Travel	71600	17,000	6,000							6,000	5,000	0							

	services collectively at the building level.					906	62000	10003	Contractual Services - Companies	72100	140,000	40,000	50,000	50,000	0
						906	62000	10003	Equipment and Furniture	72200	165,000	45,000	60,000	60,000	0
						906	62000	10003	Professional Services	74100	4,000	1,000	1,000	2,000	0
						906	62000	10003	Audio Visual and Printing Production Costs	74200	16,000	4,000	6,000	6,000	0
						ACTIVITY 1.2. SUBTOTAL									
COMPONENT 1 TOTAL											557,000	147,000	215,500	194,500	0
2. Restructuring process and the capacity of the existing district heating (DH) companies to improve the efficiency of their operations is supported and built.	2.1. Finalize implementation strategy for improving the energy efficiency of the existing DH companies.	x	x	x		906	62000	10003	International Consultants	71200	31,000	20,000	11,000	0	0
						906	62000	10003	Local Consultants	71300	12,000	4,000	4,000	4,000	0
						906	62000	10003	Travel	71600	14,000	6,000	6,000	2,000	0
						906	62000	10003	Contractual Services - Companies	72100	208,000	50,000	85,000	73,000	0
						906	62000	10003	Equipment and Furniture	72200	3,000	2,000	500	500	0
						ACTIVITY 2.1. SUBTOTAL									
	2.2. Improve legal and regulatory framework to encourage and support the improved energy efficiency of the existing DH services and the commercial operation of the remaining DH companies	x	x	x		906	62000	10003	International Consultants	71200	35,000	10,000	15,000	10,000	0
						906	62000	10003	Local Consultants	71300	12,000	4,000	4,000	4,000	0
						906	62000	10003	Travel	71600	17,000	7,000	6,000	4,000	0
						906	62000	10003	Contractual Services - Companies	72100	28,000	10,000	10,000	8,000	0
						906	62000	10003	Equipment and Furniture	72200	3,000	1,000	1,000	1,000	0

					906	62000	10003	Supplies	72500	1,000	400	300	300	0
					906	62000	10003	Hospitality	72700	1,000	300	400	300	0
					906	62000	10003	Rental and Maintenance - Premises	73100	1,000	300	400	300	0
					906	62000	10003	Audio Visual and Printing Production Costs	74200	2,000	0	1,000	1,000	0
ACTIVITY 2.2. SUBTOTAL										100,000	33,000	38,100	28,900	0
2.3. Adopt a consumption based metering and billing system by the remaining DH companies.					906	62000	10003	International Consultants	71200	37,000	15,000	15,000	7,000	0
					906	62000	10003	Local Consultants	71300	12,000	4,000	4,000	4,000	0
					906	62000	10003	Travel	71600	14,000	6,000	6,000	2,000	0
		x	x	x	906	62000	10003	Contractual Services - Companies	72100	100,000	20,000	50,000	30,000	0
					906	62000	10003	Equipment and Furniture	72200	302,000	52,000	150,000	100,000	0
					906	62000	10003	Audio Visual and Printing Production Costs	74200	6,000	1,000	2,500	2,500	0
ACTIVITY 2.3. SUBTOTAL										471,000	98,000	227,500	145,500	0
2.4. Strengthen capacity of the management and the operating personnel of the DH companies to improve the efficiency of their operations.					906	62000	10003	International Consultants	71200	50,000	25,000	15,000	10,000	0
					906	62000	10003	Local Consultants	71300	6,000	2,000	2,000	2,000	0
					906	62000	10003	Travel	71600	40,000	16,000	16,000	8,000	0
		x	x	x	906	62000	10003	Contractual Services - Companies	72100	60,000	15,000	25,000	20,000	0
					906	62000	10003	Equipment and Furniture	72200	2,000	1,000	500	500	0

						906	62000	10003	Supplies	72500	1,000	300	400	300	0	
						906	62000	10003	Hospitality	72700	1,000	0	500	500	0	
						906	62000	10003	Rental and Maintenance - Premises	73100	1,000	0	500	500	0	
						906	62000	10003	Professional Services	74100	5,000	0	5,000	0	0	
						906	62000	10003	Audio Visual and Printing Production Costs	74200	7,000	1,000	3,000	3,000	0	
ACTIVITY 2.4. SUBTOTAL											173,000	60,300	67,900	44,800	0	
COMPONENT 2 TOTAL											1,012,000	273,300	440,000	298,700	0	
3. Supported emerging new service providers in offering their services to the condominiums (or other management bodies of multi-apartment buildings) and structured financing for the investments needed	3.1. Improve 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, gas fired building boilers or other technological alternatives in the areas that are currently not served by or are otherwise not viable for centralized DH services.	x	x	x		906	62000	10003	International Consultants	71200	37,000	15,000	15,000	7,000	0	
						906	62000	10003	Local Consultants	71300	6,000	2,000	2,000	2,000	0	
						906	62000	10003	Travel	71600	15,000	5,000	5,000	5,000	0	
						906	62000	10003	Contractual Services - Companies	72100	50,000	15,000	20,000	15,000	0	
						906	62000	10003	Equipment and Furniture	72200	4,000	2,000	1,000	1,000	0	
	ACTIVITY 3.1. SUBTOTAL											112,000	39,000	43,000	30,000	0
	3.2. Strengthen the capacity of the emerging, new service providers and local manufacturers to develop "bankable" investment proposals, to structure financing for the projects and, as needed, to manage the commercially sustainable operation of the companies.	x	x	x			906	62000	10003	International Consultants	71200	64,000	24,000	20,000	20,000	0
							906	62000	10003	Local Consultants	71300	10,000	2,000	4,000	4,000	0
							906	62000	10003	Travel	71600	43,000	15,000	15,000	13,000	0
							906	62000	10003	Contractual Services - Companies	72100	180,000	60,000	60,000	60,000	0
906							62000	10003	Equipment and Furniture	72200	3,000	1,000	1,000	1,000	0	

						906	62000	10003	Supplies	72500	1,000	500	500	0	0
						906	62000	10003	Hospitality	72700	1,000	500	500	0	0
						906	62000	10003	Rental and Maintenance - Premises	73100	1,000	500	500	0	0
						906	62000	10003	Audio Visual and Printing Production Costs	74200	8,000	2,000	3,000	3,000	0
ACTIVITY 3.2. SUBTOTAL											311,000	105,500	104,500	101,000	0
3.3. Adopt certification system for qualified service and equipment providers.						906	62000	10003	International Consultants	71200	39,000	0	20,000	19,000	0
						906	62000	10003	Local Consultants	71300	6,000	1,000	3,000	2,000	0
						906	62000	10003	Travel	71600	20,000	3,000	9,000	8,000	0
						906	62000	10003	Contractual Services - Companies	72100	70,000	10,000	30,000	30,000	0
						906	62000	10003	Equipment and Furniture	72200	100,000	20,000	40,000	40,000	0
						906	62000	10003	Professional Services	74100	4,000	0	0	4,000	0
						906	62000	10003	Audio Visual and Printing Production Costs	74200	6,000	1,000	3,000	2,000	0
ACTIVITY 3.3. SUBTOTAL											245,000	35,000	105,000	105,000	0
COMPONENT 3 TOTAL											668,000	179,500	252,500	236,000	0
4. Utilized results, experiences and lessons learnt for advancing the sustainable development of the heat and hot water	4.1. Adopt a system for monitoring the GHG emission reductions of the proposed pilot/demonstration projects and evaluation of GHG removal as a result of the avoided deforestation.					906	62000	10003	International Consultants	71200	27,000	0	0	15,000	12,000
						906	62000	10003	Local Consultants	71300	7,000	0	3,000	3,000	1,000
						906	62000	10003	Travel	71600	14,000	0	4,000	5,000	5,000

services in Armenia with a specific emphasis on the GHG reduction aspects.					906	62000	10003	Contractual Services - Companies	72100	34,000	0	10,000	14,000	10,000	
					906	62000	10003	Equipment and Furniture	72200	24,000	0	6,000	10,000	8,000	
					906	62000	10003	Supplies	72500	500	0	100	200	200	
					906	62000	10003	Hospitality	72700	1,000	0	0	500	500	
					906	62000	10003	Rental and Maintenance - Premises	73100	1,000	0	300	300	400	
					906	62000	10003	Audio Visual and Printing Production Costs	74200	500	0	0	500	0	
										109,000	0	23,400	48,500	37,100	
	ACTIVITY 4.1. SUBTOTAL														
4.2. Adopt norms and enforcement mechanisms for supporting the sustainable use of forest wood for fuel.					906	62000	10003	International Consultants	71200	27,000	0	0	17,000	10,000	
					906	62000	10003	Local Consultants	71300	7,000	0	1,000	3,000	3,000	
					906	62000	10003	Travel	71600	9,000	0	2,000	5,000	2,000	
					906	62000	10003	Contractual Services - Companies	72100	6,000	0	0	3,000	3,000	
			x	x	x	906	62000	10003	Equipment and Furniture	72200	2,000	0	1,000	1,000	0
					906	62000	10003	Supplies	72500	1,000	0	500	0	500	
					906	62000	10003	Hospitality	72700	1,000	0	0	500	500	
					906	62000	10003	Rental and Maintenance - Premises	73100	1,000	0	200	400	400	

					906	62000	10003	Audio Visual and Printing Production Costs	74200	2,000	0	0	1,000	1,000	
										56,000	0	4,700	30,900	20,400	
ACTIVITY 4.2. SUBTOTAL															
4.3. Compile, evaluate and analyze of experiences and lessons learned under the project.					906	62000	10003	International Consultants	71200	39,000	0	0	20,000	19,000	
					906	62000	10003	Local Consultants	71300	5,000	0	0	2,500	2,500	
					906	62000	10003	Travel	71600	40,000	0	0	20,000	20,000	
				x	x	906	62000	10003	Equipment and Furniture	72200	2,000	0	0	1,500	500
						906	62000	10003	Audio Visual and Printing Production Costs	74200	8,000	0	0	5,000	3,000
											94,000	0	0	49,000	45,000
ACTIVITY 4.3. SUBTOTAL															
4.4. Disseminate project results, experiences and lessons learnt at the national and regional levels.					906	62000	10003	Local Consultants	71300	3,000	0	0	2,000	1,000	
					906	62000	10003	Travel	71600	45,000	0	0	30,000	15,000	
					906	62000	10003	Contractual Services - Companies	72100	50,000	0	0	30,000	20,000	
				x	x	906	62000	10003	Equipment and Furniture	72200	2,000	0	0	1,000	1,000
						906	62000	10003	Professional Services	74100	3,000	0	0	0	3,000
						906	62000	10003	Audio Visual and Printing Production Costs	74200	8,000	0	0	5,000	3,000
ACTIVITY 4.4. SUBTOTAL										111,000	0	0	68,000	43,000	

