



Republic of Armenia

United Nations Development Programme

PROJECT DOCUMENT

Project Title: Improving Energy Efficiency in Buildings

UNDAF Outcome(s): 4. Environment and disaster risk management is integrated into national and local development plans

UNDP Strategic Plan Environment and Sustainable Development Primary Outcome: Armenia is better able to address key environmental challenges including climate change and natural resource management

Expected CP Outcome(s):
4.1 Armenia is better able to address key environmental challenges, including climate change and natural resource management

Expected CPAP Output (s)
4.1.4 National and local capacities to develop innovative policies and practices to address climate change mitigation and adaptation strengthened.
4.1.5 Innovative policies and practices for environmentally sound, energy efficient technologies and cleaner production developed and implemented

Executing Entity/Implementing Partner: Ministry of Nature Protection

Implementing Entity/Responsible Partners: Ministry of Nature Protection, Ministry of Urban Development

Brief Description

The objective of the GEF full size project is to reverse the existing trends and reduce consumption of electrical and thermal energy and associated GHG emissions in new and restored, primarily residential buildings in Armenia. It will do this by creating enabling regulatory environment, skills and capacity among industry professionals to introduce the principles of integrated building design in Armenian construction practices from the stage of building design through construction to maintenance of the buildings. The support to be provided by the project will combine development of a new regulation (EE building codes and certification scheme) with the training of professionals, demonstration of integrated building design and stimulating manufacturing of new EE materials and equipment.

The project will be implemented under the UNDP-led GEF Global Framework for Promoting Low Carbon Buildings with a primarily focus on two thematic approaches promoted by the Global Framework: a) promotion and increased uptake of high quality building codes and standards; and b) developing and promoting energy efficient building technologies, building materials and construction practices. The coordination offered by the global program will help Armenia to learn from experiences and best practices from countries with similar EE building projects.

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ACRONYMS

AWP	Annual Work Plan
CEO	Chief Executive Officer
CEN	European Commission for Standardization
CIS	Commonwealth of Independent States
EE	Energy Efficiency
EPBD	EU Directive on Energy Performance in Buildings
EU	European Union
FSP	Full-Sized Project
GEF	Global Environment Facility
GDP	Gross Domestic Product
GHG	Greenhouse gases
GoA	Government of Armenia
GOST	National standard
IBDA	Integrated building design approach
MNP	Ministry of Nature Protection of RA
MUD	Ministry of Urban Development of RA
MSNs	Intergovernmental construction norms
M&E	Monitoring and Evaluation
NGO	Non-governmental Organization
NPD	National Project Director
PIF	Project Identification Form
PM	Project Management
PMT	Project Management Team
PPG	Project Preparation Grant
QA/QC	Quality control/Quality assurance procedures
RE	Renewable Energy
RoA	Republic of Armenia
SNiP	Building Standards and Rules (building codes)
STAP	Scientific and Technical Advisory Panel
TL	Task Leader
tCO ₂ e	Tons of CO ₂ equivalent
toe	Tons of oil equivalent
ToR	Terms of Reference
UNDP	United Nations Development Programme
UNDP CO	United Nations Development Programme Country Office
UNFCCC	UN Framework Convention on Climate Change
USAID	United States Agency for International Development
USD	the U.S. Dollar

I. SITUATION ANALYSIS

Context and global significance

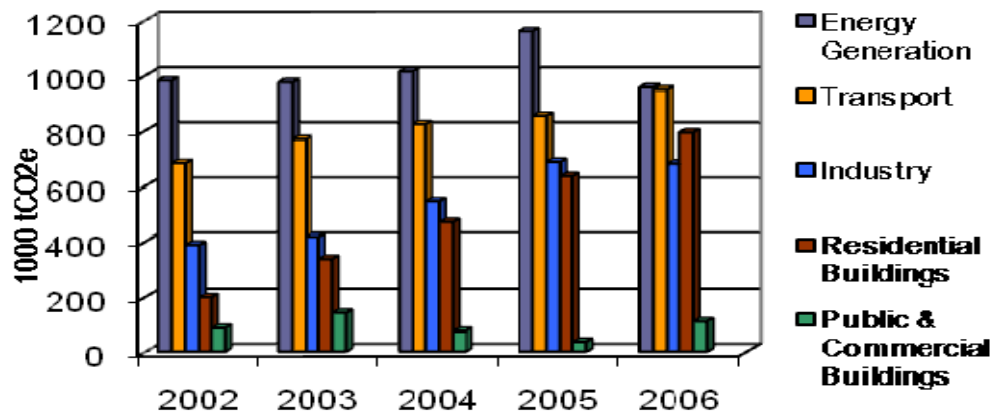
Making use of energy efficient technologies and practices in new and existing buildings could save as much as 34 percent of the projected primary energy consumption by the world's buildings by 2020. This estimate would represent a reduction of 52 to 57 EJ (3.8 to 4.7 billion tonnes of CO₂) by 2020 and a reduction of 79 to 84 EJ (5.8 to 6.9 billion tonnes of CO₂) by 2030. The potential global energy savings in buildings by 2030 are equal to the current energy consumption for all uses in Europe.¹

The project approach of institutionalizing improved energy efficiency in buildings through building codes, construction materials certification, training, and demonstration directly contributes to the pursuit of *Millennium Goal Number 7: Integrate the principles of sustainable development into country policies and programmes and reverse the loss of environmental resources.* The project approach also builds on one of the key areas of the *UNDP Armenia Country Programme: to "strengthen synergies of environmental, governance and socio-economic issues to ensure integrated solutions."*

Background

65% of Armenia's population of 3.23 million inhabitants lives in urban areas. There are over 400,000 apartments with a total area of 25 million m² in multi-apartment buildings. The largest portion of the urban housing stock is between 30 and 60 years old, and it typically has poor thermal characteristics and is poorly sealed.

Fig. 1 GHG emissions trends in main energy-intensive sectors of economy



(Source: *Second National Communication of Armenia to the UNFCCC, 2009*)

Without exception, all old buildings require some type of repairs, and 11% of the buildings are in urgent need of reconstruction. Buildings represent the largest energy end-use sector, accounting for 35.5% of electricity and 25.3% of gas consumption in Armenia (a major portion of both is consumed to cover the heating load, due to the absence/collapse of the centralized district heating system and switching to the individual heating options),² and this sector offers the single largest and most cost-effective opportunity to improve energy efficiency: 40% of the national energy saving potential is in the buildings, an equivalent of 402,000 toe or 944,000 tCO₂e of GHG emission reductions annually.³ The buildings sector is also the second fastest growing sector (after

¹ Urge-Vorsatz et al. (2006) in *Realizing the Potential of Energy Efficiency*, UN Foundation (2007)

² Ministry of Energy, Calculation Center (2006 report).

³ National Programme on Energy Saving and Renewable Energy of Republic of Armenia (2007).

transport) in terms of energy use and GHG emissions (Fig. 1): in 2002-2005 consumption of natural gas in residential and public buildings grew by 206% and 85% respectively.

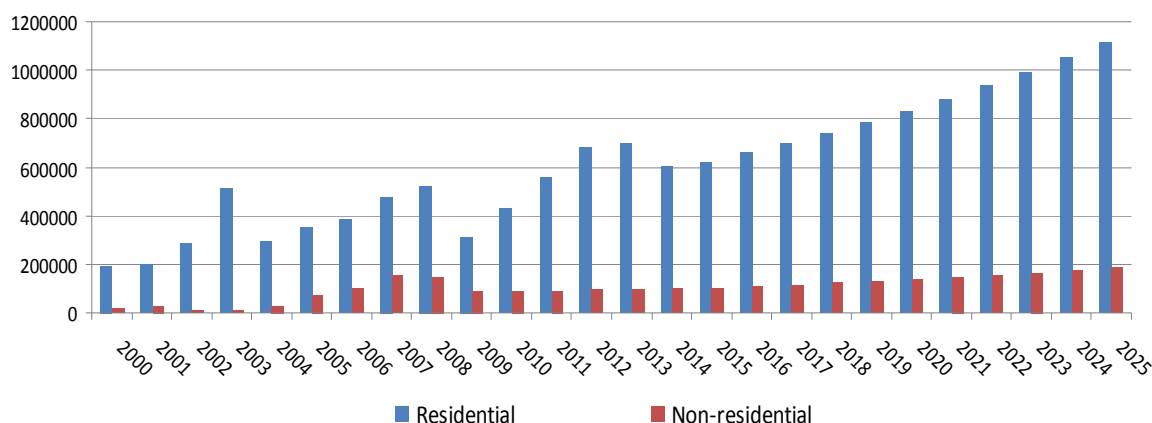
Growth in emissions from the building sector results in part from a construction boom that began in Armenia in early 2000, when construction volume began to increase on average by 15-20% annually. The GDP has been growing rapidly since 2001 at above 10% annually, with the construction sector contributing 28-30% of GDP in 2008. An expert estimate of the multi-apartment residential stock growth rate is given in Table 1. In addition, there is a stated government commitment to implement the Program for restoration of the areas that suffered from the disastrous 1988 earthquake. In November 2008, the Prime Minister declared the full reconstruction of the earthquake zone was among the government’s priorities and pledged 77 billion Drams (approximately USD 250 million) for finalizing the construction of new housing for the 75,000 people still living in temporary dwellings. The state-supported program will construct over 460,000 m² of residential stock during the 2009-2013 in the northern regions of Armenia.

Table 1: Multi – apartment building stock growth rate in Armenia

Year	2000	2001	2002	2003	2004	2005	2006	2007	2008
Space (m ²)	194000	197000	285000	512000	294000	353000	386000	480000	521000
Growth rate, %	-	2	45	80	-43	20	9	24	9

Source: National Statistical Service of the RA

Fig 2: Building stock growth rate projections, in Armenia, m²

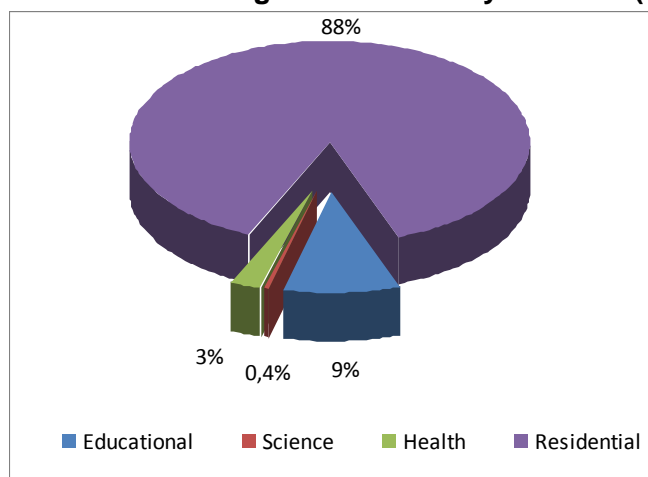


Note: The 2000-2008 data is based on statistical department data. In 2009, the growth rate decreased by almost 40 % because of the global financial crisis; the 2010-2024 growth trend is assumed to be 2% annually in post crisis 4 years and later will grow up to 6%, linked to the anticipated GDP growth rate. The construction level of years 2010-2013 include the residential construction that will take place under the state-supported earthquake zone restoration program.

Due to Armenia’s markedly continental climate with long heating season and winter average temperatures around -5°C, energy consumption and GHG emissions in Armenian building sector are mainly associated with space heating. The introduction of improved thermal insulation of the buildings can noticeably improve energy performance in buildings, resulting in 30-40% energy savings. However, construction continues to proceed according to old Soviet practices and norms whereby little or no attention is paid to the energy performance characteristics of the buildings, and energy efficiency is not considered, let alone accounted for, in the design and construction process, resulting in excessive energy consumption and increasing GHG emissions.

Keeping in mind that 88% of buildings in the total non-commercial building stock of Armenia is in the residential sector (Fig 3), this project is directed towards enhancing energy efficiency in residential buildings. However, it is important to note that activities supporting a new, energy-efficient building code will cover not only construction and capital renovation of residential but also non-residential buildings, thus leading to wider replicability.

Fig 3: Armenian non-commercial buildings distribution by number⁴ (2008)



Furthermore, climate change projections for Armenia indicate a continuous rise in summer temperatures (ranging from 2.1⁰C to 8.4⁰C in the year 2090⁵), leading to increased demand for air-conditioning in summer, a trend that is already being observed (in 2008, the number of imported air conditioning units -- 19,000 -- was 3.5 times higher than in 2004). The increased use of air conditioning also contributes to increasing energy consumption and associated GHG emissions.

The basis for long-term energy policy in Armenia is the **Strategy for Development of the Energy Sector within the Context of the Economic Development of the Republic of Armenia (2005)**, which defines ways of creating a safe, efficient and sustainable energy sector in Armenia.

The strategy covers the period until 2025 and addresses the following issues: contribution to sustainable economic development of Armenia and energy security, including the classification of imported and local energy reserves; maximum utilization of renewable and nontraditional sources of energy; promoting energy saving; and environmentally-friendly energy supply in line with the international commitments of Armenia.

Chapter 5 of this strategy specifically defines activities related to energy efficiency, including cost-effective measures for improving energy efficiency in Armenia, new building standards for new construction as per the Law on Energy Conservation and Renewable Energy, the replacement of obsolete equipment with more efficient equipment, and a energy labeling program for new appliances.

The National Program for Energy Saving and Renewable Energy (2007) provides an assessment of the energy saving potential in power supply, heat supply and gas supply systems; in industrial production, in the transportation, residential, and public sectors; and it also assesses the potential of renewable energy and measures for achieving potential energy savings.