COMPONENT 4 TOTAL	370,000	0	28,100	196,400	145,500
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5. Developing national capacities	5.1. Project implementation, monitoring and evaluation					906	62000	10003	Contractual Services - Individuals	71400	180,000	45,000	45,000	45,000	45,000	
						906	62000	10003	Communications and other Audio Visual Equipment	72400	60,000	15,000	15,000	15,000	15,000	15,000
						906	62000	10003	Supplies	72500	24,000	8,000	8,000	4,000	4,000	4,000
						906	62000	10003	Rental and Maintenance of Other Equipment	73400	64,000	15,000	15,000	16,000	18,000	18,000
						906	62000	10003	Miscellaneous Expenses	74500	15,000	4,000	4,000	4,000	4,000	3,000
						ACTIVITY 5 SUBTOTAL										
COMPONENT 5 TOTAL											343,000	87,000	87,000	84,000	85,000	

BUDGET TOTAL											2,950,000	686,800	1,023,100	1,009,600	230,500
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SIGNATURE PAGE

Country:	Armenia
UNDAF Outcome 4.1:	Government growth strategies and plans are based on the principles of sustainable development.
Expected CP Outcome:	Access to sustainable energy services is increased.
Expected CP Output:	Legislative frameworks for improving energy efficiency are introduced. New technologies for renewable energy are introduced. Municipal heat and hot water systems are rehabilitated.
GEF Focal Area:	Climate Change
GEF Operational Programme:	Operational Programme #5: "Removal of Barriers to Energy Efficiency and Energy Conservation"
Implementing partner:	Ministry of Nature Protection of the Republic of Armenia

Project Title:	Armenia – Improving the Energy Efficiency of Municipal Heating and Hot Water Supply
Project ID:	00035799
PIMS Number:	1273
Project Duration:	4 years
Management Arrangement:	NEX

Budget:	2,950,000USD
Allocated resources:	
GEF:	
• Project:	2,950,000USD
• Previously approved PDF B:	210,000USD

Agreed by Government:

Vardan Ayvazyan
Minister of Nature Protection
Republic of Armenia

signature

date

Agreed by Implementing partner:

Vardan Ayvazyan
Minister of Nature Protection
Republic of Armenia

signature

date

Agreed by UNDP:

Lise Grande
UN Resident Coordinator
UNDP Resident Representative

signature

date

ANNEXES

- Annex A. Indicative Work Plan
- Annex B. Project Planning Matrix
- Annex C1. Project Management Arrangements
- Annex C2. Project Co-ordination Arrangements
- Annex D. Terms of Reference of the Key Project Personnel
- Annex E. Monitoring and Evaluation Plan
- Annex F. Annual CO2 emissions of the different options as evaluated for one city district in Yerevan, Armenia.
- Annex G. Summary of the World Bank Urban Heat Project
- Annex H. Decree no.1384 “On Reforms in Urban Heating System of the Republic of Armenia”.
- Annex I. Response to the Council Comments

AN INDICATIVE WORK PLAN FOR THE PROJECT⁴

OUTPUTS AND ACTIVITIES	Year 1				Year 2				Year 3				Year 4			
	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4
Output 1.1 Improved legal and regulatory framework to strengthen the role of condominiums																
Activities:																
1.1.1 Reviewing and analyzing the existing legal and regulatory barriers.																
1.1.2 Supporting the drafting of recommendations for eventual legal and regulatory changes needed																
1.1.3 Presenting and entering into dialogue with the responsible Government counterparts for the adoption of the recommendation (e.g. through seminars)																
Output 1.2 Strengthened capacity of the condominiums/other management bodies of the buildings to manage their operations.																
Activities:																
1.2.1 Conducting a public awareness raising and education campaign.																
1.2.2 Building the capacity of the condominiums /other management bodies of the buildings to effectively manage their operations (through training, establishment of specific advisory centers etc.)																
1.2.3 Developing and supporting the commissioning of a transparent, consumption based billing system for condominiums internal use.																
1.2.4 In co-operation with WB Urban Heating Project and other donors, implementing selected pilot projects																
Output 2.1 Implementation strategy for improving the energy efficiency of the existing DH companies																
Activities:																
2.1.1 Updating the current situation analysis																
2.1.2 Preparing master plans for the participating municipalities																
2.1.3 Preparing draft implementation strategy and action plan for the remaining DH companies																
2.1.4 Finalizing and facilitating the adoption of the action plan																
Output 2.2 Improved legal and regulatory frameworks to encourage the EE improvements of the existing DH services.																
Activities:																

⁴ To be finalized by the Project Management Team at the outset of project operations based on the provisions of the project's "Result Framework" and the "Monitoring and Evaluation Plan" (Annex E).

2.2.1 Reviewing the current legal and regulatory framework.																				
2.2.2 Supporting the drafting of recommendations for eventual legal and regulatory changes needed																				
2.3.3 Presenting and entering into dialogue with the responsible Government counterparts for the adoption of the recommendation (e.g. through seminars)																				
<u>Output 2.3</u> Developing and commissioning consumption based metering and billing system. <u>Activities:</u>																				
2.3.1 Implementing selected pilot projects to test different approaches and technical solutions (incl. cost effective technical measures to allow the consumers to regulate their heat consumption)																				
2.3.2 Monitoring, analyzing and presenting the results																				
2.3.3 Finalizing a feasibility study for the introduction of consumption based metering and billing into the existing DH systems.																				
<u>Output 2.4</u> Strengthened capacity of the management and operation personnel of the DH companies to improve the energy efficiency of their operations. <u>Activities:</u>																				
2.4.1 Updating the analysis on the training needs and developing a training strategy.																				
2.4.2 Implementing the training program																				
2.4.3 In co-operation with the personnel of the DH companies, finalizing the feasibility studies and investment proposals for the priority investments and other improvements (an activity associated with the activities under Output 2.1).																				
<u>Output 3.1</u> Improved legal and regulatory framework to encourage the new decentralized service providers to enter into the heat and hot water supply market.. <u>Activities:</u>																				
3.1.1 Reviewing the current legal and regulatory framework.																				
3.1.2 Supporting policy makers in drafting recommendations for eventual legal and regulatory changes needed																				
3.1.3 Presenting, discussing and refining the recommendations and entering into dialogue with the responsible Government counterparts e.g. through workshops, seminars etc.																				
<u>Output 3.2</u> 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. <u>Activities:</u>																				
3.2.1 Updating the analysis on the training needs and																				

<u>Activities:</u>																										
4.3.1 Monitoring the construction, commissioning and operation of the first pilot/demonstration projects																										
4.3.2 Compiling and analyzing the experiences and lessons learnt from developing, commissioning and operating the first demonstration projects																										
4.3.3 Conducting an independent project midterm and final evaluation																										
4.3.4 Compiling, publishing and disseminating the final project summary report																										
<u>Output 4.4 Project results, experiences and lessons learnt disseminated at the national and regional level.</u>																										
<u>Activities</u>																										
4.4.1 Translating the final project report in Armenian and Russian and distributing it to different key stakeholders in Armenia and abroad.																										
4.4.2 Organizing end-of-the project seminar and, as applicable, regional workshops and other outreach activities.																										

PROJECT PLANNING MATRIX⁵

Project Strategy	Objectively Verifiable Indicators	Means of Verification	Assumptions
<p>Development Goal: <i>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.</i></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</p>	<p>National energy statistics, GHG inventories and targeted surveys</p> <p>Project monitoring and evaluation reports, post-project surveys</p> <p>See above</p> <p>See above</p> <p>Project reports</p>	<p>Consistency with the official Government policy and strategies.</p> <p>Continuing commitment of the Government of Armenia to introduce changes in the legal and regulatory framework that promote the restructuring of the heat and hot water supply sector towards more commercial and energy efficient one, while at the same time addressing the social and affordability aspects.</p>

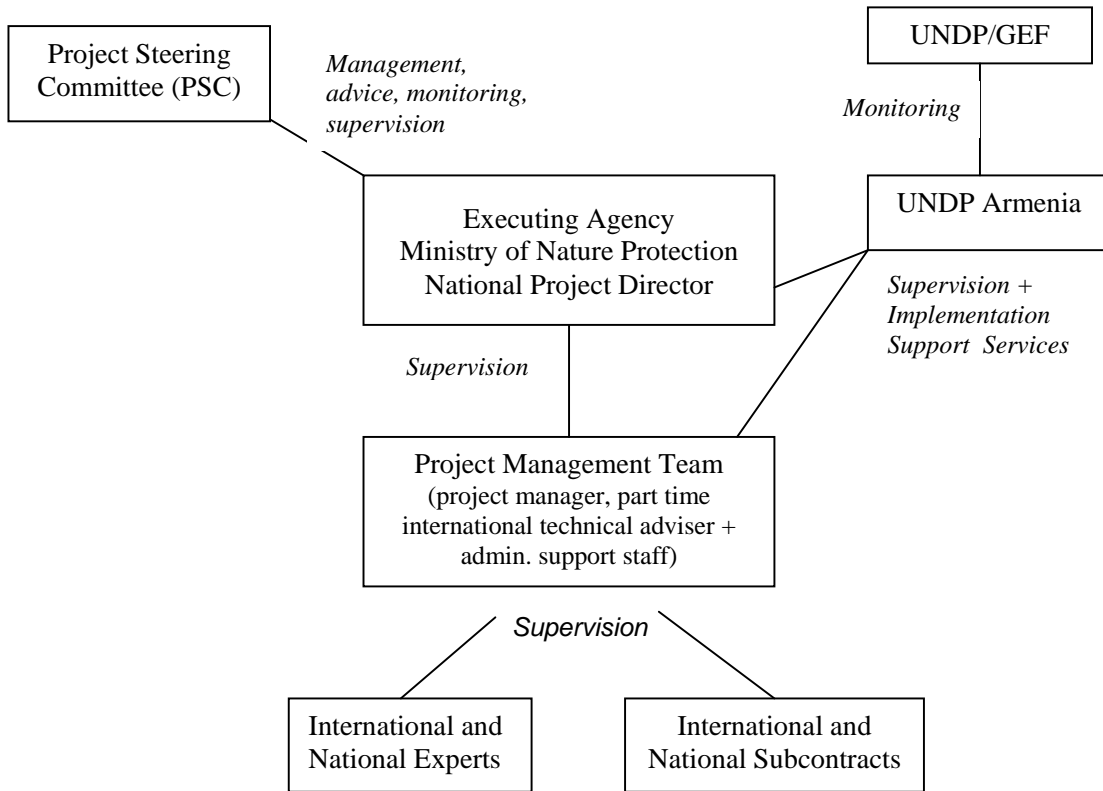
⁵ For a more detailed outline of project's success indicators, benchmarks and means of verification, see Annex E, Monitoring and Evaluation Plan

	promoting other energy efficient alternatives for the current use of electricity and fuel wood for heating purposes		
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 building level.	Signed contracts, within the condominium as well as between the service providers and condominiums for the provision of heat and hot water supply services.	Project monitoring reports	Strong enough incentives for the tenants to get organized as a condominium exist
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.	Project reports	Continuing commitment of the Government to introduce changes in the legal and regulatory framework that promote the role of the condominiums.
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	Project reports	A supportive institutional, legal and regulatory framework. Continuing interest of the tenants to operate as a condominium
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.	Project evaluation reports	Genuine interest of and incentives for the company management to support the restructuring process.
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.	Project reports	Genuine interest of and incentives for the company management to support the restructuring process.
Output 2.2 Improved legal and regulatory frameworks to encourage and support the improved energy efficiency of the	Recommendations for the legal and regulatory changes to support the targeted EE investments finalized and discussed with the relevant	Project reports	Continuing commitment of the Government to introduce changes in the legal and regulatory framework that promote the

existing DH services and the commercial operation of the remaining DH companies.	Government counterparts and, as applicable, adopted.		restructuring of the heat and hot water supply sector.
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	Project reports	A supportive institutional, legal and regulatory framework.
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	Project evaluation reports	Incentives for the company management to support the restructuring process.
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.	Project reports	A supportive institutional, legal and regulatory framework. Condominiums that can represent themselves as credible, legal counterparts for contracts exist.
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.	Project reports	Continuing commitment of the Government to introduce changes in the legal and regulatory framework that promote the restructuring of the heat and hot water supply sector.
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	Project evaluation reports	Availability of a pilot financing scheme/credit line
Output 3.3 A certification system for qualified service and equipment providers.	The certification system developed and adopted.	Project reports	Supportive institutional, legal and regulatory framework.

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.	<p>Final project report documenting the results, experiences and lessons learned.</p> <p>Expressions of interests to replicate the project activities at the national and regional level.</p>	Project reports	
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.	<p>The GHG emission monitoring protocol developed</p> <p>The operating personnel of the projects trained for compiling the information needed</p> <p>The GHG emission removal as a result of the avoided deforestation assessed</p>	Project reports	
Output 4.2 Norms and enforce mechanisms for preventing the unsustainable use of forest resources as wood fuel.	<p>Norms for defining the amounts of sustainable use of forest wood developed and adopted.</p> <p>The possible enforcement mechanisms evaluated, developed and adopted.</p>	Project reports.	
Output 4.3 Compilations, evaluations and analyses of experiences and lessons learned under the project.	Finalized project monitoring and evaluation reports.	Project reports	
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.	Project reports	Successful completion of the project activities

UNDP/GEF PROJECT MANAGEMENT ARRANGEMENTS



*UNDP/GEF “Armenia- Improving the
Energy Efficiency of Municipal Heating and Hot Water Supply”*

TERMS OF REFERENCE

Project Steering Committee (PSC)

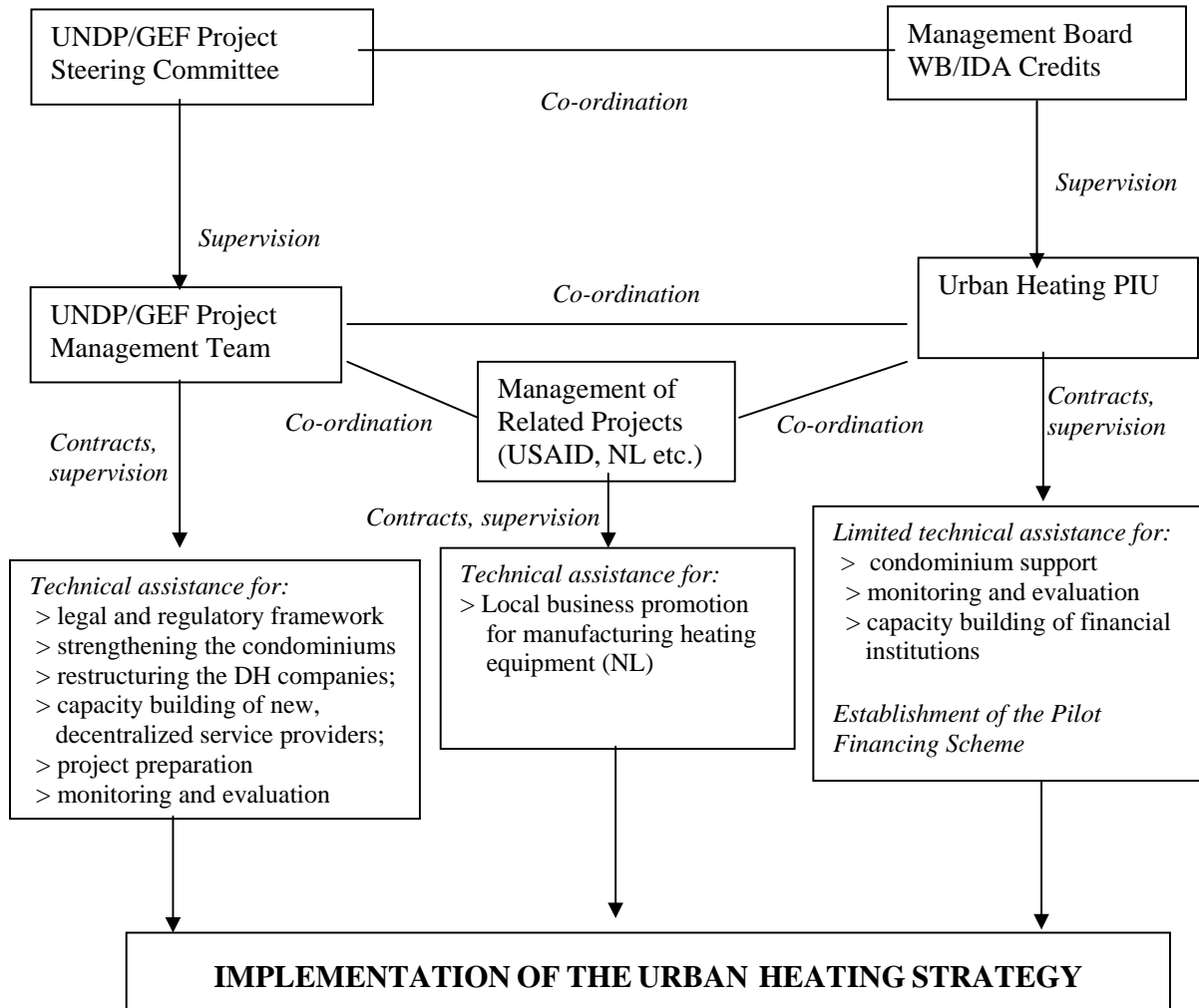
The Project Steering Committee (PSC) will be charged with inter-institutional coordination, overseeing and advising Project on the execution of Project activities and will have decision-making power.

The project will be implemented under the overall coordination of PSC, the latter together with the Implementing Agency (UNDP) is responsible for project progress and continuous monitoring to achieve the goals under the UN Framework Convention on Climate Change.

The PSC meets once in six months or when required and has the following duties:

- Oversee project progress and provide general consultation for project implementation policy ensuring the project’s consistency with the other ongoing processes in the country;
- Provide a linkage between the project and stakeholder agencies in favour of implementation of national urban heating strategy, which is in conformity with the direct objectives of reduction of GHG emissions through utilization of environmentally sound technologies;
- Approve annual plans, including procurement plan, budget and budget revision drafts and sub-contractor’s terms of references if the contract exceeds 30,000 USD;
- Promote the relevant data collection and ensure constant information exchange between stakeholders;
- Facilitate the communication between the project and respective sectors and promote the decision making effectiveness;
- Ensure access to information on project progress and outcomes of responsible local self-governing bodies for implementation of project objectives;
- Identify technical constraints, which may hinder project timely implementation and recommend relevant activities;
- Review and assess project quarterly outputs.

PROJECT CO-ORDINATION ARRANGEMENTS



TERMS OF REFERENCE OF THE KEY PERSONNEL

Project Coordinator

The Project Coordinator ensures the project ongoing coordination.

Duties:

- At the outset of project implementation, in-cooperation with UNDP ensures the selection of project implementation team;
- Ensures the project overall coordination and supervision, including overseeing and coordination of the work of project implementation team, national experts and sub-contractors;
- Manages the project budget under the supervision and in co-operation with the Executing Agency and UNDP;
- Reports regularly on the progress of the project to the Executing Agency and UNDP as specified under Section H of the project document: “Project Review, Evaluation and Reporting” including the compilation of the Annual Project Reports (APRs) and Project Implementation Reviews (PIRs) and in Annex E: “Monitoring and Evaluation Plan”;
- Ensures the access to the project outcomes for stakeholder agencies and organisations;
- Establishes relationships with national and international financial organizations for identification of cooperation perspectives to mobilize additional financial resources in order to achieve project goals.

Estimated duration: 48 man-months

Qualifications:

- higher education in energy or environment related field with good knowledge on the institutional and technical aspects of the heating sector development in Armenia ;
- demonstrated capacity to effectively manage projects financed by international donors in Armenia, especially in environment and energy sectors;
- good knowledge and experience on dealing with the existing governmental structures and policy framework to overcome existing legal, regulatory and other policy related barriers to successfully launching the first demonstration projects and to promoting the development of Armenia’s heating sector in general;
- good interpersonal and training skills;
- computer skills;
- fluency in Armenian language
- knowledge of English language is desirable;
- familiarity with the UNDP rules and regulations

Project Manager

The Project Manager ensures the management of project ongoing activities under direct supervision of Project Coordinator.

Duties:

- At the outset of project operations, in co-operation with the international technical adviser finalizes the detailed work plan and the Terms of Reference for the project implementation team;
- Ensures, through the overall organization of the project implementation, that the expected outputs are completed on time and that they comply with the specific project criteria and requirements;
- Organizes and supervises the work of the project personnel, national experts and subcontractors;
- Ensures the project budget delivery under the supervision of Project Coordinator;
- Ensures elaboration of tender conditions for experts and sub-contractors (development of terms of references, contract and competition terms), procurement of equipments and other materials in a timely and cost-effective manner in accordance with the UNDP rules and procedures;
- Develops annual and quarterly workplans, as well as the documents to be submitted to the Project Steering Committee's approval and ensures ongoing operations of project office;
- Regularly reports on the progress of the project to the Project Coordinator according to the Executing Agency and Project Implementing agencies procedures;
- Ensures organization of seminars, trainings and publications, as well as information dissemination on the project activities and results.