Specifically, the National Program on energy saving and renewable energy has the following objectives:

- Plan the development of energy resources of the country in parallel to the advancement of energy saving and renewable energy.

⁴Note: more detailed distribution by sectors is not available due to absence of data in the corresponding national statistics.

⁵“UNDP Climate Change Country Profiles” <http://country-profiles.geog.ox.ac.uk>

- Align state policy on development of fuel-energy resources with the development of the economy, in order to guarantee the sustainable development of the country through introduction of regulatory reforms and increase of public participation.
- Direct the finance and credit policy of the country to energy saving and renewable energy development, providing equal affordability conditions for the capital investments.
- Establish and maintain an active market structure through introduction and explanation of energy efficiency benefits, providing an effective choice mechanism for market participants.
- Organize, promote and provide equal accessibility of modern technologies for all members of society (companies).

The National Security Strategy (2007) also prioritizes national energy security issues and defines main directions in energy sector development.

Energy efficiency is regulated by two main laws: the **Law of the Republic of Armenia on Energy** (2001) and the **Law on Energy Saving and Renewable Energy** (2004). The laws define the main principles of state policy in the energy sector:

- effective use of local energy reserves and alternative sources of energy and application of economic and legal mechanisms for that purpose;
- ensure the energy independence and security of Armenia;
- create new industries and organize new services, implement targeted national programs and apply new technologies in order to promote the development of renewable energy and energy saving;
- promote energy-efficient and energy-saving technologies;
- reduce environmental impacts.

The most important law related to residential construction is the **Law on Urban Development**. It establishes the main provisions regarding urban development and it regulates the relationships between the various entities in the field. The main responsible body for implementation of the policy in the construction sector is the Ministry of Urban Development of RA.

The two primary institutions relevant to the residential energy efficiency sector are:

- The **Ministry of Urban Development (MUD)**, which oversees the implementation of the Law on Urban Development. The MUD is also the main governmental body in charge of implementation of all state-funded construction programs. Nearly all of this construction is related to the Program for restoration of the areas that suffered from the disastrous earthquake in 1988.
- The **Ministry of Energy and Natural Resources (MENR)** is the main responsible authority for energy policy development and implementation (including energy efficiency).

At the level of building codes, existing building codes (norms) can be divided in the following three groups: codes developed in the Soviet period (SNiPs); building codes developed during the 1990-2000 period by Armenian experts; and Intergovernmental construction norms (MSNs) developed by Intergovernmental Normative-Technical Commission on Standards and Certification in the Building Sector of the CIS. The latter were voted for, but not yet adopted by Armenia, including MSN 2.04-02-2004 "Thermal Insulation of the Buildings."

For implementation of a real estate development project a developer gets architectural-planning order from bodies of local self-government. The order is to be in compliance with local urban development plans. Mandatory conditions, requirements and limitations for the design and construction are set up by mentioned order.

Design documents are elaborated based on the architectural-planning order and technical terms for engineering infrastructure design, construction and maintenance. Architectural-construction design documents have to be in line with the acting building codes (norms).

Once the design documents are ready they pass audit according to the procedure set up by government. Organizations carrying out design audit are licensed organizations (licenses are granted by the MUD), which conduct design audit based on contracts either with the developers or the designer. Developers are obliged to get approvals on design documents from different interested parties (e.g. fire protection inspection, etc.)

After getting the design audit report the developer submits it along with design documents to the local government administration. The latter reviews the whole package of documents and issues a construction permit, which also sets a timeline. In case of non-compliance with the existing building codes and regulations, the local government rejects the whole package and returns for revision and re-submittal.

During construction the developer is obliged to ensure construction quality technical control (through organizations licensed by MUD), and design field supervision for the construction. Finally the developer should prepare the documentation of completed construction for the final acceptance by the commission. Commission consists of representatives from the MUD, developer, builder, designing organization and local government. The procedure of construction quality technical control, design field supervision and building's commissioning are regulated by legal acts set up by the government.

Barriers analysis

The energy efficiency study conducted by World Bank in Armenia (completed in 2008) identified a number of legal and regulatory barriers to energy efficiency investments, including absence of EE standards, public procurement inflexibility, inadequate gas tariff structure, lack of regulatory incentives for energy efficiency in utilities.

The building construction is carried out by existing building codes. The current building codes were not designed with energy efficiency in mind. For example, the code pertaining to the thermal resistance of building envelope elements bears non-binding recommendations. Most designers use a Soviet-era code (SNiP) dating from 1979, which sets the minimal thermal resistance requirements (R values) for the building envelope elements in accordance with sanitary norms. The building codes "Thermal physics of the building envelope" (1995) were adapted based on the corresponding Russian codes, and they do not provide IBDA, building energy performance limitations and building energy passport form.

In summary, the key barriers to realizing gains in energy efficiency in the housing sector are presented in table below;

Table 2: Barrier Analysis⁶

Description	Barrier Type	Priority	Project response
<i>Outdated building standards:</i> Current building codes do not explicitly address energy performance and integrated building design approach, and codes do not encourage the efficient use of energy in the buildings that are currently built.	Legal/ Regulatory	<i>Very High:</i> Efficient codes that are enforceable and economically viable can move the entire sector onto a more efficient curve. Without them, most designers and builders will lack incentives to produce more efficient buildings.	<i>Output 1.1</i> supports the revision/development of national building codes that provide guidelines on energy performance of new buildings and buildings undergoing capital reconstruction. The implementation of the new codes is expected to result in a minimum increase in the efficiency of new buildings of 30% compared to current practice in most cases.
<i>Low enforcement capacity:</i>	Institutional/ regulatory	<i>Very high:</i> Without audits, there are no	<i>Output 1.3</i> supports the development of an energy

⁶ Barrier analysis was done using a comprehensive review of literature, expert confirmation, and interviews with stakeholders.

Description	Barrier Type	Priority	Project response
<p>Energy audits are not conducted to determine the actual performance of buildings and their compliance with building codes.</p> <p>Construction materials are not certified for energy performance.</p>	<p>Institutional/ awareness</p>	<p>readily-available data on energy performance in buildings. Without this information, it is not possible to assess code compliance or visibly demonstrate the economic benefits of energy savings.</p> <p><i>High:</i> Uncertified materials will make it very difficult for architects and builders to ensure that their buildings are code-compliant and attain estimated energy performance.</p>	<p>passport program and the use of audits to determine the actual energy performance of buildings. This output will also lead to the implementation of a planned audit program and support compliance with the adopted new codes. It will also strengthen training and capacity of enforcement officials so that energy audit findings can be enforced (i.e., non-compliant buildings will not receive occupancy permits). The demo building in <i>Component 4</i> will also receive a passport to make its savings more visible.</p> <p><i>Component 2</i> will put into place a system for testing and certifying construction materials in a cost-effective way. It will also establish performance requirements for materials produced locally or imported, which will allow builders and designers to make better-informed decisions about the performance of the construction materials used in new buildings.</p>
<p><i>Low capacities of building sector players:</i> Lack of skills among building design and construction professionals that are necessary to integrate energy efficient technologies and design techniques into their work.</p>	<p>Information/ awareness</p>	<p><i>Very High:</i> Even if codes are strengthened, compliance will not be possible without architects and builders who can design more-efficient, code-compliant buildings.</p>	<p><i>Component 3</i> will provide training for architects and engineers in application of enhanced regulations and integrated building design.</p> <p><i>Component 4</i> will provide hands-on training for architects and engineers in integrated building design through the design and construction of the pilot building.</p>
<p><i>Immature market for EE products and services:</i> Outdated technologies and inefficient materials in use by a large number of construction and maintenance companies.</p>	<p>Information/ awareness</p>	<p><i>High:</i> Current construction practices directly influence the performance of building stock, but they ultimately stem from a lack of an efficient building code, lack of efficient design capacity, and low levels of information on materials performance.</p>	<p>The new building codes and building passports developed in <i>Component 1</i> will force companies to use more efficient materials. <i>Component 2</i> will also establish performance requirements for materials that will allow builders and designers to make better-informed decisions about the performance of construction materials used in new buildings. Finally, training on code compliance and integrated building design will give employees the information they need to select more efficient materials.</p>
<p><i>Low awareness of EE benefits and opportunities in buildings:</i> low level of awareness among building owners, real estate agencies and</p>	<p>Information</p>	<p><i>Medium-High:</i> While improved codes will mandate increased efficiency, this perception could keep architects and builders (and buyers) from</p>	<p><i>Component 4</i> will visibly demonstrate that a «typical» building can become much more efficient without being significantly more expensive. The passport program introduced under <i>Component 1</i> will also clearly</p>

Description	Barrier Type	Priority	Project response
occupants about the operational costs and potential energy and money saving; perception that full compliance with efficient building codes and energy-efficient buildings would be prohibitively expensive in Armenia.		considering buildings that exceed the energy performance requirements in the code and moving the market forward.	indicate lifetime savings, and it will form the basis for targeted outreach to real estate professionals and buyers. The certification and QA/QC programs supported in <i>Component 2</i> will also allow for better decision-making regarding the use of locally-produced and imported materials to optimize costs while improving efficiency.
<i>Inflexible investment decision-making practices:</i> First-cost procurement practices, whereby decisions on construction projects are made on the basis of initial construction costs instead of life-cycle costs, discriminate against efficient buildings, which may have higher up-front costs but which have lower operating costs.	Legal/Regulatory	<i>Medium-High:</i> This is a significant barrier for state sector construction but less significant than it would be in a country where state-funded construction formed a larger share of the market.	The World Bank – GEF project focusing on the buildings sector in Armenia will reform procurement legislation in order to remove this barrier. In addition, the Commission formed under <i>Component 1</i> (Activity 1.1.1) of this project will support these reforms, and the project as a whole will support the implementing agency, MUD, in addressing the issue. <i>Component 4</i> demonstration will also enable accurate estimation of EE building benefits over its operation during project lifetime.

Stakeholder analysis

Table 3 summarizes the activities of other key stakeholders in the field of energy efficiency in the residential sector. Stakeholder consultations during the preparation of the project included one-on-one meetings and a stakeholder consultation workshop, which is summarized in Annex B of this document.

The primary means of stakeholder coordination will be via the Project Steering Committee (PSC – see Section III.B. for more details on this arrangement), which will provide an official, ongoing forum for coordinating the work of various government agencies and other donors. In addition to work through the PSC, project staff will maintain regular communication with the World Bank mission in Armenia regarding their complementary work on efficient public buildings and will work with the World Bank PIU in order to ensure very close coordination on the revision of procurement legislation. Project staff will also work with the Delegation of the European Commission in Armenia regarding support for training in EU standards and legislation relevant to the buildings sector.

Table 3: Key stakeholders in the implementation of the proposed project

Partner	Joint activities/complimentarity
Ministry on Nature Protection	<ul style="list-style-type: none"> ▪ Coordination of the project activities in line with objectives of UNFCCC ▪ Development of GHG emission reduction assessment manuals and promoting the GHG inventory reporting practices in the buildings sector
Ministry of Urban Development	<ul style="list-style-type: none"> ▪ Design and enforcement of new building codes and standards; ▪ Coordination and supervision of construction/reconstruction of the residential buildings in six cities ▪ Direct coordination and cooperation on the demo building in Gyumri
State Urban Inspectorate under	<ul style="list-style-type: none"> ▪ Revision of the inspection procedures to bring them in line with requirements of the new revised code

the Ministry of Urban Development	<ul style="list-style-type: none"> ▪ Participation in the professional trainings ▪ Capacity building for ensuring the enforcement framework of revised code
Ministry of Energy and Natural Resources	<ul style="list-style-type: none"> ▪ Development and enforcement of the legal base, methodologies and procedures for Energy Certification Scheme (Energy Passport)
World Bank	<ul style="list-style-type: none"> ▪ Implementation of “Armenia Energy Efficiency” project ▪ Raising awareness on energy efficiency ▪ Strengthening the institutional and regulatory frameworks for promoting energy efficiency in public procurement process ▪ Energy efficiency investments in public buildings
USAID/EE Energy	<ul style="list-style-type: none"> ▪ Information and awareness-raising activities ▪ Exchange of data and analytical studies
European Union	<ul style="list-style-type: none"> ▪ Support for harmonizing legislation with the aquis, including legislation related to European norms and standards (CEN) and the EU Directive on Energy Performance in Buildings (EPBD)
Armenia Renewable Resources and Energy Efficiency Fund	<ul style="list-style-type: none"> ▪ Financing renewable energy and energy efficiency projects ▪ Promotion of the development of EE market in Armenia ▪ Development of activities focused on energy security and reliability of energy systems
Builder’s Union of Armenia Architect’s Union of Armenia	<ul style="list-style-type: none"> ▪ Organization of trainings on EE construction materials and technologies , development of advertising materials, exhibitions, support with publication in media, awareness rising
Yerevan State University of Architecture and Construction	<ul style="list-style-type: none"> ▪ Organization of the training and targeted educational courses on IBDA and energy audit procedures
National Institute of Standards	<ul style="list-style-type: none"> ▪ Development of procedures for licensing of independent verifiers in the sphere of EE materials certification and labeling
Accredited laboratories for construction and construction/insulation materials QA/QC	<ul style="list-style-type: none"> ▪ Participation in the trainings on the building energy audit as well as construction/insulating materials testing and certification ▪ Preparation of the procedures for the building energy audits and passportization

Baseline analysis

The following assumptions characterize the *business-as-usual scenario* in the buildings sector in Armenia:

1. The *speed and the significance of improvement* in the national energy-efficiency building codes. According to the MUD regulations, construction norms should be updated every five years based on the latest know-how and best building practices. In reality, however, the only code that was adopted in post-Soviet era is the 1995 code (amended on 1998 with approval on 2001) with no limitations on energy performance and no IBDA. No EE related code was revised/adopted in the last 10 years, and without the project it is quite unlikely that it will happen soon. However, in order to be conservative, it is assumed that energy requirement for heating in new buildings is expected to be improving at the rate of 1% per year starting in 2011 (i.e. going down from the current average of approximately 160 kWh/m²/year to 152 kWh/m²/year in 2015 and further to 138 kWh/m²/year by 2025).
2. The *compliance rate* for building codes. Relatively low compliance of buildings with building codes is a worldwide problem encountered not only in developing and transition economies but also in developed ones. For the purpose of calculations, it was assumed that in BAU scenario the buildings to be built at least comply fully with the minimal sanitary norms on EE (which actually often is not the case).