Estimated duration: 48 man-months

Qualifications:

- higher education in energy or environment related field with good knowledge on the institutional and technical aspects of the heating sector development in Armenia ;
- demonstrated capacity to effectively manage projects financed by international donors in Armenia, especially in environment and energy sectors;
- good knowledge and experience on dealing with the existing governmental structures and policy framework to overcome existing legal, regulatory and other policy related barriers to successfully launching the first demonstration projects and to promoting the development of Armenia's heating sector in general;

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- good interpersonal and training skills;
 - computer skills;
 - fluency in Armenian and English language languages;
 - familiarity with the UNDP rules and regulations.

Expected outputs:

The project finalised successfully according to the planned schedule, including:

- recommendations on the legal and regulatory changes and other incentives to promote the heating sector development in Armenia developed and submitted for the Government approval process;
- the first pilot projects successfully under implementation;
- the master plans and the investments proposals for the participating communities and remaining DH companies finalised and the planned pilot projects under implementation;
- a consumption based metering and billing system applicable to the Armenian conditions developed and introduced as a part of the planned pilot projects;
- the capacity of the local stakeholders built in line with the provisions of the project's "Results Framework";
- a certification system in place for the new, decentralised service providers;
- the project results, experiences and lessons learnt documented and disseminated at the national and regional level, including the compilation and finalization, in co-operation with local project team, the final project report.

International Technical Adviser (ITA)

Duties:

To support the project management team to successfully implement the project ensuring that the expected outputs are completed on time and that they comply with the specific project criteria and requirements, including, among others:

- in co-operation with the local project team, finalising a detailed work plan and the Terms of Reference for the project personnel;
- participating in the staff selection and supporting the UNDP and the local project team in conducting the tenders for the international subcontracts (incl. the finalisation of the bidding documents, the publishing of the tender and evaluation of the offers received);
- assisting the project team otherwise in organising the implementation of the different sub-components of the project;
- assisting the project manager in supervising the work of individual experts and subcontractors;
- supporting the project manager in co-operation with the current project partners and, as applicable, in establishing new, additional partnerships to support the project goals and objectives;
- training personally or, as needed, organising training for the local stakeholders to successfully implement the project and to meet its capacity building objectives;
- participating otherwise in the implementation of the project activities, as agreed during the project initiation phase, including work on the institutional issues and on the detailed design of the first pilot projects;
- monitoring the progress of the project and participating in tripartite reviews and other periodic progress reviews; and
- compiling the final project report

Estimated duration:

24 man-months (distributed over the total duration of the project of four years)

Expected outputs:

The project finalised successfully according to the planned schedule, including:

- recommendations on the legal and regulatory changes and other incentives to promote the heating sector development in Armenia developed and submitted for the Government approval process;
- the first pilot projects successfully under implementation;
- the master plans and the investments proposals for the participating communities and remaining DH companies finalised and the planned pilot projects under implementation;
- A consumption based metering and billing system applicable to the Armenian conditions developed and introduced as a part of the planned pilot projects;
- The capacity of the local stakeholders built in line with the provisions of the project's "Results Framework";

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- A certification system in place for the new, decentralised service providers;
 - the project results, experiences and lessons learnt documented and disseminated at the national and regional level, including the compilation and finalization, in co-operation with local project team, the final project report. .

Qualifications

- an advanced degree (equivalent to M.Sc) in energy related field with in-depth knowledge on project financing and management as well as on the institutional and technical aspects of the heating sector development in CIS countries;
- demonstrated capacity to successfully support heating sector activities in CIS countries;
- good interpersonal and training skills;
- good computer skills;
- fluency in English; and
- ability to reside in Armenia long periods (several months in a row) during the implementation of the project, as needed.
- knowledge of Armenian or Russian language is a strong asset.

Short and Long Term National Consultants

National Consultants, for both short and longer-term assignments, will be recruited from qualified candidates at the national and regional levels. National Consultants will play an important role in project implementation so that the project remains country-driven and local and national capacities are enhanced. To ensure the best output, the national consultants will work in close co-operation with the international technical adviser as well as with other international experts and subcontractors that will be hired on as needed basis.

National Consultants are envisaged to be recruited to undertake project work, e.g. in the following areas:

- Review of the legal, institutional and regulatory framework and the existing legal and regulatory barriers to the sustainable development of the heating sector;
- Strengthening the 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 (technical, institutional, legal and financial aspect);
- Preparation of master plans and the investments proposals for the participating communities and remaining DH companies;
- Development of a consumption based metering and billing system;
- Designing, constructing and implementing the first pilot projects;
- Developing and establishing a certification system for the new service providers;
- Developing norms and enforcement mechanisms for preventing the overuse of the forest resources; and
- Monitoring the implementation of the first demo projects and documenting and disseminating the lessons learnt.

The more detailed Terms of References for each required consultancy will be prepared in co-operation between the PM and the ITA at the outset of project operations and on as needed basis.

Short and Long Term International Consultants

International Consultants, for both short and longer term assignments, will be recruited from qualified candidates to assist in the delivery and implementation of those activities for which domestic expertise is lacking and which support can not be provided directly by the ITA. The estimated level of support for each project component is indicated by the project "Results Framework" and the project budget.

The more detailed Terms of References for each required consultancy and the overall strategy for using the expert services will be finalized in co-operation between the PM and the ITA at the outset of project operations, in consultation with the UNDP/GEF technical advisers or program coordinators.

MONITORING AND EVALUATION PLAN

Project Objectives Outputs/Performance Indicators	M&E Activity	Responsibilities for M&E Activities	Timeframe
<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 building level.</p> <p>Indicator: Signed contracts, within the condominium as well as between the service providers and condominiums on the provision of heat and hot water supply services to the tenants.</p>			
<p>Output 1.1 Improved legal and regulatory framework to strengthen the role of the condominiums</p> <p>Success Indicator: Recommendations for the legal and regulatory changes adopted by the end of the Year 3.</p> <p>Intermediate Benchmarks:</p> <p>(a) Draft recommendations finalized and presented to the relevant Government counterparts by the end of the Year 1 and updated annually.</p> <p>(b) At least one workshop to discuss the recommendations organized by the end of the Year 1</p> <p>(c) The recommendations submitted and entering formally the Government approval process by the end of the Year 2</p>	<p>Project Midterm and Final Evaluation</p> <p>Annual Project Reports (APR)</p> <p>Project Implementation Reviews (PIR)</p>	<p>CO, UNDP/GEF HQ</p> <p>PMU (Project Management Unit) / UNDP CO</p>	<p>In the middle and at least three months before the end of the project, respectively</p> <p>12 months after the beginning of the project, after that annually</p>

Immediate Objective 2: Supporting the restructuring process and building the capacity of the existing DH companies to improve the efficiency of their operations.

Indicator: Enhanced capacity of the companies to manage their operations and to leverage financing for the investments needed.

<p>Output 2.1 Implementation strategy to improve the energy efficiency of the existing DH companies and to facilitate their gradual restructuring and commercialization.</p> <p>Success Indicator: The implementation strategy adopted by the Government and the Municipality/DH company concerned by the end of the Year 3.</p> <p>Intermediate Benchmarks:</p> <p>(a) The current situation analysis finalized during the first six months of the project</p> <p>(b) The master plans for the participating municipalities finalized by the end of the Year 2.</p> <p>(c) The draft implementation strategy and action plan finalized and presented for consideration by the middle of Year 3</p>	<p>APRs/PIRs</p> <p>APRs/PIRs</p>	<p>PMU / UNDP CO</p> <p>PMU / UNDP CO</p>	<p>12 months after the beginning of the project, after that annually</p>
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<p>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.</p> <p>Success Indicator: Recommendations for the legal and regulatory changes adopted by the end of the Year 3.</p> <p>Intermediate Benchmarks:</p> <p>(a) Recommendations on the legal and regulatory changes to support the restructuring process and the general improvement of the energy efficiency of the remaining DH companies finalized, presented and discussed with the relevant Government counterparts by the end of Year 1 and updated annually</p> <p>(b) At least one workshop to discuss the recommendations organized by the middle of Year 2</p> <p>(c) The recommendations submitted and entering formally the Government approval process by the end of the Year 2</p>	<p>Project Midterm and Final Evaluation</p> <p>APRs/PIRs</p>	<p>CO, UNDP/GEF HQ</p> <p>PMU / UNDP CO</p>	<p>In the middle and at least three months before the end of the project, respectively</p> <p>12 months after the beginning of the project, after that annually</p>
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Immediate Objective 3: Supporting the emerging new service providers in offering their services to the condominiums and structuring financing for the investments needed

Indicators: 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.

Success Indicator: Recommendations for the legal and regulatory changes adopted by the end of the Year 3.

Intermediate Benchmarks:

- (a) Recommendations on the legal and regulatory changes to support the restructuring process and the general improvement of the energy efficiency of the remaining DH companies finalized, presented and discussed with the relevant Government counterparts by the end of Year 1 and updated annually
- (b) At least one workshop to discuss the recommendations organized by the end of the Year 1
- (c) The recommendations submitted and entering formally the Government approval process by the end of the Year 2

Project Midterm and Final Evaluation

APRs/PIRs

CO, UNDP/GEF HQ

PMU / UNDP CO

In the middle and at least three months before the end of the project, respectively

12 months after the beginning of the project, after that annually

<p>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.</p> <p>Success Indicators:</p> <p>Investment proposals prepared and financed</p> <p>Projects worth of at least USD 5 million under implementation by the end of the project.</p> <p>Commercial sustainability of at least 5 companies established by the end of the project</p> <p>Intermediate Benchmarks:</p> <p>(a) Training strategy developed by the end of the Year 1.</p> <p>(b) The first training program implemented by the end of the Year 2 and repeated/updated on as needed basis during the project lifetime.</p> <p>(c) At least three pilot projects, testing different technologies and approaches under implementation by the end of Year 2.</p> <p>(d) Investment and technology proposals prepared and submitted for financing for other projects by the end of Year</p>	<p>Project Final Evaluation</p> <p>APRs/PIRs</p>	<p>CO, UNDP/GEF HQ</p> <p>PMU / UNDP CO</p>	<p>At least three months before the end of the project, respectively</p> <p>12 months after the beginning of the project, after that annually</p>
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<p>Output 3.3 A certification system for qualified service and equipment providers.</p> <p>Success Indicator: The certification system adopted, established and in operation by the end of the project.</p> <p>Intermediate Benchmarks:</p> <p>(a) The draft design of the certification system (including its institutional set-up) finalized by the end of Year 1.</p> <p>(b) The consultations with the relevant Government authorities and the development of the agreed certification system finalized and the system adopted by the end of Year 3.</p>	<p>Project Final Evaluation</p> <p>APRs/PIRs</p>	<p>CO, UNDP/GEF HQ</p> <p>PMU / UNDP CO</p>	<p>At least three months before the end of the project, respectively</p> <p>12 months after the beginning of the project, after that annually</p>
<p>Immediate Objective 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.</p> <p>Indicator: Final project report documenting the results, experiences and lessons learned published and distributed.</p> <p>Expressions of interests to replicate the project activities at the national and regional level.</p>			
<p>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</p> <p>Success Indicator: Report presenting the verified GHG emission reductions achieved finalized by the end of the project.</p> <p>Intermediate Benchmarks:</p> <p>(a) The GHG emission monitoring and verification protocol developed by the end of Year 1.</p> <p>(b) The operating personnel of the projects trained for compiling the information needed by the end of Year 2</p> <p>(c) The required equipment for monitoring installed by the end of Year 2</p> <p>(d) The GHG emission removal as a result of the avoided deforestation assessed by the end of the Year 4.</p>	<p>Project Terminal Report</p> <p>APRs/PIRs</p>	<p>PMU / UNDP CO</p> <p>PMU / UNDP CO</p>	<p>At least 1 month before the end of the project</p> <p>12 months after the beginning of the project, after that annually.</p>

<p>Output 4.2 Norms and enforce mechanisms for preventing the unsustainable use of forest resources as wood fuel.</p> <p>Success Indicator: The proposed norms and enforce mechanisms adopted by the Government by the end of the project.</p> <p>Intermediate Benchmarks: The draft norms and enforce mechanisms developed and submitted for Government consideration by the end of Year 2.</p>	<p>Project Final Evaluation</p> <p>APRs/PIRs</p>	<p>CO, UNDP/GEF HQ</p> <p>PMU / UNDP CO</p>	<p>At least three months before the end of the project, respectively</p> <p>12 months after the beginning of the project, after that annually</p>
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<p>Output 4.3 Compilations, evaluations and analyses of experiences and lessons learned under the project.</p> <p>Success Indicator: Project's final report adopted by the Government and UNDP by the end of the project.</p> <p>Indicator:</p> <p>(a) Report summarizing the results and lessons learnt from the construction, commissioning and the first year's operation of the first pilot projects finalized by the end of the 3rd year.</p> <p>(b) Midterm evaluation completed and the report made available by the end of the Year 2.</p> <p>(c) Final evaluation completed and made available at least three months before the anticipated closing date of the project.</p> <p>(d) Draft final project report made available at least two months before the end of the project.</p>	<p>Project Terminal Report</p> <p>APRs/PIRs</p>	<p>PMU / UNDP CO</p> <p>PMU / UNDP CO</p>	<p>At least 1 month before the end of the project</p> <p>12 months after the beginning of the project, after that annually</p>
<p>Output 4.4 Project results, experiences and lessons learnt, disseminated at the national and regional levels.</p> <p>Indicators:</p> <p>(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.</p> <p>(b) The final report distributed to key institutions both within Armenia and abroad by the end of the project.</p> <p>(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.</p>	<p>Project Terminal Report</p>	<p>PMU, UNDP CO</p>	<p>At least 1 month before the end of the project</p>

* The unit in **bold** has the lead responsibility.

Reporting

Ongoing project reporting will be provided in accordance with established UNDP procedures and will be provided by the UNDP Country Office with support from UNDP/GEF. Overall supervision of the Project on behalf of the Government and the executing agency will be the responsibility of the Project Director.

The Project Management Unit will be responsible for the preparation and submission of the following reports:

Inception Report (IR)

The inception report is to be prepared by the Project Management Unit, with the assistance of project experts as is deemed relevant. The IR will be prepared no later than three months after project start-up and will include a detailed work plan and budget for the duration of the project, progress to date on project establishment and start-up activities, and any proposed amendments to project activities or approaches. Detailed Work Plan for the Year 1 will be submitted within 30 days after the launch of the project. The report will be circulated to all the parties who will be given a period of one calendar month in which to respond with comments or queries, including a review by the UNDP Country Office and UNDP/GEF Regional Co-ordinator, to ensure consistency with the objectives and activities indicated in the Project Document.

Harmonised Annual Project Report (APR)/Project Implementation Review report (PIR)

The Annual Project Report (APR) is designed to obtain the independent views of the project's main stakeholders concerning its continuing relevance, performance and the likelihood of its success. The APR aims to: a) provide a rating and textual assessment of the project in achieving its objectives; b) present stakeholders' insights into issues affecting project implementation and their proposals for addressing those issues; and c) serve as a source of inputs to the Tripartite Review (TPR). The main project stakeholders participate in the preparation of the APR.

A major tool for monitoring the GEF portfolio and extracting lessons is the annual GEF Project Implementation Review (PIR). The PIR has become an essential management and monitoring tool for project managers and offers the main vehicle for extracting lessons from ongoing projects.

The PIR is mandatory for all GEF projects that have been under implementation for at least one year at the time that the exercise is conducted. The implementation of the project begins when all parties have signed the project document. The PIR questionnaire is sent to the UNDP country office, usually around the beginning of June. It is the responsibility of the Project Director/PM to complete the PIR questionnaire, with the oversight of the UNDP Country Office.

In order to reduce the load on the project teams, a *Harmonized APR/PIR* format has been developed to be filled in and submitted by the project team on the annual basis. APR/PIR will be prepared by the project management team with UNDP CO and other project stakeholders.

Periodic Status Reports

As and when called for by the Project Director, the government or UNDP, the Project Manager will prepare Status Reports, focusing on identified specific issues or areas of activity. The request for a Status Report will be in written form, and will clearly state

the issue or activities that need to be reported on. These reports can be used to provide specific overviews of key areas, or as troubleshooting exercises to evaluate and overcome any encountered obstacles and difficulties. The parties are requested to minimize requests for Status Reports and, when such are necessary, will allow reasonable timeframes for their preparation.

Technical Reports

Technical Reports are detailed documents covering specific areas of analysis or scientific specialization within the overall project. As part of the Inception Report the Project Director/PM will prepare a draft Reports List, detailing the technical reports that are expected to be prepared on key areas of activity during the course of the Project, and tentative due dates. Where necessary, this Reports List will be revised and updated, and included in subsequent PIRs/APRs. Technical Reports may also be prepared by external consultants as Final Reports for their technical inputs, and should be comprehensive, specialized analyses of clearly-defined areas of research within the framework of the project and its sites.

Project Publications

Project Publications will be a key tool for crystallizing and disseminating the results and achievements of the Project. These Publications will be scientific or informational texts on the activities and achievements of the Project, in the form of books, journal articles or multimedia publications. These Publications can be based on Technical Reports, depending upon the relevance, scientific worth, etc. of these Reports, or may be summaries or compilations of a series of Technical Reports and other research. The Project Director/PM will determine whether specific Technical Reports merit formal publication, and will also, in consultation with the government and other parties and with the help of external specialists and staff where necessary, plan and produce these Publications in a consistent and recognizable format and identity. These Publications will form the most visible public output of the Project, and as such should be prepared and presented to the highest scientific and technical standards.

Project Terminal Report

During the last three months of the project, the Project Director/PM will prepare the Project Terminal Report. This comprehensive report will summarize all activities, achievements and outputs of the Project, lessons learned, objectives met and unattained, structures and systems implemented, etc. and will be the definitive statement of the Project's activities over its duration. It will also clearly set forth recommendations for any further steps that may need to be taken to ensure the sustainability and replicability of the Project's activities.

Other Publications and Publicity Activities

In order to ensure international dissemination of project results, **a high-quality publication of results** will be prepared, based upon the Project Terminal Report and previous Project Publications. Also at least one *international workshop or conference* to showcase the project and its results is planned to be organized.

Tripartite Review (TPR)

The tripartite review (TPR) is the highest policy-level meeting of the parties directly involved in the implementation of a project. The project will be subject to Tripartite Review (TPR) at least once every twelve months by representatives of the Government, the executing agency and UNDP, and the first such meeting to be held

within the first twelve months of the start of full implementation. The Project Management Unit will prepare an APR/PIR for submission to UNDP. The APR/PIR must be ready two weeks prior to the TPR.

The APR/PIR will be used as one of the basic documents for discussions in the TPR meeting. The National Project Director/PM presents the APR/PIR to the TPR, highlighting policy issues and recommendations for the decision of the TPR participants. The NPD also informs the participants of any agreement reached by stakeholders during the APR/PIR preparation on how to resolve operational issues.

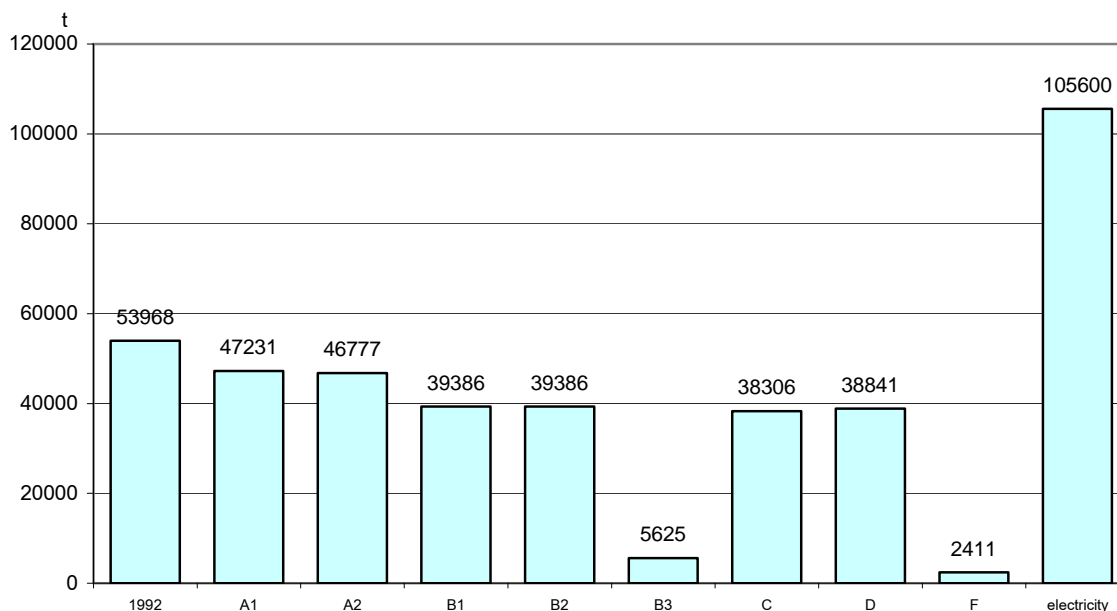
Terminal Tripartite Review (TTR)

The terminal tripartite review is held in the last month of project operations. The Project Management Unit is responsible for preparing the Terminal Report, and its submission to UNDP. The two key documents to serve the discussion in the TPR are: (i) Terminal Report and (ii) Final Project Evaluation.