3. *Building construction volumes*: Armenia has 21,778 multi-unit residential buildings, with a total of 429,500 apartments, accounting for 25 million m². The city of Yerevan accounts for approximately half of all multi-apartment housing in Armenia by floor space. Annual construction volumes growth average rate was around 12% before the 2008. In 2009, the growth rate decreased by almost 40% because of the global financial crisis; the 2010-2024 growth trend is assumed to be 2% annually in post crisis years and later will grow up to 6%, linked to the anticipated GDP growth rate.⁷. The state supported program for 2010-2013 on earthquake zone restoration (which envisages commission of some 460,000 m² of residential housing in the earthquake zone) was also taken into account and calculated separately.

In a business-as-usual scenario, state- and commercially-funded construction and renovation in Armenia will be implemented using outdated building norms and practices and with no regard given to energy efficiency, resulting in excessive energy use. GEF assistance is requested to help overcome a number of barriers which currently prevent adoption of more energy-efficient construction practices in buildings. Under the BAU scenario, the annual emissions from the Armenian building stock would grow some 70% from current level of around 1 MtCO₂eq to over 1.7 MtCO₂eq by 2025.

The alternative scenario – *the GEF project scenario* -- relies on a set of actions and expected outputs as described earlier in order to improve energy performance in buildings, enhance code compliance, build necessary capacities and provide relevant demonstrations, which are expected to help revise the existing trends and reduce energy consumption and associated GHG emissions in residential buildings in Armenia.

With the GEF support, the existing building codes and standards will be enhanced and mandated, as well as integrated building design approach will be applied to new construction leading to up to a 40-50% reduction in specific energy consumption for heating in residential sector from the current average of 160 kWh/m² year down to 96 kWh/m² year by 2013 for improved code component and down to 80 kWh/m² year for IBDA component by 2012.

The compliance level in 2015 is assumed as following: 50% full compliance, 20% minor non-compliance (specific energy consumption 10% greater than the level mandated by code requirements) and 30% major non-compliance (specific energy consumption 50% greater than the level mandated by code requirements). This trend will change over 10 years (2015-2024) towards 70% full compliance, 10% minor non-compliance and 20% major non-compliance.

Table 4: Factors Influencing the Energy Performance of Buildings: A Comparison of the Business-As-Usual Scenario with the Project Scenario

Factor Influencing Energy Performance	Business-As-Usual	GEF Project Alternative
Quality of the Design: level of the designing solutions, their progressiveness, the use of efficient technologies and experience.	<p>Only a few architects and engineers would become familiar with IBDA concepts and supporting technologies; most would not consider energy performance when designing new residential buildings or drafting plans for capital reconstruction.</p> <p>Building codes would not incorporate provisions for integrated building design, such as the choice of location, requirements for thermal insulation in the roof, wall and floor of the building, the use of more energy efficient building materials, design and</p>	<p>Local experts estimate that only adequate internal and external insulation could save up to 30% of energy, while incorporating all available options in building design (application of IBDA) could provide for up to 60% of energy savings. Training for architects and engineers provided under the project would allow them to capture these savings.</p> <p>The adoption of the MSN building code would incorporate energy performance into building codes. The enforcement of existing national</p>

⁷ Armenia: Second National Communication on Climate Change to UNFCCC

Factor Influencing Energy Performance	Business-As-Usual	GEF Project Alternative
	technologies for heat and water supply and lighting systems, as well as the use of renewable energy sources.	codes would require the use of more efficient technologies and practices.
<u>Quality of Building Materials</u> : technical properties/ specifications meeting demands of the design. For example, strength/rigidity for load-bearing structures; heat- and sound-proofing properties for walls.	Builders and designers would continue to lack information on the energy characteristics of locally-produced insulation, doors, windows, and heating systems. They would also have to rely on uncertified claims about the performance of the vast majority of imported building materials. Auditing equipment would continue to be difficult to obtain and use.	Independent testing would provide builders and designers with clear information on the energy properties of both domestic and imported construction materials in key areas. Auditing equipment would be made available to assess the performance of the building envelope as a whole.
<u>Quality of Construction Work</u> : design demands, building codes requirements specification and technical instructions. It depends on qualification of workers and technicians-and-engineers, quality of appliances and tools, applied materials and products, maintenance of technological sequence of works.	The energy performance of buildings would not be monitored upon commissioning. Occupancy permits would be issued regardless of whether the buildings met thermal performance standards. Buyers and occupants would not be aware of the energy performance of their residences. Real estate professionals and the public at large would continue to see energy efficiency as a “luxury” rather than as a means of reducing heating bills.	Building audits and the introduction of a national building passport system would hold builders accountable for the performance of their buildings. Trained personnel would be able to assess energy use in buildings and to enforce building codes. A targeted outreach campaign would link energy efficiency and financial savings in the minds of Armenian real estate professionals, apartment buyers, and the public at large.

The combined impacts of the project-supported interventions and ensuing replications within 10 years of GEF project influence period are estimated to enable cumulative energy savings in the Armenian residential buildings sector of around 7,441 GWh (calculated over 20 years of useful lifetime of investments). Thus, the GEF alternative GHG scenario shows considerable deviation below the baseline and is estimated at around 1.35 million tons CO₂eq of cumulative emission reductions (over 20 years), assuming CO₂eq emission factor of 0.303 tCO₂eq/MWh and GEF causality factor of 60% (refer to Annex E for estimation of GHG emissions reductions).

II. STRATEGY

Project Rationale and GEF Policy Conformity

The objective of the proposed project is to reduce GHG emissions and energy consumption in the Armenian buildings sector. The project will create an enabling regulatory environment that addresses building codes, building and materials certification and testing. At the same time, project activities will develop skills and capacity among industry professionals, introducing the principles of integrated building design in Armenian construction practices from the stage of building design through construction, QA/QC and maintenance.

The project focuses on the residential sector for several reasons:

- Residential sector accounts for some 80% of the total building stock,
- Emissions are increasing rapidly in this sector,
- The housing sector in Armenia is a key link between climate change mitigation and national development priorities,
- Increased rates of housing construction are expected to continue throughout the project period, and the government has committed to investing in this sector, which could allow for relatively rapid replication of more efficient designs,
- The World Bank “Armenia Energy Efficiency” project to be implemented during 2010-2014 will target the energy conservation measures in existing public buildings (health and education entities, government administration buildings and other cultural and social institutions),
- Reduction of energy demand in the residential sector will have evident social impacts considering growing prices for natural gas.

However, it is important to note that key project results, such as strengthened codes, energy performance labelling/certification for buildings and construction materials, training in integrated building design, will benefit non residential buildings.

Finally, it should be noted that measures in the project are expected to apply to new buildings and buildings undergoing major reconstruction, as both types of buildings are subject to compliance with the most recent version of building codes. Reconstruction in residential sector is not explicitly addressed in the project, as it forms only a small share of permitted buildings and because there is no state-supported program that addresses reconstruction per se. However, the codes, certification, and training components of the project all build capacity that can be applied to buildings to be reconstructed. In the event that new funding mechanisms will be launched by international financial institutions or bilateral assistance programs, the demonstration component of the project can be expanded to include a reconstruction showcase. It is worth to mention that the WB “Armenia Energy Efficiency” project planned for 2010-2015 has component aimed at increasing the energy efficiency through reconstruction of public buildings. In 2010 GTZ has initiated a project addressing strengthening of multi apartment building management. The project has a demo component on renovation and energy conservation measures of one residential building, which actually can be the case for collaboration between the projects.

The Integrated Building Design Approach (IBDA) as it is discussed in the project documentation is understood as follows: building design that integrates climatic conditions, the capture and the conservation of the free solar and internal gains, the efficient and comprehensive reduction of all heat losses through walls and ventilation, the accurate control of all external energy introduced for providing thermal comfort, light, and hot water, and – last but not least – user awareness of a new behaviors regarding energy use and good operations and maintenance practices. The concept of IBDA calls for architects and engineers to work as a team in order to ingrate these conceptual parameters and the needs of the tenants. The ultimate goal of applying IBDA is to achieve high performance and multiple benefits at a lower cost than the total for all the components combined if these were considered separately.

The project is consistent with GEF-4 Strategic objective CC – 1 “To promote energy-efficient technologies and practices in the appliances and buildings,” because it aims to promoting energy-efficient technologies and practices in buildings.

The project will be implemented under the UNDP-led GEF Global Framework for Promoting Low Carbon Buildings with a primarily focus on two thematic approached promoted by the Global Framework: a) Promotion and increased uptake of High Quality Building Codes and Standards; and b) Developing and Promoting Energy Efficient Building Technologies, Building Materials and Construction Practices. The coordination offered by the global program will help Armenia to learn from experiences and best practices from countries with similar EE building projects in the region (Kyrgyzstan, Uzbekistan and Turkey) and good practice building codes and standards work done in other CIS countries.

Project Objective, Outcomes, Outputs, and Activities

Outcome 1: Design and enforcement of new EE Building Codes and Standards

Under this Component, new building codes will be designed emphasizing energy performance requirements for all types of buildings, and code enforcement mechanisms will be strengthened.

Output 1.1: New mandatory EE building code designed and introduced

Activity 1.1.1. Establish a national commission/expert group of local experts to define the content of a new EE building code, implementation rules, and oversight and supervision.

Activity 1.1.2. Prepare new building codes, calculation methodologies, and implementation procedures for the Ministry of Urban Development, including a timetable for phasing in code requirements, the stages of the building life cycle that will be covered, and a proposed scope for the code (new buildings and buildings undergoing capital reconstruction). Explore the feasibility of moving towards an integrated code that would eventually include lighting and heating systems

Comment: Existing building codes in Armenia do not contain provisions or standards for building energy performance. Armenia has voted for Intergovernmental constriction norm MSN 2.04-02-2004 “Thermal Insulation of the Buildings,” developed by Intergovernmental Normative-Technical Commission on Standards and Certification in Building Sector of CIS, however it has not been adopted and applied in Armenia. The initial focus of the revised codes will be on the building envelope. Regional experience in the introduction of efficient building codes that require a performance target expressed in kWh/m² per year, varying by climate conditions and including space heating, is the most feasible approach. Submission of the revised codes will be carried out using the current system whereby the list of codes to be revised is presented every year by the Ministry of Urban Development to the Government for adoption.

Output 1.2: Standards and calculation methodology to assess energy performance in buildings

Activity 1.2.1. Define new normative energy consumption (maximum normative energy demand for new and reconstructed buildings) in support of the new codes. Definitions will include the existing thermal performance of buildings and a methodology for calculating the following aspects of energy usage:

- Building needs: gross heat losses from envelope and ventilation;
- Energy consumption at building level: needs plus indoor heating and regulation efficiency; and
- Raw energy consumption: the fuel (natural gas) that is consumed by boilers.

Activity 1.2.2 Research and propose technical solutions needed to comply with the new thermal performance requirements of buildings defined: insulation type and thickness for walls, basement and roof, type of windows, building location and orientation, building shape coefficient, window size

and orientation, and heating system (for each item, points will be attributed, then totalized to reach the minimum required quotation to comply with the new norms).

Activity 1.2.3. Provide supporting information and recommendations on the characteristics of insulating and construction materials, their certification, and energy-saving construction technologies for existing and new buildings.

Comment: According to the MSN 2.04-2004, which Armenia has endorsed, it is necessary at the building design stage to define the rate of energy efficiency as either A, B or C. The assessment of energy efficiency is based on the specified costs of the thermal energy necessary to maintain a certain indoor air temperature taking into account the climatic conditions where the building is located. These parameters for residential and public buildings are specified by the national standard GOST 30494. The quality control and conformity of the thermal performance of buildings and its distinct elements with interstate norms are done by accredited laboratories.

Output 1.3: Institutional structures, staffing, capacities and accountability for agencies in charge of code enforcement

Activity 1.3.1: Work with the Ministry of Urban Development to clarify and standardize institutional roles and responsibilities with respect to enforcement of new building energy efficiency codes during design, construction and commissioning stages.

Activity 1.3.2: Strengthen regulatory agencies overseeing technical certification and quality control in the construction sector (the Ministry of Urban Development, the National Institute for Standardization, and other licensed entities) and train staff to ensure compliance with the new building code throughout the design, construction and maintenance stages, including through capacity building in energy audits.

Activity 1.3.3: Design and introduce an energy performance certification scheme (Energy Passport) to support compliance checks of new and reconstructed buildings under the new code, including standardized procedures and methodologies for checking compliance with new codes (through an energy audit) and the issuance of the Energy Passport. The procedure, as well as the energy passport proposed format, will be tested during the commissioning of demo project, and the final scheme will be rolled out on a national scale by the end of the project.

Activity 1.3.4: Test and verify a national standard for energy audits that can be used by all verification bodies in Armenia.

Activity 1.3.5: In coordination with the WB-GEF project on public building renovations, provide relevant inputs into the development of recommendations for integration of provisions and requirements for EE in standard tendering procedures of state-funded construction and procurement programs, focusing on the residential sector (to complement WB-GEF efforts), including exploring feasibility and options for mandating use of IBDA for public sector construction..

Activity 1.3.6: Introduce a system of systematic collection and analysis of information on energy saving measures and their costs and benefits to ensure proper oversight of new building sector regulations.

Comment: The Ministry of Urban Development is the main governmental body responsible for development and implementation of national policies, norms and standards in construction sector, and exercises control for implementation of all state-funded construction and renovation programs and their compliance with established norms and standards. The training and assistance will be provided to increase the knowledge in the field of energy efficiency, design and enforcement of new regulation, principles and benefits of integrated building design.

Implementation of the new code section mandating energy “passports” and energy audits for new buildings, including residential buildings, will be phased over several years with different strategies

and priorities. However, new residential buildings are considered a high-priority sector for initiation of Energy Passports. In Armenia, the Energy Passport will be a quality-control certification required within the building code (SNiPs). The demonstration building under Component 4 will also serve as a showcase for energy passports and will be able to generate required expertise and background for an energy passport program supported by accurate and reliable baseline data on buildings, including the sector’s infrastructure characteristics.

Outcome 2: Quality control, testing and certification of EE materials and equipment

The reliability of building energy performance is closely linked to the quality of the materials and equipment that are used. Therefore, this Component will focus on establishing quality assurance/quality control (QA/QC) standards and will support the certification of key building materials for energy performance.

Output 2.1: Standards for internal QA/QC developed and piloted

Activity 2.1.1: Establish a mandatory assessment system for the conformity of construction materials (including insulation, windows, doors and equipment) with building energy performance according to national standards.

Activity 2.1.2: Develop a procedure for establishing energy characteristics and the requirements for heat transfer in buildings determined and corresponding technical regulation. This technical regulation can be based on 89/106 EU directive requirements; necessary amendments made in the Republic of Armenia Laws “On Standardization” and “On Conformity Assessment.”

Activity 2.1.3: Introduce a voluntary certification and labeling scheme for construction materials (including insulation, windows, doors, equipment) and their energy performance in buildings to provide incentives for high-performing (above-standard) materials.

Activity 2.1.4: Develop national norms for quality control/quality assurance procedures (QA/QC) inside manufacturing facilities and assistance for the suppliers of selected products to set up QA/QC and comply with energy efficiency-related national standards (heat conductivity, heat absorption, dampness, water vapor permeability, water absorption, frost resistance).

Comment: Because integrated building design cannot happen without the appropriate materials and equipment, the project will support the identification of the EE ensuring materials and introduce a certification scheme for them (see the following table).

Table 5: Construction materials and corresponding measures

Insulating materials	<ul style="list-style-type: none"> ▪ Survey of available insulating materials, existing capacities and potential for local manufacturing ▪ Select the products adapted to the country ▪ Develop a labeling scheme for them
Windows	<ul style="list-style-type: none"> ▪ Define the needs and make a survey on the current production and the potential capacity to produce new type of EE windows, ▪ Develop lab test and certification
Heating equipment	<ul style="list-style-type: none"> ▪ Survey of local boiler manufacturers ▪ Appraisal of the quality and efficiency of boilers ▪ Recommendations on proper selection of boilers by size, quality, efficiency ▪ Same approach for regulatory equipment thermostatic and balancing valves, radiators

Output 2.2: Testing laboratory for EE products and certification operating

Activity 2.2.1: Assess the capacities of local accredited testing laboratories and select the most advanced ones as project partners.

Activity 2.2.2: Provide technical assistance (including staff trainings, expert support, and the procurement of essential equipment) for partner testing laboratories and certification bodies accredited in the field of testing and certification of building materials, components, building envelopes and insulation materials.

Comment: The assortment of construction materials available on the Armenian market are divided into three main groups: domestically produced from local resources, domestically produced from imported resources, and imported. While traditional wall materials made of locally-produced stones/blocks made from light concrete predominate, domestic production of the “new generation” of insulating materials is gradually increasing. These new materials consist primarily of blown perlite, stone wool, polymeric heat insulators (plastic foam, thermoplex) and blown tuff and clay mixture. (“Jermakar”).

Output 2.2. will address an important need, as there is currently no system of testing or certifying the energy performance of locally-produced windows and doors, which have a significant share in new construction. Research conducted during the project preparation period ascertained that the certification provided with many imported materials was not of an acceptable standard. The basic testing and certification of the insulation, doors, and windows to be developed in this project component will provide useful information to the pilot building in Component 4, but it will also significantly increase the information that designers and builders have about the materials available on the Armenian market.

Outcome 3: Outreach, training and education

This Component provides training to two distinct groups: (1) architects and engineers (both mid-career professionals and students), who need training in the integrated building design approach; and (2) real estate professionals, who need training in understanding energy performance and its impact on the value of a building, particularly in terms of lower lifetime operating costs and increased comfort.

Output 3.1: Modules on EE buildings introduced to universities

Activity 3.1.1: Compile and customize a handbook on passive design and the integrated building design approaches for Armenian conditions, providing information on the concept, physical principles, technologies, ready-to-use technical solutions, and specific examples of passive integrated design.

Activity 3.1.2: Provide recommendations to post-secondary educational institutions for strengthening the curriculum offerings for future architects and engineers in IBDA and other aspects of energy efficiency in the buildings sector.

Output 3.2: Training courses for architects and engineers on new codes and calculation methodologies

Activity 3.2.1: Develop training curriculum developed for architectural and engineering students and for mid-career professionals on IBDA and compliance with new, more-efficient building codes.

Activity 3.2.2: Procure and adapt software to calculate the heat index, including passive integrated design, and optional technical solutions for buildings that can be used in practice by design institutes, architects and engineers. The software will be owned by the project until its conclusion, at which point it will be provided to either the Architectural University or auditing/testing entity.

Activity 3.2.3: Deliver training to key experts (senior staff at design institutes and senior faculty in academic institutions) on IBDA concepts and practices and compliance with new, more-efficient building codes.

Activity 3.2.4: Support additional training sessions using key experts trained under Activity 3.2.3.

Comment: Training sessions will include, in particular, the following courses: thermal behavior of buildings and materials characteristics; materials uses, technologies, passive solar design; thermal simulation of buildings; design of buildings, and EE renovation of existing buildings: materials, technologies, technical solutions; the energy audit model developed and adapted to the country, climate and local skills and materials; energy audits on actual buildings, and the design of actual buildings (in conjunction with Component 4).

Output 3.3: Outreach and awareness-raising campaign targeting investors and tenants implemented.

Activity 3.3.1: Design and launch an advertising campaign building on the results of the demonstration building to increase the awareness of tenants, investors and the public at large on economic and environmental benefits of integrated building design, EE materials, and products. Campaign materials will specifically target new and planned residential buildings.

Activity 3.3.2: Train real estate brokers and developers on building energy performance indicators (energy audit, energy passport and label) to be used in their marketing strategies. This activity will be closely tied to the roll-out of the energy passport under Component 1.

Comment: Because the majority of residential construction in Armenia is driven by the private sector, this output will target sellers, brokers, and buyers in this sector. Currently, awareness of energy efficiency is very low, and potential buyers do not know that a more efficient building can reduce operating costs over their apartment's lifetime.

Outcome 4: Demonstrating integrated building design

In this Component, the energy and cost-saving potential of the integrated building design approach (IBDA) will be demonstrated in a new, multi-apartment residential building to be built in the 1st Zone, the coldest of Armenia's climatic zones.

Output 4.1: At least one building designed and constructed using an integrated building design approach

Activity 4.1.1.: Propose energy-efficient design, estimate energy performance, and develop construction documents.

Activity 4.1.2: Obtain necessary permits for construction and construct the building.

Activity 4.1.3: Collect all necessary documentation on the design and construction process and make recommendations to Ministry of Urban Development for implementing successful measures from the project across state-funded construction programs.

Comment: The demonstration building selected is a new 4-story residential building located in the "Mush-2" district of the city of Gyumri (4400 degree days). Incremental costs will be co-financed (up to 10% of total costs) for energy efficient design and technology options in the demo building.

Output 4.2: Energy saving and GHG reductions in pilot building monitored and reported

Activity 4.2.1: Test and certify doors, windows, and insulating materials used in construction.

Activity 4.2.2: Conduct energy audit according to the methodology approved in Component 1.

Activity 4.2.3: Provide energy passport for the building according to the methodology approved in Component 1.

Activity 4.2.4: Conduct energy audits for two “control” buildings in Gyumri to serve as the basis for estimates of energy savings: (1) a building employing a similar basic design without EE features; and (2) a building of similar size that was constructed in the early 1990s.

Activity 4.2.5: Monitor energy performance and indoor comfort on an ongoing basis in the pilot building and the two control buildings; energy and financial savings and GHG emission reductions quantified for the pilot building. Unmet need factored into estimates of energy consumption.⁸

Country Ownership: Country Eligibility and Country Drivenness

Armenia ratified the UNFCCC on May 14, 1993 and is therefore eligible for funding from the GEF. The project was endorsed by the GEF Operational Focal Point for Armenia, Aram Harutunyan, on 21 April 2009.

The project is fully in line with the strategic priority of the Armenian Government to increase the efficiency of fossil fuel use and thus ensure long-term economic and environmental stability of the country. In particular, the project will support practical implementation of the Law on “Energy Saving and Renewable Energy” (adopted on November 9, 2004) which calls for promotion of energy efficiency in building and constructions via development and implementation of energy examination/audit system for the existing and planned buildings and constructions. The project will also contribute to the implementation of a number of measures stated in “Energy Sector Development Strategies in the Context of Economic Development of Armenia” (adopted on June 23, 2005) and the “National Program on Energy Saving and Renewable Energy of Republic of Armenia” (adopted on January 18, 2007).

Sustainability

The focus on capacity building in the project will ensure the sustainability of project results in the following ways:

- Strengthening the capacity of the Ministry of Urban Development to enact more efficient building codes will allow ministry experts to make periodic, scheduled improvements in building codes.
- Strengthening the capacity of the Ministry of Urban Development to enforce the codes will provide the ministry with a strategic means for keeping actual building performance higher than it would be without a coordinated and effective enforcement system.
- Strengthening the capacity of architects and engineers to design more efficient buildings will result in cost-effective techniques that these professionals will continue to use in their businesses.
- Raising awareness of developers, real estate professionals, and homebuyers regarding the economic benefits of more-efficient housing will result in higher demand for more efficient apartments even after the awareness-raising activities have concluded.

Replicability

⁸ It is important to note that energy savings may be influenced by unmet need, or “suppressed demand,” which reflects the practice of under-heating buildings (i.e., maintaining an average indoor air temperature that is lower than that stated in the building codes) due to the cost of natural gas. Project monitoring and evaluation will take this factor into account when estimating GHG emission offsets.

By using locally-available materials and straightforward design techniques that are also affordable and do not add substantially to the cost of the building, the demonstration is expected to be replicated because of *market pull*. There are both demand-side and supply-side components of the strategy.

On the supply side: (1) Practicing architects, who design both public and private buildings, and architecture and engineering students, will be trained in IBDA techniques; and (2) Materials certification will make the energy performance of construction materials more transparent and make it easier for architects and engineers to select materials on the basis of energy performance.

On the demand side: (1) Close cooperation with Ministry of Urban Development, one of the implementing agencies, which is overseeing government-funded construction in the residential sector, will increase the uptake of the techniques that are piloted in the demonstration building in other state-funded construction; (2) An awareness-raising campaign – both through energy passports and through outreach to real estate professionals and the public -- will increase the demand for buildings with lower operating costs; and (3) Stricter codes and improved enforcement will create a very strong incentive to design more efficient buildings; in fact, more efficient buildings will effectively be mandated by regulatory improvements.