The draft Terminal Report shall be prepared in draft form sufficiently in advance (at minimum 3 months before project's finalisation) After completing the final evaluation, the Terminal Report will be updated taking into account the conclusions of the evaluation. The updated Terminal Report will be sent for review and technical clearance by the executing agency and UNDP at least 6 weeks before the TPR meeting and the final Terminal Report and the Final Evaluation Report to the participants of the TPR at least 3 weeks before the TPR meeting.

The Terminal Report will serve as the basis for discussions in the TTR. The terminal tripartite review will consider the implementation of the project as a whole, paying particular attention to whether the project achieved its immediate objectives and contributed to the broader environmental objective, and will indicate whether any further actions are still necessary.

**ANNUAL CO₂ EMISSIONS OF THE DIFFERENT OPTIONS AS EVALUATED
FOR ONE CITY DISTRICT IN YEREVAN, ARMENIA ⁶**



Options A - Rehabilitation of the former DH system “as it was”:

A1 - The insulation of the four-pipe distribution heat networks is done by the previously accepted method, i.e. with mineral wool insulation.

A2 - The four-pipe distribution heat networks are reconstructed with pre-insulated pipes.

Option B - Rehabilitation of the centralized district heating system based on modern approaches and technologies. The heat carrier is supplied to each building, or a group of 1-3 buildings, for which individual or group heat sub-stations are constructed:

B1 - Centralized heating system with 320 individual substations:

B2 - Centralized heating system with 113 group substations:

B3 – Option B1 + co-generation (gas turbines or gas motors)

Option C – Small area heating: The former substations are reconstructed into 18 area boiler houses with high-efficiency gas boilers.

Option D - Decentralized heat supply from 150 gas boilers serving 1-3 buildings each.

⁶ The GHG emissions of electricity production have been estimated to be equal to a gas fired condensing power plants, which are needed to meet the additional power load in the winter time due to the growing heating needs. In this calculation, the GHG emission reduction benefits of co-generation have also been fully accounted for the heating component.

Option F - Integrated system: Rehabilitation of the DH network and its connection with the Yerevan Thermal Power Plant together with the other surrounding areas.

Option E – Electricity

SUMMARY OF THE WORLD BANK URBAN HEAT PROJECT

Project objective

The project is designed to support implementation of the Armenian Urban Heating Strategy adopted by the Government in September 2002. The main objective of the project is to increase the number of urban households that have access (consume and pay for) to affordable, safe and environmentally sustainable heating services.

Through a community-driven process, the proposed project will contribute to significantly reduce the barriers to the provision of more efficient, environmentally sustainable and affordable heating services on commercial terms. Furthermore, the project will mitigate the impact from expected Medzamor Nuclear Power Plant (NPP) closure through the promotion of energy efficiency and the shift from electricity- to gas-based heating.

Background

During the 1990s, most of the district heating systems which had supplied winter heating and year-round hot water in the towns and cities to at least 50% of the country's population, fell into disrepair due largely to the effects of the economic blockade, energy crisis and subsequently massive deterioration of gas infrastructure. Since the mid-1990s, national and urban authorities have restored district-heating services to eight municipalities, attempting to cut supply costs, charge cost-reflective tariffs and enforce payment. This has helped reduce somewhat the fiscal burden and asset depletion associated with these heating systems, but cost recovery has remained unsustainable. As a result, less than 10% of the population currently receives heat from district heating systems. However, even this restricted supply is provided in a non-commercial manner with virtually no accountability for supply or consumption (for example, absence of any metering) and weak mechanisms for enforcing payment. Non-payment amounted to about US\$10-12 million annually (about 0.5% of GDP) until a few years ago and resulted in the central government having to clear arrears of the heating companies to their fuel suppliers.

The rest of the population (more than 90%) resorts mostly to individual heating solutions such as electric heaters or fuel wood stoves in urban and rural areas, supplemented by dung and waste in rural areas. Electric heating is expensive and enjoys a high degree of payment enforcement, making it an option only for the relatively better off. The urban poor are left to burning wood and other dirty fuels (including waste), often in apartment buildings without adequate ventilation for wood burning, with detrimental health implications and accelerated deforestation of already strained forestry resources.

Implication of inadequate heat provision

Lack of affordable and environmentally sustainable heating in Armenia has huge negative implications, such as:

1. Heating related expenditures consume a significant portion of household income (second after food for low-income families) and contribute to poverty;
2. Existing district heating companies suffer from non-payment in the order of US\$10-12 million a year (reduced to about 6 million annually in the past two heating seasons due to

somewhat increased collections), which is ultimately provided by the government, thus contributing to the quasi-fiscal deficit. This “subsidy” benefits, however, only less than 10% of the population, both poor and non-poor households;

3. Electricity and wood are extensively relied on to meet urban heating demand because these energy sources are either financially more affordable (wood, diesel, waste) or because they lend themselves to individual consumption preferences and can be matched with affordability (electricity);
4. The extensive use of wood for heating purposes contributes significantly to deforestation with major adverse environmental consequences for the country. Prices of wood are under-valued since most of the cutting is illegal and prices do not reflect environmental factors or the cost of the resources. Wood prices are likely to go up with better enforcement of wood cutting quotas;
5. The use of wood and waste for heating purposes in apartment buildings constructed without adequate ventilation for this kind of fuel has detrimental health implications particularly for the young and the old;
6. Lack of adequate heating results in accelerated deterioration of physical conditions of the multi-apartment buildings;
7. The extensive use of electricity for heating purposes is costly for consumers (about US\$50/MWh vs. US\$25/MWh for alternatives, where one MWh is the minimum necessary to heat one room during the winter season), and it doubles peak power demand during the winter months. This increases the cost of electricity production and the need for investment in generation and distribution assets. In the long-term this would increase the cost of electric heating even more. In addition the increase in electricity prices is almost inevitable due to the privatization of assets, need for massive investments in power sector and closure of Medzamor NPP.

Urban Heating Strategy

An Urban Heating Strategy (UHS) was developed by the Government during 2001/2002 for the cities of Yerevan, Gyumri, Charentsavan and Jermuk, with major contribution by the World Bank (see Armenia Urban Heating Strategy: Summary Report and Recommendations, The World Bank 2002; executive summary in PCD Annex). It provides the strategic framework for the short-, medium- and long-term development of the Armenian urban heating sector, consisting of three phases:

1. “Survival” during years 1 and 2: Framework for a market-based provision of heating services is put in place, including testing whether consumers opt for existing CH supply under conditions which permit full commercialization of CH services and whether private providers of autonomous heating services emerge. Creation of market conditions for the commercial provision of heating by eliminating informational, regulatory, and “mind-set” barriers is supported;
2. “Recovery” during years 3-5: Promote implementation of sustainable heating options; surviving district-heating systems coexist with new heating options. Continue strengthening of institutional capacity. Financial and social mechanisms are operational.

3. "Growth" during years 6-25: Experience from Phases 1 and 2 generates large-scale demand for affordable heating solutions - decentralized heating systems and possibly investments for DH modernization - with major improvements in service quality and coverage. Non-concessional financing can be attracted for investments.

During the development of the UHS, the technical, financial, fiscal and institutional aspects of three basic heat supply options (see box below) were investigated. To check the feasibility of each of these options UHS considered a number of affordability-adjusted scenarios. The principle behind the scenarios is that in the 'survival' period the heat demand is reduced drastically (by decreasing comfort temperature, by only heating a part of the dwelling) to bring it into line with the affordability constraints identified in the demand survey. Furthermore, investments in existing heat supply networks are kept at an absolute minimum. In the 'recovery' period the demand starts to increase from a low level, and during the 'growth' phase demand comes finally back to the norm. The analysis also includes a review of the natural gas infrastructure rehabilitation requirements to accommodate various heating options. Its costs are estimated at about US\$ 8-10 million in the four cities, excluding the building internal measures.

Heat Supply Options Investigated

1. Rehabilitation/modernization of the existing centralized (district) heating systems. Heat and domestic hot water is produced in gas-based combined-heat-and-power (CHP) plants or large or small heat-only boilers and delivered to buildings through a network of hot-water pipes.
2. Autonomous heating systems where small-capacity gas-based boiler- or CHP-plants supply heat and hot water to 1-3 multi-apartment buildings.
3. Individual heating of apartments (and individual houses), based on natural gas, electricity, wood or other available fuels.

Based on this analysis of heating options in the four-targeted cities the UHS draws the following conclusions about the technical options:

If district heating is to be continued at all, modifications will have to be made in the way it is supplied to consumers in order to provide affordable quantities and quality of heat without continuing widespread subsidies; i.e., the provision of heat has to be controlled by the consumer, it has to be flexible and it has to be billed based on metered consumption.

Decentralized heating with autonomous gas-based boilers and individual natural gas stoves, which were identified as the least-cost options in the long-term should be promoted in all areas and allowed to compete with district heating under a sensible institutional framework. The high initial costs associated with these options may, however, render them unaffordable for the majority of the population until economic growth improves the general purchasing power.

Recognizing that many households may be unable in the short/medium term to participate in collective, condominium-based arrangements or afford clean individual heating options, a program to reduce the barriers for the development and marketing of efficient wood stoves which are better designed for use in multi-apartment dwellings than the existing stoves.

However, the environmental implications of continued wood burning would need to be carefully assessed.

Low-cost insulation of buildings should be encouraged by systematically eliminating informational, institutional, financing and affordability barriers. There are many measures such as (re-)installation of windows and doors in the staircases, tightening of window frames, etc. that are very low-cost and/or have a short pay-back time that could partially be done by residents themselves. However, functioning condominiums may need to be in place to capture the full benefits of these measures.

The UHS does not propose a large-scale publicly funded heating infrastructure investment program, but intends to facilitate a community and private sector-led approach. Especially in the first two phases the actions proposed (see table below) are “soft”, concentrating on providing information to consumers and (potential) suppliers, eliminating legal, regulatory, and other institutional barriers to commercial and competitive heating options, enabling low-cost investment and setting the stage for more substantive investment in the third phase. This phasing is considered necessary since the heat market in Armenia today is largely dysfunctional, with most consumers fending for themselves and the municipal heat suppliers de facto bankrupt, unable to supply more than 10% of the population with a service that keeps deteriorating and unable to collect more than a small fraction of the cost of centrally supplied heat. The UHS therefore has to overcome considerable barriers, ranging from lack of information, income, and creditworthy consumer institutions (condominiums) on the consumer side, to the lack of information on technical options or an enabling legal and regulatory framework for commercial provision of heating services by private suppliers. The table below provides a more detailed description of the actions anticipated for each phase.