III. RESULTS AND RESOURCES FRAMEWORK

Intended Outcome as stated in the Country Programme Results and Resource Framework:						
Output 4.1.5: Innovative policies / practices for environmentally sound, energy efficient technologies and clean production developed and implemented.						
Outcome indicator(s) as stated in the Country Programme Results and Resources Framework, including baseline and targets:						
Indicator: 1. No. of laws and legal acts promoting energy efficiency adopted. 2. No. of initiatives promoting energy efficiency developed and implemented.						
Baseline: Around 28% of GDP growth was ensured through construction activities; however, no EE standards were followed. Innovative EE practices have limited implications in Armenia.						
Target: Legal acts on promotion of energy efficiency in buildings developed and updated by the end of 2015. At least 1 building piloted under new energy efficiency approach by the end of 2015.						
Programme Component (Strategic Plan 08-11): Environment and sustainable development						
Partnership Strategy: Ministry of Nature Protection, Ministry of Urban Development						
Project title, Atlas Award ID and Atlas Project ID: Improving Energy Efficiency in Buildings in Armenia						
INTENDED OUTPUT(S)	OUTPUT BASELINE(S)	OUTPUT INDICATOR(S)	OUTPUT TARGETS	INDICATIVE ACTIVITIES	RESPONSIBLE PARTIES	INPUTS
Global Development Objective: Reduce GHG emissions and energy consumption in the Armenian residential building sector	Average thermal energy consumption for space heating in new residential buildings in Armenia	160 kWh/m ² year	96 kWh/m ² year			
	Zero reductions below business as usual (BAU) scenario.	Cumulative CO ₂ emission reductions from new residential buildings to be built during project lifetime (2010-2015) against the baseline	Approx. 60 ktCO ₂ eq reduced compared to the BAU scenario			
Output 1.1: New mandatory EE building code	Codes for residential buildings are limited in energy performance to minimal hygienic norms.	Existence and substance of legally binding codes that mandate an improved level of energy performance in four climate zones of Armenia	By end of project, new codes adopted, setting mandatory energy performance targets comparable with MSN/EU standards	1.1.1, 1.1.2	Project Management Team (PMT) MUD	GEF: \$137,000 GoA: \$70,000 (in-kind)
Output 1.2	Lack of methodology	Standards and	By the project midterm, audit protocols	1.2.1, 1.2.2,		

Standards and calculation methodology to assess energy performance in buildings	for assessing energy performance in buildings; lack of protocol for energy audits and performance certification and labeling	methodology for assessing energy performance in buildings	are in place By the project mid-term, guidelines for energy passport are drafted and approved By the end of the project, audits are carried out in at least 50% of new buildings and buildings undergoing capital reconstruction By the end of the project, energy passports provided for at least 50% of new buildings and buildings undergoing capital reconstruction.	1.2.3		
Output 1.3 Institutional structures, staffing, capacities and accountability for agencies in charge of code enforcement	Statistics on enforcement do not exist EE requirements not included	Capacity of the MUD inspectorate and independent technical supervision bodies to implement and check compliance with energy efficiency codes Integration of EE requirements into state-funded construction and procurement activities	By project mid-term, code enforcement program in place. By end of project, revision process for codes carried out or underway. By end of project, code enforcement program reaches 50% of new and reconstructed buildings. By end of project, EE requirements factored into all state-funded construction and procurement activities	1.3.1., 1.3.2., 1.3.3, 1.3.4, 1.3.5, 1.3.6		
Output 2.1: Standards for internal QA/QC developed and piloted	Due to the negligible demand for the corresponding services, the laboratories have no incentives to obtain the modern equipment, thus no testing and certification of EE materials is done in country.	Demand for local testing laboratory(ies) testing/certification services	By end of project, at least one laboratory can perform testing and certification of domestic and imported construction materials such as insulation, windows, doors, and heating systems	2.1.1., 2.1.2., 2.1.3, 2.1.4.	PMT Partner laboratory/(ies)	GEF \$140,000 GoA \$50,000 (in-kind)

Output 2.2: Testing laboratory for EE products and certification	5-10%	Increase in share of domestically produced EE materials in the construction market	By end of project, domestically-produced EE materials comprise at least 10-20% of the market.	2.2.1, 2.2.2.		
Output 3.1: Modules on EE buildings introduced to universities	IBDA concepts are not used in the country at present	Use of Integrated Building Design Approach (IBDA) concepts in new building constructions	By end of project, all graduating architecture and civil engineering students with an emphasis on residential buildings are aware of IBDA concepts.	3.1.1., 3.1.2.	PMT MNP MUD	GEF \$120,000 UNDP \$63,000
Output 3.2: Training courses for architects and engineers on new codes and calculation methodologies	IBDA concepts are not used in the country at present	Use of Integrated Building Design Approach (IBDA) concepts in new building constructions	By project mid-term, key experts at design institutes and in academia are using IBDA concepts. By end of project, at least 4-5 % of buildings constructed annually apply IBDA	3.2.1, 3.2.2., 3.2.3, 3.2.4	Yerevan State University of Architecture and Construction	GoA \$17,000 (in-kind)
Output 3.3: Outreach and awareness-raising campaign targeting investors and tenants implemented	Energy passports and labels are not used	Rate of application of the energy passport and label system by real estate developers	By project mid-term, a majority of real estate professionals are aware of the potential benefits of energy-efficient buildings and understand the energy passport and label. By end of project, at least 10% of new residential building stock is marketed with energy passports and labels	3.3.1, 3.3.2		
Output 4.1: At least one building designed and constructed using an integrated building design approach	The standard building design used in housing developments may not comply with current building codes regarding thermal performance	Thermal performance of the demonstration building	By project mid-term, the building design is completed and approved by the developer and MUD.	4.1.1., 4.1.2., 4.1.3	PMT MUD	GEF \$600,000 GoA \$2,000,000
Output 4.2: Energy saving and GHG reductions in pilot building monitored and reported			By end of project, demonstration building showing at least 30% better thermal performance than the improved code and 60% better than the existing code	4.2.1, 4.2.2, 4.2.3, 4.2.4, 4.2.5		

IV. MANAGEMENT ARRANGEMENTS

The project will be implemented by the Ministry of Nature Protection (MNP) following UNDP National Implementation modality. Being the national authorized body for the UNFCCC implementation in Armenia, MNP has coordinated the climate change program of UNDP-GEF since 1997 and will be responsible for the overall management and supervision of the project to ensure synergy with other GHG mitigation policies and measures in country. MNP has capacity and knowledge to guide and oversee the conceptual part of the project implementation including professional guidance for achieving the climate change mitigation objectives and overseeing the GHG emissions reduction impacts. MNP has been the implementing agency for the full size GEF-UNDP project district heating project and has a proven track record in successful implementation and cooperation with different ministries and stakeholders. The Ministry of Urban Development (MUD) is the lead government agency in the area of urban construction policy and public buildings construction: its departments oversee areas such as building norms, design regulations and innovation, certification of building materials, tendering, and monitoring. The Energy Efficient Building Code development will be conducted by the ad hoc working group established under the MUD which will be responsible for the overall coordination with other stakeholders. MUD will allocate dedicated technical staff to support project implementation on a part-time basis. It will also assign a Project Focal Point to provide for overall project guidance and coordination with the ongoing work in the sector. Several divisions within MUD will be particularly important for project implementation, such as those focusing on oversight of design organizations, implementation of Housing Program, the implementation of new technologies, and urban planning.

The day-to-day implementation of the project will be carried out through the well-established UNDP Climate Change Program Unit coordinated by the MNP (office space, means of communication, and other utilities as part of the government in-kind contribution): see Fig. 5.

The primary stakeholders in this project will be invited to participate in the Project Steering Committee (PSC) are Ministry of Urban Development and Ministry of Nature Protection, Ministry of Economy, Ministry of Energy and Natural Resources, Armenia Renewable Resources and Energy Efficiency Fund, Institute of Energy, Yerevan State University of Architecture and Construction, design and construction organizations/associations, and other organizations working on energy efficiency.

The PSC will also organize meetings to monitor implementation of the project activities during the project management boundaries (planned timeframes), and/or the meetings can be set up based on the Programme Coordinator request. The PSC provides guidance to the TL to make decisions that are out of the TL tolerance limits (mainly related to the project timeframes and budget issues). Based on the approved AWP, the PSC will consider and approve the quarterly plans (if applicable) and also approve any essential deviations from the original plans.

The PSC consists of two major project stakeholders:

- (i) Senior Suppliers are UNDP and GEF, which are responsible for timely provision of all resources required for achieving the project outputs. These resources include the following: program and technical support, knowledge and information, planning and evaluation, financial resources, logistics and other assistance;
- (ii) The Executive Agencies (Ministry of Nature Protection and Ministry of Urban Development) are Implementing Partners in Armenia. The Executive Agency is an organization that is fully interested in successful achieving the project outputs.

Other stakeholders, including project beneficiaries, are listed in Figure 4.

UNDP will be the GEF Implementing Agency and its Country Office will provide project support. UNDP Armenia will monitor progress towards intended results through regular contacts with the Project Implementation Team and monitoring visits, on implementation matters and problem solving. UNDP will also provide administrative support upon request and ensure financial oversight. The project will be implemented following the standard UNDP National Implementation rules and procedures.

A full time technical expert (Task Leader – TL) will be brought in under the project to provide necessary management and technical backstopping to the Climate Change Program Coordinator. The Task Leader is fully responsible for the direct project execution and coordination of all project activities. He/she has a right to implement the planned activities in accordance with the AWP approved by the PSC. A project team will be established and recruited on a competitive basis for project implementation. The project team will be managed by the TL, who will be accountable to the Programme Coordinator and UNDP for planning, implementation quality, timeliness and effectiveness of the activities carried out and the proper use of funds. The recruitment of TL will be carried out jointly by the National Executing Agency and UNDP according to the UNDP procedures. 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 (PPG). Such approach will ensure smooth start up and implementation of the project. The Task Leader will be supported by the International Consultants as well as by local support staff 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. The services of an international consultant will be engaged during the project inception phase. Additional short-term national and international experts will be brought in for different technical aspects as needed. The Project Management Team will be responsible inter alia for: Recruitment of International and National Consultants, including candidate search/selection, preparation of TORs, supervision; Project coordination, including organization of regular meetings with project implementing agency, financial management and accountability, issuance of payments, training staff on financial disbursements and reporting, ensuring completeness and timeliness of financial reporting; Technical reporting including preparation of progress reports; Monitoring and evaluation; organization of training/workshop activities.

A function to be performed by the Project Support means provision of services required for the project implementation or services required by the TL. Services include project reporting, filing of project information, logistics, and other support on financial matters, procurement or hiring procedures.

To achieve the project outputs and implement the project activities, TL will work under direct coordination of UNDP climate change related programme coordinator and will be supported by a team of national experts (from research institutes, relevant ministries, NGOs etc.) and international consultant(s) recruited by UNDP based on the approved Annual Work plan. The TL will be responsible for the consultants' timely deliverables and their contributions to the overall project outputs.

Direct UNDP Country office Support Services to the Programme Implementation

The UNDP and National Executing Partners (MNP and MUD) have agreed that the UNDP Country Office will provide the following support services for the project activities:

- (i) Identification and/or recruitment and solution of administrative issues related to the project personnel;
- (ii) Procurement of commodities, labor and services;
- (iii) Identification and facilitation of training activities, seminars and workshops;
- (iv) Financial monitoring and reporting;
- (v) Processing of direct payments;
- (vi) Supervision of project implementation, monitoring and assistance in project assessment.

The procurement of goods and services and the recruitment of project personnel by the UNDP country office shall be in accordance with the UNDP regulations, rules, policies and procedures. If the requirements for support services by the country office change during the life of a project, the list UNDP country office support services is revised with the mutual agreement of the UNDP Resident Representative and the Implementing Partner in Armenia.

The relevant provisions of the Standard Basic Assistance Agreement (SBAA) between the Government of Armenia and the UNDP, and the United Nations Development Programme (UNDP), signed by the parties on 8 March, 1995, including the provisions on liability and privileges and immunities, shall apply to the provision of such support services.

Any claim or dispute arising under or in connection with the provision of support services by the UNDP country office in accordance with this document shall be handled pursuant to the relevant provisions of the SBAA.

In order to accord proper acknowledgement of GEF funding, a GEF logo should appear on all relevant GEF project publications, including among others, project hardware and vehicles purchased with GEF funds. Any citation on publications regarding projects funded by GEF should also accord proper acknowledgment to GEF. The logos of the UNDP, GEF and Government should be equal and appear on all communication and other public materials.

FIGURE 4: STAKEHOLDER INVOLVEMENT IN PROJECT IMPLEMENTATION

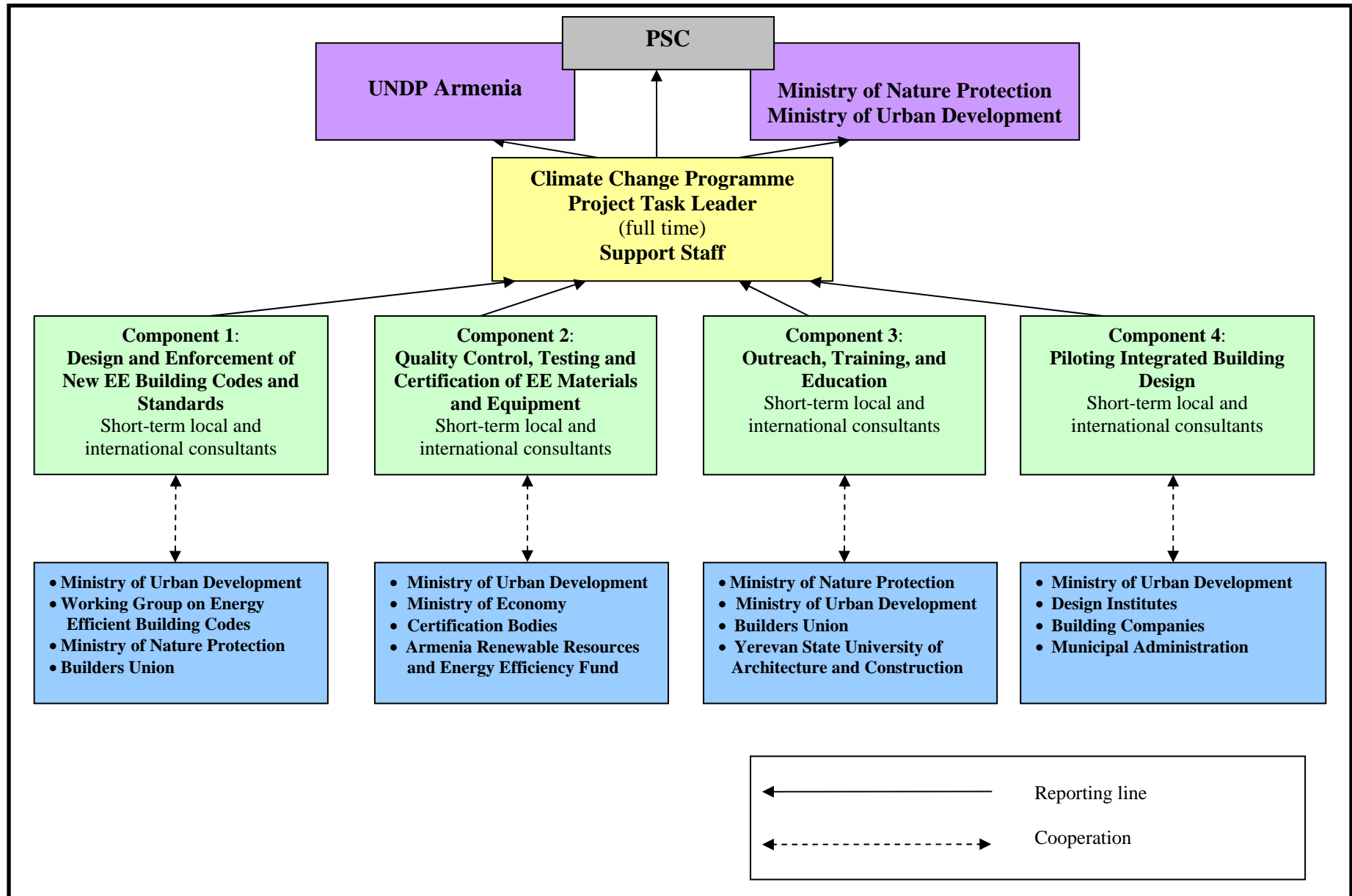
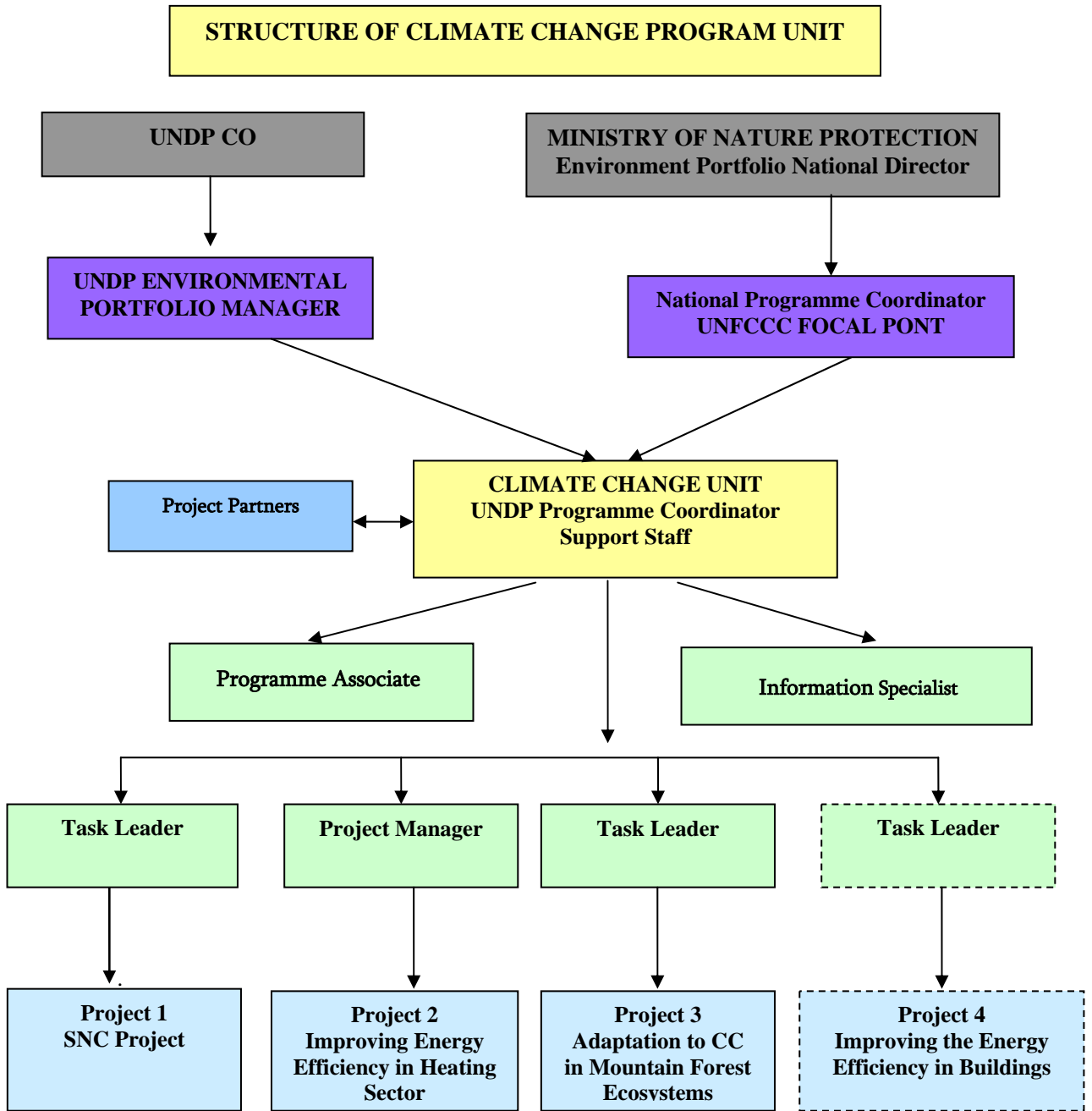


FIG 5: UNDP-GEF ARMENIA PROJECTS MANAGEMENT ARRANGEMENTS



V. MONITORING AND EVALUATION PLAN AND BUDGET

In accordance with the programming policies and procedures outlined in the UNDP User Guide, the project will be monitored through the following:

Within the annual cycle

- (i) On a quarterly basis, a quality assessment shall record progress towards the completion of key results, based on quality criteria and methods captured in the Quality Management table below.
- (ii) An Issue Log shall be activated in Atlas and updated by the TL to facilitate tracking and resolution of potential problems or requests for change.
- (iii) Based on the initial risk analysis submitted, a risk log shall be activated in Atlas and regularly updated by reviewing the external environment that may affect the project implementation.
- (iv) Based on the above information recorded in Atlas, a Quarterly Progress Reports (QPR) shall be submitted by the TL to the PSC through Project Assurance, using the standard report format available in the Executive Snapshot.
- (v) a project Lesson-learned log shall be activated and regularly updated to ensure on-going learning and adaptation within the organization, and to facilitate the preparation of the Lessons-learned Report at the end of the project
- (vi) a Monitoring Schedule Plan shall be activated in Atlas and updated to track key management actions/events

Annually

- (i) Annual Review Report. An Annual Review Report shall be prepared by the TL and shared with the PSC and the Outcome Board. As minimum requirement, the Annual Review Report shall consist of the Atlas standard format for the QPR covering the whole year with updated information for each above element of the QPR as well as a summary of results achieved against pre-defined annual targets at the output level.
- (ii) Annual Project Review. Based on the above report, an annual project review shall be conducted during the fourth quarter of the year or soon after, to assess the performance of the project and appraise the Annual Work Plan (AWP) for the following year. In the last year, this review will be a final assessment. This review is driven by the PSC and may involve other stakeholders as required. It shall focus on the extent to which progress is being made towards outputs, and that these remain aligned to appropriate outcomes.

Project Inception Phase

Monitoring and Evaluation (M&E) of the project will follow the UNDP Program Manual and GEF M&E procedures and will be conducted by the project team and the UNDP Country Office (UNDP-CO) with support from UNDP-GEF Regional Coordination Unit in Bratislava.

M&E activities are spread across the project components. The overall emphasis on M&E in the context of the project is to capture valuable data on both new and reconstructed public buildings in Armenia and to understand the impacts of both the buildings and the policies and programmes that relate to them. Special attention will be given to the development of a methodology that will meet these needs and will conform to internationally-recognized best practices in GHG monitoring methodologies and protocols.

The M&E plan includes the following documents and activities: inception report, project implementation reviews, quarterly operational reports, a mid-term and final evaluation. The M&E budget is provided in the table below. An M&E plan will be finalized at the Project Inception Meeting following a collective fine-tuning of indicators, means of verification, and the full definition of project staff M&E responsibilities.

A Project Inception Workshop will be conducted with the full project team, relevant government counterparts, co-financing partners, the UNDP-CO and representation from the UNDP-GEF Regional Coordinating Unit. A fundamental objective of this Inception Workshop will be to assist the project team to understand and take ownership of the project's goal, objective and outcomes, as well as finalize preparation of the project's first annual work plan on the basis of the project's log frame matrix. This will include reviewing the logframe (indicators, means of verification, assumptions), imparting additional detail as needed, and on the basis of this exercise finalize the Annual Work Plan (AWP) with precise and measurable performance indicators, and in a manner consistent with the expected outcomes for the project. Additionally the purpose and objective of the Inception Workshop (IW) will be to: (i) introduce project staff with the UNDP-GEF expanded team which will support the project during its implementation, namely the CO and responsible Regional Coordinating Unit staff; (ii) detail the roles, support services and complementary responsibilities of UNDP-CO and RCU staff vis à vis the project team; (iii) provide a detailed overview of UNDP-GEF reporting and monitoring and evaluation (M&E) requirements, with particular emphasis on the harmonized Annual Project Implementation Reviews (PIRs)/Annual Project Report (APR), PSC meetings, as well as mid-term and final evaluations. Equally, the IW will provide an opportunity to inform the project team on UNDP project related budgetary planning, budget reviews, and mandatory budget review. The IW will also provide an opportunity for all parties to understand their roles, functions, and responsibilities within the project's decision-making structures, including reporting and communication lines, and conflict resolution mechanisms. The Terms of Reference for project staff and decision-making structures will be discussed again, as needed, in order to clarify for all, each party's responsibilities during the project's implementation phase.

Monitoring responsibilities and events

The day-to-day monitoring of implementation progress will be the responsibility of the TL, whose work will be based on the project's annual work plan and its indicators. Annual monitoring will be carried out by the PSC, including Government, UNDP, and key beneficiaries of the project, which is the highest policy-level meeting of the parties directly involved in the implementation of a project. The first such meeting will be held within the first twelve months following the inception workshop. A detailed schedule of PSC meetings to review project progress will be developed by the project management, in consultation with project national implementing agencies, Ministry of Nature Protection and Ministry of Urban Development, and stakeholder representatives and incorporated in the Project Inception Report. Such a schedule will include: (i) tentative time frames for PSC meetings and (ii) project related Monitoring and Evaluation activities. For each PSC meeting the TL will prepare annual project report and submit it to the PB members at least two weeks prior to the meeting for review and comments. In addition, ad-hoc meetings can be scheduled between the Government, UNDP, TL, and other pertinent stakeholders as deemed appropriate and relevant to allow parties to take stock and to troubleshoot any problems pertaining to the project in a timely fashion to ensure smooth implementation of project activities.

Day to day monitoring of implementation progress will be the responsibility of the TL, assisted by experts as deemed necessary based on the project's Annual Work Plan and its indicators. The Project Team will inform the UNDP-CO of any delays or difficulties faced during implementation so that the appropriate support or corrective measures can be adopted in a timely and remedial fashion. Periodic monitoring of implementation progress will be undertaken by the UNDP-CO through quarterly meetings with the National Executing Agency, or more frequently as deemed necessary. This will allow parties to take stock and to troubleshoot any problems pertaining to the project in a timely fashion to ensure smooth implementation of project activities.

Project Reporting

The Task Leader in conjunction with the UNDP-GEF extended team will be responsible for the preparation and submission of the following reports that form part of the monitoring process:

A Project Inception Report will be prepared immediately following the Inception Workshop. It will include a detailed First Year/Annual Work Plan divided in quarterly time-frames detailing the activities and progress indicators that will guide implementation during the first year of the project. This Work Plan would include the dates of specific field visits, support missions from the UNDP-CO or the Regional Coordinating Unit (RCU) or consultants, as well as time-frames for meetings of the project's decision making structures. The Report will also include the detailed project budget for the first full year of implementation, prepared on the basis of the Annual Work Plan, and including any monitoring and evaluation requirements to effectively measure project performance during the targeted 12 months timeframe.

The Inception Report will include a more detailed narrative on the institutional roles, responsibilities, coordinating actions and feedback mechanisms of project related partners. In addition, a section will be included on progress to date on project establishment and start-up activities and an update of any changed external conditions that may effect project implementation. When finalized the report will be circulated to project counterparts who will be given a period of one calendar month in which to respond with comments or queries. Prior to this circulation of the Report, the UNDP Country Office will review the document. As part of the Inception Report, the project team 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 APRs. These technical reports will represent the project's substantive contribution to specific areas, and will be used in efforts to disseminate relevant information and best practices at local, national and international levels.

The UNDP-GEF PIR/APR will be prepared on an annual basis prior to the PB meeting to reflect progress achieved in meeting the project's Annual Work Plan and assess performance of the project in contributing to intended outcomes through outputs and partnership work. The PIR/APR will include the following: (i) An analysis of project performance over the reporting period, including outputs produced and, where possible, information on the status of the outcome; (ii) The constraints experienced in the progress towards results and the reasons for these; (iii) The three (at most) major constraints to achievement of results; (iv) AWP and other expenditure reports; (v) lessons learned; and (vi) Clear recommendations for future orientation in addressing key problems in lack of progress.

Short reports outlining main updates in project progress will be provided quarterly to the local UNDP Country Office and the UNDP regional office by the project team.