Project Description

The Urban Heating Project aims to support implementation of the UHS. The project design is consistent with the UHS phases. Specifically, the project preparation stage will coincide and support the objectives of the “survival” phase of UHS, while the actual project implementation stage will coincide with and support the objectives of the “recovery” and early “growth” phases. It is expected that by project completion the foundations for a sustainable development of the heating sector and for the “growth” phase of the UHS be laid (see table below for actions proposed in UHS and supported by the project).

The project would consist of four components:

- 1. Community mobilization and development (US\$ 0.9 million)** - technical assistance to enable households in multi-apartment buildings to effectively organize as condominiums or other forms of community-based groups and train them to manage their buildings and contract communal services. This will include: (i) changes in the legal and regulatory framework (transfer of common property of buildings from municipalities to condominiums, granting access by condominium representatives to apartments to prevent misuse of the services and disconnect non-payers, right and mechanisms to develop and apply cost-allocation rules, more straight-forward and simpler decision making and voting mechanisms with an increased role for apartment owners, clear definition of those eligible expenditures to be covered by fees and user charges and other contributions from all apartment owners, right and mechanisms to enforce articles of condominium agreement) to make condominiums more functional; (ii) establishment of special advisory centers and support for community activists for mobilizing urban households to form condominiums and other forms

of community organizations, assisting them with their start-up and establishing “rules-of-the-game” (including through providing standard condominium documents and procedures), resolving conflicts, and facilitating access to better utility and community services and to affordable finance and providing ongoing advice on legal, technical and financial matters; (iii) assistance in development of mechanism for provision of income support targeted at low-income and vulnerable households (through an enhancement of the family benefit program or alternative methods) to allow those households to meet their condominium obligations; (iv) sustained broad information campaign and public education program to inform the public about the need and benefits of the new approaches to community-led provision of communal services in general and heating in particular, explaining the institutional structure for building management, rights and obligations of members of collective organizations and legal matters, raising awareness about negative implication of some of the currently employed heating options; (v) promotion of low-cost energy efficiency/saving solutions in buildings, particularly common areas.

- 2. Supplier and financing institutions development (US\$ 0.8 million)-** technical assistance to create a qualified heat supply industry. This will involve: (i) changes in the regulatory framework to foster market-based and competitive provision of heating services, such as certification/licensing of suppliers and equipment, improved tariff-setting methodology for centralized heating options and economical deregulation for providers of decentralized options; (ii) introduction and promotion of efficient and cost-effective technical heating solutions and provision of ongoing support on technical, financial and legal issues; (iii) assistance in development of financial rehabilitation and commercialization program for viable district heating entities; (iv) policies and regulations for natural gas supply (cost-based tariffs, modern safety regulations, etc.) and institutional strengthening of gas supplier if needed; and (v) design of the financial mechanism (incl. terms and criteria) and identification of financial institutions/intermediaries to manage the financial mechanism and building of their capabilities for project and customer appraisal.
- 3. Improvement of heating and related building infrastructure (US\$ 19.3 million) -** including investments in block-level boilers and other autonomous/individual heating equipment, decentralized distribution systems, gas infrastructure necessary for operating boilers, equipment to measure and control heat supply and investments to increase the energy efficiency of buildings, particularly in the common areas. This infrastructure may be owned by private service providers, building resident associations, or other private/home-owner combinations. The project is expected to finance investments proposed by community organizations and/or private sector to provide heat for 500-1,000 buildings primarily in the four cities included in the UHS development- Yerevan, Gyumri, Charentsavan and Jermuk. This will involve 100,000- 200,000 residents, representing 15-30% of the population of the four-targeted cities living in multi-apartment buildings and not having access to operational centralized heating. This is based on the assumption that the project will finance \$10,000 - \$20,000 per building, about 30%-70% of total costs.
- 4. Support for project preparation and implementation (US\$ 2.0 million)** Technical assistance and logistical support for project preparation, implementation and supervision, including possibly contracting independent firms to monitor, evaluate and disseminate project performance data and lessons. (see Project Preparation and Piloting section for details).

The overall estimated project costs are US\$23 million, of which US\$10 million would be financed from IDA. Potential sources to finance the rest of the project costs include: households

and private service providers who would be required to put up their own funds to be eligible for receiving financing for their projects, the national gas company for the natural gas distribution infrastructure upgrade, the financial sector, and the government and/or municipalities that may co-finance some components of the project and contribute to the social support mechanism. Finally, various donors active in energy, infrastructure, and environment sectors and in community development are expected to contribute to project financing. GEF/UNDP and USAID in particular have already expressed such interest. Multilateral IFIs such as IFC, EBRD, and BSTDF will also be approached during project preparation to discuss private sector funding.

Description and Objectives of Project Preparation and Piloting

The project preparation phase is expected to last 18 months during which the foundations for a market-based provision of heating services would be laid, by effecting the necessary institutional (legal, regulatory and organizational) changes and embarking on an information/public awareness campaign emphasizing the advantages of community-based approaches to communal services in general and alternative heating services in particular.

The key elements of the project preparation phase will be the mobilization of a critical mass of condominium associations and the implementation of pilot projects for decentralized options to heat multi-residential apartment buildings. The objectives of the pilot projects will be to:

- > demonstrate technical, contractual and commercial arrangements for feasible options (although the main objective will be to test heating options based on autonomous building - level boilers,- limited funding would be allocated for gas-based individual heating options) and document associated costs and benefits;
- > demonstrate advantages of residents organizing in condominiums and other types of collective organizations;
- > mobilize private sector to provide heating services;
- > attract additional donor and non-concessional funding ;
- > help government to design and pilot social support scheme.

The selection of the pilot projects will be carried out on a competitive basis based on the proposals submitted by interested residents' organizations and private entrepreneurs. Technical assistance would be available to develop pilot project proposals.

This phase is proposed to be financed by PPF and includes the following sub-components:

- > Equipment (for small boilers and heat distribution, metering, temperature control and related gas network and building internal infrastructure) for pilot projects to be implemented in 4-8 buildings in each of the 4-targeted cities;
- > Technical assistance to document for at least one heating season costs and benefits, refine institutional arrangements, etc. to prepare advocacy materials to mobilize communities and other stakeholders, and initiate development of a market for decentralized heating services;

- > Technical assistance to design the financial mechanism based on assessment of existing financial infrastructure and capacities and to build capacity of financial institutions through which funds may be channeled to support the project, streamline laws and regulations, complete detailed feasibility studies, and prepare a project implementation manual.

Lessons learned from the project preparation phase would be used to refine and/or adapt the project design, and successful pilot project approaches would be scaled up during the implementation phase.

Exit Strategy And Sustainability

It is expected that by focusing on the elimination of barriers preventing consumer demand to generate a market-based supply response the project will facilitate the “Growth” phase of UHS and maximize sustainability. Successful completion of the first two phases of the UHS (“Survival” and “Recovery”) would demonstrate the effectiveness of the residents’ organizations in improving provision of heating services and other communal services and the attractiveness of the heating business. Thus the private sector would be willing, able and motivated to invest in further development of heating services. Other potential sources of financing such investments after the completion of the project include the local financial sector, other donor financing that may be leveraged both during project implementation and after its conclusion, and government (for example if it chooses to mobilize the financial resources for the implementation of the UHS through a revolving fund, some of the initially invested funds might be recovered by completion of the project and thus be available for re-investment).

Main Risks And Fall-Back Option

Critical risks and respective mitigation measures are listed in Section F of PCD. The following two risks are considered to be the most crucial for achieving the project objectives:
Reluctance of apartment residents to organize into condominiums or other forms of home-owner associations to contract communal services; and
Unwillingness of the private sector to get involved in commercial provision of heat services.

The project will include a number of risk mitigation measures, such as technical assistance to improve the legal and regulatory framework both for condominium associations and for private providers of decentralized heating services, and to build the necessary technical and managerial capacity to facilitate commercial provision of heating services, implementation of a public awareness campaign to promote organization of apartment residents and private sector participation, and pilot projects to demonstrate the technical, contractual and commercial feasibility of proposed solutions. Although the risk associated with the establishment of effective condominiums is substantial at the macro/country level, it is expected that a critical mass of households willing to organize to contract better heating and other communal services will materialize, sufficient to sustain successful implementation. Experience in Armenia and other transition countries have shown that households begin to effectively organize when they are then able to access financing for services they really want/need.

If despite of these risk mitigation measures pilot projects demonstrate that the autonomous (decentralized) heating option is not viable (due to the realization of above-mentioned risks), there will be a shift to the fallback option where more emphasis will be put on individual solutions. Costs and benefits of this option will be documented during the piloting stage. Simultaneously, however, other options will continue to be pursued.

Table: Actions proposed in the Urban Heating Strategy and supported by the Urban Heating Project (bold)

Phases	Survival (Y1+Y2)	Recovery (Y3-Y5)	Growth (Y6-Y25)
UHS Key Aspects			
Regulation/market stimulation	<u>Improve legal base for condominiums and adopt appropriate regulatory rules for different heat market segments</u>	<u>Stimulate and support embryonic heat market actors</u>	Market monitoring
Institutional	<u>Restructure CH companies / full cost recovery/ accountability</u> <u>Develop condominium assistance program and implement pilot projects, especially on demand side</u>	<u>Commercialization/ privatization of CH companies</u> <u>All collective heat consumers organized in condominiums and cooperatives</u>	- -
Social	<u>Develop social support scheme</u>	<u>Social support scheme operational</u>	Social support scheme is phased out over suitable period
Technical			
All heating systems		If systems viable, introduce individual control & cost-allocation devices	Individual control is commonplace
Remaining DH systems	Disconnect risers to reduce supply costs, reduce heated area, install meters	Development dependent on market demand and full commercialization of DH entities	Improvements of CH infrastructure based on market demand and commercial financing
Other	<u>Implement several building-level pilot projects</u>	<u>Simple demand side management measures implemented in buildings</u>	Comprehensive building insulation and improvements
Gas			Introduction of solar energy solutions for HTW

Infrastructure	<u>Coordinate with pilot projects</u>	<u>Upgrade as necessary to support heating investments</u>	
Promotional	<u>Implement comprehensive public awareness campaign</u> Promote improved wood stoves	<u>Continue information campaigns</u>	-
Financial	<u>Set up affordable financing schemes for condominium heat infrastructure and private heating service providers</u>	<u>Mainstream access to affordable financing by condominiums and private heating service providers.</u>	Phase out any sovereign guarantees associated with condo and heating supply financing schemes

DECREE 1384 N “ON REFORMS IN URBAN HEATING SYSTEM OF THE REPUBLIC OF ARMENIA

GOVERNMENT OF THE REPUBLIC OF ARMENIA

DECREE

September 5, 2002 No 1384 N

On Reforms in Urban Heating System of the Republic of Armenia

An unofficial translation

In order to make the heating system of the Republic of Armenia sustainable, to provide high-quality and affordable services to customers, to regulate environmental issues and to contribute to poverty reduction, the Government of the Republic of Armenia **resolves**:

1. To approve the draft of Urban Heating Strategy of Four Cities of Armenia (UHS) developed under of the Japanese PHRD Grant TF 025754, and to define basic concepts of the Government’s strategy in that sector in compliance with Annex.