During the last three months of the project the project team will prepare the Project Terminal Report. This comprehensive report will summarize all activities, achievements and outputs of the Project, lessons learnt, objectives met, or not achieved structures and systems implemented, etc. and will be the definitive statement of the Project's activities during its lifetime. It will also lay out recommendations for any further steps that may need to be taken to ensure sustainability and replicability of the project's activities.

Independent evaluations

The project will be subject to two independent external evaluations as follows. An independent Mid-Term Evaluation will be undertaken at the mid point of project implementation (May 2012). The Mid-Term Evaluation will determine progress being made towards the achievement of outcomes and will identify course correction if needed. It will focus on the effectiveness, efficiency and timeliness of project implementation; will highlight issues requiring decisions and actions; and will present initial lessons learned about project design, implementation and management. Findings

of this review will be incorporated as recommendations for enhanced implementation during the final half of the project's term. The organization, terms of reference and timing of the mid-term evaluation will be decided after consultation between the parties to the project document. The Terms of Reference for this Mid-term evaluation will be prepared by the UNDP CO based on guidance from the Regional Coordinating Unit and UNDP-GEF. An independent Final Evaluation will take place three months prior to the terminal tripartite review meeting and will be undertaken in accordance with UNDP and GEF guidance. The final evaluation will focus on the delivery of the project's results as initially planned (and as corrected after the mid-term evaluation, if any such correction took place). The final evaluation will look at impact and sustainability of results, including the contribution to capacity development and the achievement of global environmental goals. The final evaluation should also provide recommendations for follow-up activities, and the report will feature management response to the issues raised. The Terms of Reference for this evaluation will be prepared by the UNDP CO based on guidance from the Regional Coordinating Unit and UNDP-GEF.

Audit clause

The Government of Armenia will provide the Resident Representative of UNDP Armenia with certified periodic financial statements, and with an annual audit of the financial statements relating to the status of UNDP (including GEF) funds according to the established procedures set out in the Programming and Finance manuals. The Audit will be conducted by the legally recognized auditor of the Government, or by a commercial auditor engaged by the Government.

Learning and knowledge sharing

Results from the project will be disseminated within and beyond the project intervention zone through existing information sharing networks and forums.

In addition, the project will cooperate closely with UNDP Climate Change Projects, particularly, with "Armenia: Improving the Energy Efficiency of Municipal Heating and Hot Water Supply" 00035799 UNDP-GEF project, as relevant and appropriate, in **UNDP/GEF sponsored networks organized for Senior Personnel** working on projects that share common characteristics. The project will identify and participate, as relevant and appropriate, in scientific, policy-based and/or any other networks, which may be of benefit to project implementation through lessons learned. The project will identify, analyze, and share lessons learned that might be beneficial in the design and implementation of similar future projects. Identifying and analyzing lessons learned is an on-going process, and the need to communicate such lessons as one of the project's central contributions is a requirement to be delivered at least once every 12 months. UNDP-GEF shall provide a format and assist the project team in categorizing, documenting and reporting on lessons learned.

Finally, there will be a two-way flow of information between the project and the **UNDP-GEF global Framework Programme on Low Greenhouse Gas Emissions Buildings**. Activities that will benefit the project and support effective project learning and knowledge sharing will include those carried out under two of the thematic approaches in the framework programme: 1) Promoting and increasing the uptake of high quality energy building regulations; and 2) Using new Integrated Building Design Approach (IBDA) to promote and test energy efficiency in residential buildings. The project results will be useful to the framework programme in areas where it focuses on the leading role of the public sector, such as codes, metering, assessment and monitoring, and broad education programmes. Data from the project will also enhance the state of knowledge of building performance in the broader region.

Type of M&E activity	Responsible Parties	Budget US\$ Excluding project team Staff time	Time frame
Inception Workshop	<ul style="list-style-type: none"> ▪ Project Coordinator ▪ UNDP Armenia ▪ UNDP GEF 	5,000	Within first two months of project start up
Inception Report	<ul style="list-style-type: none"> ▪ Project Team ▪ UNDP Armenia 	None	Immediately following IW
Development of a Methodology for Measuring Building Performance and Related Emissions Reduction	<ul style="list-style-type: none"> ▪ Oversight by GEF Technical Advisor ▪ Short-term international consultant 	9,000	Immediately following IW
Measurement of Means of Verification for Project Purpose Indicators	<ul style="list-style-type: none"> ▪ Project Coordinator will oversee the hiring of specific studies and institutions, and delegate responsibilities to relevant team members 	<i>To be finalized in Inception Phase and Workshop.</i>	Start, mid and end of project
Measurement of Means of Verification for Project Progress and Performance (measured on an annual basis)	<ul style="list-style-type: none"> ▪ Oversight by Project GEF Technical Advisor and Project Coordinator ▪ Measurements by regional field officers and local IAs 	<i>To be determined as part of the Annual Work Plan's preparation.</i>	Annually prior to APR/PIR and to the definition of annual work plans
APR and PIR	<ul style="list-style-type: none"> ▪ Project Team ▪ UNDP Armenia ▪ UNDP-GEF 	None	Annually
TPR and TPR report	<ul style="list-style-type: none"> ▪ Government Counterparts ▪ UNDP Armenia ▪ Project team ▪ UNDP-GEF Regional Coordinating Unit 	None	Each year, upon receipt of APR
Steering Committee Meetings	<ul style="list-style-type: none"> ▪ Project Coordinator ▪ UNDP Armenia 	None	Following Project IW and subsequently at least once a year
Periodic status reports	<ul style="list-style-type: none"> ▪ Project team 	None	To be determined by Project team and UNDP CO
Technical reports	<ul style="list-style-type: none"> ▪ Project team ▪ Hired consultants as needed 	10,000	To be determined by Project Team and UNDP-CO
Mid-term External Evaluation	<ul style="list-style-type: none"> ▪ Project team ▪ UNDP Armenia ▪ UNDP-GEF Regional Coordinating Unit ▪ External Consultants (i.e. evaluation team) 	12,000	At the mid-point of project implementation.
Final External Evaluation	<ul style="list-style-type: none"> ▪ Project team, ▪ UNDP Armenia ▪ UNDP-GEF Regional Coordinating Unit 	18,,000	At the end of project implementation
Terminal Report	<ul style="list-style-type: none"> ▪ Project team ▪ UNDP Armenia ▪ External Consultant 	None	At least one month before the end of the project

Lessons learned	<ul style="list-style-type: none"> ▪ Project team ▪ UNDP-GEF Regional Coordinating Unit (suggested formats for documenting best practices, etc) 	None	Annually
Audit	<ul style="list-style-type: none"> ▪ UNDP Armenia ▪ Project team 	10,000 (average 2,500 per year)	Annually
Visits to field sites (UNDP staff travel costs to be charged to IA fees)	<ul style="list-style-type: none"> ▪ UNDP Armenia ▪ UNDP-GEF Regional Coordinating Unit (as appropriate) ▪ Government representatives 	13,000	Annually
TOTAL INDICATIVE COST			
<i>Excluding project team staff time and UNDP staff and travel expenses</i>		US\$ 77,000	

Quality Management

Activity 1 Result(s) (Atlas Activity ID)	Short title to be used for Atlas Activity ID EE Codes and Standards	Start Date: 2010 End Date: 2015
Purpose	What is the purpose of the activity? Introduce and enforce more efficient building codes and standards	
Description	Planned actions to produce the activity result. Introduction of mandatory efficient building code, implementation of new standards and calculation methodologies, capacity strengthening in enforcement agency	
Quality Criteria <i>how/with what indicators the quality of the activity result will be measured?</i>	Quality Method <i>Means of verification. what method will be used to determine if quality criteria has been met?</i>	Date of Assessment <i>When will the assessment of quality be performed?</i>
Presence and characteristics of new codes and standards; performance of new buildings	Project documentation, public records of legislation, independent evaluation	Internal Annual Evaluation; Independent Evaluations in September 2012 and March 2015

Activity 2 Result(s) (Atlas Activity ID)	Short title to be used for Atlas Activity ID EE Materials Certification	Start Date: 2010 End Date: 2014
Purpose	What is the purpose of the activity? Improve the quality and availability of domestically-produced EE building materials	
Description	Planned actions to produce the activity result. Develop and pilot QA/QC standards; operate certification laboratory	
Quality Criteria <i>how/with what indicators the quality of the activity result will be measured?</i>	Quality Method <i>Means of verification. what method will be used to determine if quality criteria has been met ?</i>	Date of Assessment <i>When will the assessment of quality be performed?</i>
Presence of functioning laboratory; existence of QA/QC system for materials	Review of project documentation; independent evaluation	Internal Annual Evaluation; Independent Evaluations in September 2012 and March 2014

Activity 3 Result(s) (Atlas Activity ID)	Short title to be used for Atlas Activity ID EE Outreach, Training, and Education	Start Date: 2010 End Date: 2015
Purpose	What is the purpose of the activity? To enable architects and engineers to design efficient buildings that are compliant with a stricter code; to inform real estate professionals and tenants of the benefits of more-efficient buildings.	

Description	<i>Planned actions to produce the activity result.</i> University curriculum on Integrated Building Design Approach; training for architects and engineers in code compliance and IBDA; outreach campaign for real estate sector	
Quality Criteria <i>how/with what indicators the quality of the activity result will be measured?</i>	Quality Method <i>Means of verification. what method will be used to determine if quality criteria has been met ?</i>	Date of Assessment <i>When will the assessment of quality be performed?</i>
Use of skills obtained during training; level of awareness regarding efficient design	Project documentation; interviews/surveys; independent evaluation	Internal Annual Evaluation; Independent Evaluations in September 2012 and March 2014
Activity 4 Result(s) (Atlas Activity ID)	<i>Short title to be used for Atlas Activity ID</i> EE Demo Building	Start Date: 2010 End Date: 2015
Purpose	<i>What is the purpose of the activity?</i> Demonstrate EE design in a state-funded residential building	
Description	<i>Planned actions to produce the activity result.</i> Build an efficient building in the city of Gyumri and monitor and document its performance	
Quality Criteria <i>how/with what indicators the quality of the activity result will be measured?</i>	Quality Method <i>Means of verification. what method will be used to determine if quality criteria has been met?</i>	Date of Assessment <i>When will the assessment of quality be performed?</i>
Energy consumption and associated GHG emissions; fuel expenditures; and indoor air temperature	Review of construction documents; permits; site visits; technical measurements; project documentation ;independent evaluation	Internal Annual Evaluation; Independent Evaluations in September 2012 and March 2015

VI. LEGAL CONTEXT

This Project Document shall be the instrument referred to as such in Article I of the Standard Basic Assistance Agreement (SBAA) between the Government of Armenia and the United Nations Development Programme (UNDP), signed by the parties on 8 March, 1995. 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.

Consistent with the Article III of the Standard Basic Assistance Agreement, the responsibility for the safety and security of the executing agency and its personnel and property, and of UNDP's property in the executing agency's custody, rests with the executing agency.

The executing agency shall:

- (i) put in place an appropriate security plan and maintain the security plan, taking into account the security situation in the country where the project is being carried;
- (ii) assume all risks and liabilities related to the executing agency's security, and the full implementation of the security plan.

UNDP reserves the right to verify whether such a plan is in place, and to suggest modifications to the plan when necessary. Failure to maintain and implement an appropriate security plan as required hereunder shall be deemed a breach of this agreement.

The UNDP Resident Representative 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:

- a) Revision of, or addition to, any of the annexes to the Project Document;
- b) 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;
- c) 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
- d) Inclusion of additional annexes and attachments only as set out here in this Project Document

VII. TOTAL BUDGET AND WORKPLAN

Award ID: 00059937
Award Title: Armenia PIMS 4245 FSP ""Improving Energy Efficiency in Buildings" UNDP/GEF Project"
Business Unit: ARM10
Project Title: Armenia PIMS 4245 FSP ""Improving Energy Efficiency in Buildings" UNDP/GEF Project"
Project ID: 00075196
Implementing Partner (Executing Agency): Ministry of Nature Protection (MNP)

GEF Outcome/Atlas Activity	Responsible Party/Implementing Agent	Fund ID	Donor Name	Atlas Budgetary Account Code	ATLAS Budget Description	Amount Year 2010 (USD)	Amount Year 2011 (USD)	Amount Year 2012 (USD)	Amount Year 2013 (USD)	Amount Year 2014 (USD)	Amount Year 2015 (USD)	Total (USD)	Budget notes
OUTCOME 1: Design and enforcement of new EE Building Codes and Standards	UNDP	62000	GEF	71200	International Consultants	6 000	12 000	3 000	-	-	-	21 000	1
				71300	Local Consultants	4 000	15 000	11 000	6 000	3 000	-	39 000	2
				71600	Travel	3 000	8 000	4 000	1 000	-	-	16 000	3
				72100	Contractual services-companies	9 000	25 000	9 000	-	-	-	43 000	4
				74200	Audio Visual and Printing Production Costs	2 000	4 000	4 000	2 000	2 000	-	14 000	5
				74500	Miscellaneous	1 000	2 000	1 000	-	-	-	4 000	
				Sub-Total: Outcome 1 - GEF		13,500	66,000	32,000	9,000	5,000	-	125,500	
				71200	International Consultants	2,500	-	-	-	-	-	2,500	
				72100	Contractual Services - Companies	9,000	-	-	-	-	-	9,000	
				Sub-Total: Outcome 1 - UNDP		11,500	-	-	-	-	-	11,500	
Total Outcome 1		25,000	66,000	32,000	9,000	5,000	-	137,000					
OUTCOME 2: Quality control, testing and certification of EE materials and equipments	UNDP	62000	GEF	71200	International Consultants	-	15,000	-	-	-	-	15,000	6
				71300	Local Consultants	3,000	12,000	9,000	9,000	5,000	3,000	41,000	7
				71600	Travel	-	4,000	4,000	3,000	-	-	11,000	8
				72100	Contractual services-companies	-	20,000	-	-	-	-	20,000	9
				72200	Equipment	-	40,000	2,000	-	-	-	42,000	10
				72800	Information Technology Equipment	-	3,000	-	-	-	-	3,000	11
				73100	Rental and Maintenance	-	-	1,000	-	-	1,000	2,000	12
				74200	Audio Visual and Printing Production Costs	-	-	2,000	1,000	1,000	2,000	6,000	13
				Total Outcome 2		3,000	94,000	18,000	13,000	6,000	6,000	140,000	