2. To deem coordination and application of unified policy regarding projects (except for private requirements) executed in heating system of the Republic of Armenia by different institutions and organizations. In organizing public utilities, to recognize the key role of executing project aimed to support administration bodies of multi-apartment buildings, and for that purpose to reorganize the “Development of Urban Heating Strategy Project Management Board” into the “Heating and Administration Bodies of Multi-Apartment Buildings Support Projects Management Board” (Heating and Administration Bodies of Multi-Apartment Buildings Support Projects Management Board), as well as to reorganize the state institution “Termosupply Programs PIU” of the Ministry of Finance and Economy of the Republic of Armenia into the state institution “Heating and Administration Bodies of Multi-Apartment Buildings Support Projects PIU” of the Ministry of Finance and Economy of the Republic of Armenia.

3. To the Ministry of Finance and Economy of the Republic of Armenia:
 - a. to negotiate with the International Development Agency (IDA) for the preparation of the Investment Program aimed to implementation of UHS.

 - b. joint with the Minister of Nature Protection of the Republic of Armenia, to negotiate with United Nations Development Program (UNDP) and Global Environmental Fund (GEF) and other donor organizations for participation and technical assistance for implementation of the strategy UHS, in solution of energy-efficient measures and environmental problems.

4. To the “Heating and Administration Bodies of Multi-Apartment Buildings Support Projects” Management Board – under the PPF for the Heating Project or (and) grants to be involved, to assure development of programs for commercialization, institutional reformation, financial rehabilitation and asset privatization or private operation (including development privatization contracts drafts) of heating companies with state or community (in case of community leader request) shares, in Yerevan, Gyumri, Charentzavan and Jermuk cities, and until 15th May 2003

(as to the other cities - until 1st September 2003) to present a draft of the Decree of the Government of the Republic of Armenia recommendations on the mentioned issues.

5. To Mayor of Yerevan, Marzpets (Governors) of Republic of Armenia (in cooperation with community leaders):
 - to support “Heating and Administration Bodies of Multi-Apartment Buildings Support Projects” Management Board in organization of public awareness campaign
 - within 2 months, to present basic information to State Committee of Real Property Cadastre of the Government of the Republic of Armenia for determining the amount of estimated expenditures for preparation of plan of grounds (including yards), for determination of borders of boiler houses, heating networks and common-use areas of multi-apartment buildings to be transferred for ownership to the households of multi-apartment buildings, as well as for provision of certificates of title.
6. To the Head of State Committee of Real Property Cadastre of the Government of the Republic of Armenia after getting information envisioned by Clause 5 of Paragraph “b” within 1 month, to present proposal to the Government of the Republic of Armenia for determining the amount of estimated expenditures for preparation of plan of grounds (including yards), for determination of borders of boiler houses boiler houses, heating networks and common-use areas of multi-apartment buildings to be transferred for use to the households of multi-apartment buildings, as well as for provision of certificates of title.
7. To the Minister of Finance and Economy of the Republic of Armenia- until 1st November, 2002 to present proposal to the Government of the Republic of Armenia regarding the financial sources of activities mentioned in the Clause 6 of this decree.
8. To the Mayor of Yerevan, in cooperation with “Heating and Administration Bodies of Multi-Apartment Buildings Support Projects” Management Board:
 - a. by 1st December 2002, to examine and outline the list of boiler houses and heating networks and the ones which could operate autonomously to be immediately transferred for long term and free ownership to the households of multi-apartment buildings, based on the level of their preparedness to manage (operate) those units;
 - b. by 30th May 2003 to present to the Minister of Territorial Administration and Infrastructure Coordination the schedule of transferring boiler houses and heating networks which are subject to an independent operation from the system during 2003-2004 and the ones which are ready to operate independently for transferring to the households of multi-apartment buildings for free and long term ownership.
9. To Marzpets of the Republic of Armenia - to propose to the local self-governmental bodies to implement the activities envisioned by Clause 8 also in community owned heating systems and in cooperation with Heating and Administration Bodies of Multi-Apartment Buildings Support Projects Management Board by 30th May, 2003 to inform the Minister of Territorial Administration and Infrastructure Coordination about the results.
10. To the Mayor of Yerevan, Marzpets of the Republic of Armenia (in cooperation with Community Leaders)- within 6 months to provide office accommodation to registered and

actually functioning management bodies of multi-apartment buildings and quarterly present information to the Minister of Territorial Administration and Infrastructure Coordination.

11. To “Heating and Administration Bodies of Multi-Apartment Buildings Support Projects Management Board” to assure study of the possibility and efficiency of providing public utilities through one unified commercial organization and in case of positive conclusion, to prepare standard draft contracts (with the standard project package enclosed to it) to be entered between:

- a. the commercial organization and management bodies of the multi-apartment buildings
- b. the commercial organization and companies in charge of water supply, sewerage, electricity distribution, gas supply and heating companies.

12. To the Minister of Urban Development of the Republic of Armenia within 3 months, to assure introduction of alterations into urban development standards for multi-apartment buildings with different owners, and to determine that:

- a. the heating system should allow in each apartment to regulate heat consumption individually by control valves on every radiator and meter consumption.
- b. block-meters and shut-off valves for drinking water, hot water and heat supply of the building (entrance) should be installed in a separated locked area.

13. To define, that:

- a. consultancy and other technical assistance provided by the Government to management bodies of multi-apartment buildings, as well as funds for implementation of pilot projects shall be provided in form of grants (including TF 025754 grant agreement);
- b. technical assistance to commercial organizations involved in the production, transportation, distribution and realization of heat may be provided out of charge from the sources of grants received by the Government of the Republic of Armenia according to the decision of the “Heating and Multi-Apartment Buildings Support Projects” Management Board;
- c. cross subsidies of heating companies from the State Budget or from electricity, natural gas or other suppliers shall not be allowed.

To the Minister of Finance and Economy of the Republic of Armenia with Minister of Energy of the RA and Head of Energy Regulatory Commission of RA, to discuss liberalization of autonomous heat tariffs characterized in outline of UHS, allowing operation of such boiler houses without state licensing, and limiting the state regulation only to set up safety and environmental standards and arranging on-site supervision to assure compliance with those standards, as well as discuss the possibility of splitting heat tariffs for centralized heating into fixed and variable components, and to present a draft of the alterations to be made in the corresponding Laws of the Republic of Armenia.

15. To the Minister of Nature Protection - to negotiate with interested donor countries and international organizations aimed to implementation of projects for increasing the energy-

efficiency of heat supply and forest rehabilitation in the frames of convention “On Climate Change”.

16. This Decree comes into force from the date of publication.

Prime Minister of the Republic of Armenia
A. Margaryan

Improving the Energy Efficiency of the Urban Heating and Hot Water Supply in Armenia

Response to the Council Comments

1. Comment of the German Council member

“Measures on increasing the heat efficiency in the housing sector are usually very effective in terms of CO₂-emission reduction per unit of cost. There are options for cooperation/coordination with local GTZ-projects, but they can be considered during project execution. The topics of these projects are urban development and the promotion of municipal self-help institutions in selected municipalities the promotion of small and medium-sized private-sector enterprises (SMEs) in regard to trade, production and services”

Recommendation:

It is recommended to take the above comments into account during further project planning and implementation."

UNDP Response: The comment of the German Council member has been addressed in the project document in the section I b. “Project Strategy”

2. Comment of the U.S. Council member

“The U.S. reviewed all the May 2003 GEF work program projects keeping in mind the GEF-3 replenishment agreement that *“all projects must include clear and monitorable indicators, plans for monitoring and supervision, and identification of risks and other factors designed to improve quality at entry and to maximize impact. There should be a transparent system for monitoring of these indicators and outcomes and for informing the Council on an annual basis.”* From reviewing the project summaries, the following projects fell short of expectations:

.....

Armenia Energy Efficiency: Log frame does not have many quantifiable indicators. Means of verification are from project reports, with no indication of who was responsible.”

UNDP Response: The comment of the U.S. Council member has been addressed by complementing the log frame with a more specific “Monitoring and Evaluation Plan” attached to the project document (Annex E).

SIGNATURE PAGE



Country: Armenia

UNDAF Outcome 4.1: Government growth strategies and plans are based on the principles of sustainable development.

Expected CP Outcome: Access to sustainable energy services is increased.

Expected CP Output: Legislative frameworks for improving energy efficiency are introduced.
New technologies for renewable energy are introduced.
Municipal heat and hot water systems are rehabilitated.

GEF Focal Area: Climate Change

GEF Operational Programme: Operational Programme #5: "Removal of Barriers to Energy Efficiency and Energy Conservation"

Implementing partner: Ministry of Nature Protection of the Republic of Armenia

Project Title:	Armenia – Improving the Energy Efficiency of Municipal Heating and Hot Water Supply
Project ID:	00035799
PIMS Number:	1273
Project Duration:	4 years
Management Arrangement:	NEX

Budget:	2,950,000USD
Allocated resources:	
GEF:	
• Project:	2,950,000USD
• Previously approved PDF B:	210,000USD

Agreed by Government:

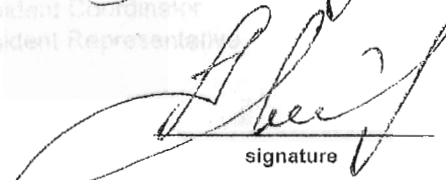
Vardan Ayvazyan
Minister of Nature Protection
Republic of Armenia


signature

21.01.05
date

Agreed by Implementing partner:

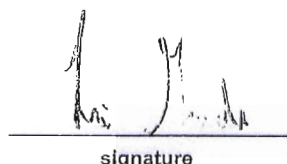
Vardan Ayvazyan
Minister of Nature Protection
Republic of Armenia


signature

21.01.05
date

Agreed by UNDP:

Lise Grande
UN Resident Coordinator
UNDP Resident Representative


signature

21 January 2005
date