OUTCOME 3: Outreach, training and education on integrated building design	UNDP	62000	GEF	71300	Local Consultants	-	6,000	9,000	9,000	3,000	6,000	33,000	14
				71600	Travel	-	3,000	3,000	3,000	2,000	-	11,000	15
				72100	Contractual services-companies	-	12,000	12,000	6,000	4,000	6,000	40,000	16
				72400	Comm and Audio	-	1,000	1,000	1,000	1,000	1,000	5,000	17
				72800	Information Technology Equipment	-	4,000	1,000	1,000	-	2,000	8,000	18
				73100	Rental and Maintenance-Premises	-	1,000	1,000	1,000	1,000	1,000	5,000	19
				73400	Rental and Maintenance	-	1,000	2,000	1,000	-	1,000	5,000	12
				74200	Audio Visual and Printing Production Costs	-	2,000	2,000	2,000	1,000	1,000	8,000	20
				74500	Miscellaneous	-	1,000	1,000	1,000	1,000	1,000	5,000	
					Sub-Total: Outcome 3 – GEF	-	31,000	32,000	25,000	13,000	19,000	120,000	
		04000	UNDP	71200	International Consultants	-	6,000	8,000	-	18,000	-	32,000	21
				72100	Contractual services-companies	2,000	-	8,000	4,000	-	-	14,000	22
				72200	Equipment and furniture	1,500	8,000	3,500	-	-	-	13,000	23
				74200	Audio Visual and Printing Production Costs	1,500	-	-	-	-	-	1,500	
					Sub-Total: Outcome 3 – UNDP	5,000	14,000	19,500	4,000	18,000	-	60,500	
					Total Outcome 3	5,000	45,000	51,500	29,000	31,000	19,000	180,500	
OUTCOME 4: Piloting integrated building design	UNDP	62000	GEF	71200	International Consultants	9,000	18,000	-	-	-	-	27,000	24
				71300	Local Consultants	6,000	17,000	15,000	3,000	3,000	3,000	47,000	25
				71600	Travel	3,000	3,000	2,000	1,000	1,000	-	10,000	26
				72100	Contractual services-companies	12,000	52,000	30,000	10,000	-	-	104,000	27
				72200	Equipment	-	24,000	-	-	-	-	24,000	28
				72300	Materials & Goods	-	240,000	80,000	40,000	-	-	360,000	29
				72400	Comm & Audio	1,000	1,000	1,000	1,000	1,000	-	5,000	17
				72500	Supplies	1,000	2,000	2,000	2,000	-	-	7,000	30
				73400	Rental and Maintenance	1,000	1,000	2,000	1,000	1,000	-	6,000	31
				74200	Audio Visual and Printing Production Costs	-	1,000	1,000	1,000	-	1,000	4,000	32
74500	Miscellaneous	1,000	1,500	2,000	1,500	-	-	6,000					
					Total Outcome 4	34,000	360,500	135,000	60,500	6,000	4,000	600,000	
Project management	UNDP	62000	GEF	71400	Contractual services-individuals	-	13,000	16,000	9,000	15,000	6,500	59,500	33
					Sub-Total:PM - GEF	-	13,000	16,000	9,000	15,000	6,500	59,500	

		04000	UNDP										
				71400	Contractual services-individuals	12,000	11,000	8,000	15,000	9,000	6,000	61,000	33
				74100	Prof services (Audit)	-	2,500	2,500	2,500	2,500	-	10,000	34
				74500	Miscellaneous	1,500	2,500	-	2,500	500	-	7,000	
					Sub-Total:PM - UNDP	13,500	16,000	10,500	20,000	12,000	6,000	78,000	
					Total Management	13,500	29,000	26,500	29,000	27,000	12,500	137,500	
					TOTAL GEF	50,500	564,500	233,000	116,500	45,000	35,500	1,045,000	
					TOTAL UNDP	30,000	30,000	30,000	24,000	30,000	6,000	150,000	
					TOTAL PROJECT	80,500	594,500	263,000	140,500	75,000	41,500	1,195,000	

Budget notes:

General Cost Factors:

- Short-term national consultants (NC) are budgeted at US\$ 300 per week.
- International consultants (IC) are budgeted at US\$3000 per week.
- DSA's are budgeted at US\$ 200 per day.
- International flight tickets are budgeted at US\$ 1000 per round trip.
- Other expenses are based on UNDP standard costs. The project will look for cost-savings wherever possible using programmatic approach so far applied in Climate Change portfolio, particularly connected with costs associated with office equipment purchase and maintenance, technical support connected with information technologies and logistics, as well as communication costs and vehicle sharing.

Outcome 1:

1. International short term consultants will be hired to guide the PMT and the national consultant throughout the revision and enforcement of codes, and introduce the milestones for implementation based on best available experience in the region on energy performance certification scheme and institutional capacity needs for supporting compliance with code requirements.
2. The local short term consultant will be hired to support the revision and enforcement of codes by providing local knowledge and perspective.
3. The travel costs include the DSA and international flights for International consultants, as well as for study tour for national professionals from MUD to be organized during the second year of the project.
4. These include sub-contract with companies for organization of meetings, trainings, workshops and for development of the sub-legislative normative documentation and training package on Integrated Building Design. Develop methodology for energy auditing and energy passport issuance.
5. Translation, printing and reproduction of legal and technical documentation.

Outcome 2:

6. The International short term consultant will guide the national consultants in evaluation of the applicable best international practices on EE QA/QC schemes and requirements for building insulation materials, components, building envelopes, as well as for entities and laboratories involved in certification procedure. IC will assist the PMT and national professionals in development of the technical specifications of the essential equipment for partner testing laboratories
7. Local consultants will ensure analysis of construction materials produced in the country, market situation analysis in building materials sector, as well as situational analysis on certification and testing of building materials.
8. The travel costs include the DSA and international flights for International Consultant Year 2 and Study Tour for specialists from testing laboratories Year 3.
9. These will include services connected with development of the technical documentation on QA/QC procedures for building materials, testing of the materials to be used in demo project and development of the database of the best available technologies and materials and organization of the workshop for testing laboratories and designers.
10. Equipment includes auditing and testing equipment; computer hardware and software for energy management system, auditing equipment, essential laboratory equipment for EE testing of building materials.
11. Purchase of information technology supplies.
12. Operation and maintenance costs for office equipment and transportation equipment.
13. Translation, printing and distribution costs for promotional and advertising materials.

Outcome 3:

14. Local consultants will be involved in development of the training and outreach strategy under guidance and with assistance of International Consultant (see Note 14). Besides that local consultants will be involved in elaboration of the curricula and delivery of the training.
15. Travel costs will cover international travel associated costs of International consultant and in country travel of national consultants.
16. These include sub-contract with companies for organization of meetings, trainings, workshops and for development of the training documentation (senior staff and professionals at design

- institutes and engineering and architectural faculty of academic institutions) on IBDA concepts and practices and compliance with new, more-efficient building codes, and energy auditing.
17. Internet connectivity, land phone charges postage and pouch costs.
 18. Software purchase for IBD training purposes
 19. Charges for renting conference/training halls and facilities
 20. Development of audiovisual advertising materials (TV program, banners)
 21. The International short term consultant will assist in development of Development of methodology for measuring building performance and related emissions reduction –Year 2. International consultant will be hired to conduct mid term and final evaluation of the project.
 22. This includes organization of the inception seminar – Year1. Development and publication of handbook on passive design and the integrated building design adopted for Armenian conditions.
 23. Includes purchase equipment for organization of the trainings.

Outcome 4:

24. International expert will assist the national project team and partner organizations involved in pilot building design and construction,. will ensure oversight control in application of the requirements of the EE measures in compliance with new building code.
25. Local consultants will provide on side consultations and will supervise the control on application of the proposed measures in the demo building, as well as evaluate GHG reduction potential
26. Travel costs are associated with local filed trips
27. Year1 -the local company has to prepare the demo building design under guidance of International and national consultants, Year 2-3 - local specialized companies will assist in implementation of the proposed measures and technology options according to the elaborated demo building design, and performance of energy audit.
28. Special measuring equipment; heat meters, water meters, temperature sensors with data loggers and solar panels.
29. Costs include construction materials required for incremental measures implementation and ensuring proposed energy performance of the demo building.
30. Purchase of publications (standards), stationery, and other office supplies.
31. Fuel and maintenance cost for vehicle.
32. Translation, and advertisement costs
33. A full time Technical Expert -Task Leader will provide necessary management and technical backstopping and will lead the PMT. Part time financial and administrative assistant will ensure will be hired for day-to-day support,
34. Annual financial audit for the project.

VIII. ANNEXES

ANNEX A: TERMS OF REFERENCE OF KEY PROJECT PERSONNEL

1. Project Task Leader

Under the direct supervision of the UNDP CO Head of Environment & Energy Unit, and in close cooperation with the Climate Change Programme Coordinator and National Project Coordinator (NPC), the Project Task Leader is responsible for the day-to-day management and implementation of the UNDP-GEF project, including all project administrative matters. All work of the Task Leader will be carried out in line with the Country Programme Action Plan and in full compliance with the UNDP Rules and Regulations.

Job content

- (i) Ensure efficient implementation and development of activities assigned under the project in accordance with approved Project Document;
- (ii) Lead, supervise, and monitor project implementation process,
- (iii) Act as Project asset management custodian and ensure maintenance and update of the project office inventory records in line with UNDP rules and regulations.
- (iv) Provide substantive support in the development of the project planning documents; monitor work plan implementation.
- (v) Provide substantive support in identifying and recruiting the competent staff and subcontractors, formulate their responsibilities as well as appraise their performance.
- (vi) Monitor and analyze the adequacy and content of the technical reports and project deliverables to achieve the project outcomes/outputs.
- (vii) Prepare reports on the operational status of the Project to the implementing, executing and funding agencies.
- (viii) Liaise with the Government, regional and local authorities, private sector, civil society organizations, and international partners to ensure participatory approach for achievement of project objectives.
- (ix) Provide technical backstopping and guidance to the national team of experts and subcontractors.
- (x) Coordinate the development of networking and information system activities relevant to the project implementation in the scope of the UNDP programme.
- (xi) Analyze the outputs, organize surveys and awareness rising campaign;
- (xii) Ensure organization of workshops and other meetings, prepare briefing notes, background papers and make presentations.
- (xiii) Ensure technical and organizational support of key institutes in the beginning of pilot implementation;
- (xiv) Ensure regular update regarding course of Project implementation on www.nature-ic.am web-site.
- (xv) Perform other duties as required.

Outputs

- Successful and timely Project implementation in accordance with objectives, schedule and planned budget.
- The quality of work of the Project Task Leader will be assessed by successful achievement of general objectives of the Project, in particular:
 - Preparation of annual Project reports, working plans and other relevant Project documents;
 - Documents on informative campaigns.

Remuneration

Remuneration is to be made on monthly basis according to the Contract.

Required qualifications

Education: Advanced University Degree in energy or relevant field, economics, finance, business administration and management.

Experience: Minimum of 5 years of related working experience in project implementation and management. The experience in international project management is an advantage. Demonstrated ability of cooperation with stakeholders: government officials, scientific institutions, NGOs, private sector and international financing institutions. Experience with UNDP-GEF project implementation procedures is highly desirable.

Languages: Excellent knowledge of Armenian and English, with exceptional writing skills. Ability to review, prepare and present training material and make oral presentations, both in Armenian and English.

Other skills: Strong interpersonal and communication skills, ability to take decisions. Good knowledge of computer software (MS Office, and task relevant specific software).

2. Administrative and Finance Assistant

The Administrative and Finance Assistant will work under the direct supervision of the National Project Coordinator and provide assistance to project implementation in the mobilization of inputs, the organization of training activities and financial management and reporting.

Job content

The Administrative and Finance Assistant will be responsible of the following duties:

- (i) Prepare all payment requests, financial record-keeping and preparation of financial reports required in line with NIM financial rules and procedures
- (ii) Assistance to the recruitment and procurement processes, checking the conformity with UNDP and the Government rules and procedures
- (iii) Assistance to the organization of in-country training activities, ensuring logistical arrangements
- (iv) Preparation of internal and external travel arrangements for project personnel
- (v) Maintenance of equipment ledgers and other data base for the project
- (vi) Routine translation/interpretation during projects meetings and drafting of correspondence as required
- (vii) Maintain project filing
- (viii) Other duties which may be required

Qualifications

Education: University Degree, some training in business and/or administration desirable (finance or accounting)

Experience: At least five years administrative experience

Skills: Good organizational skills, good computer skills, including spread-sheets and database

Languages: Fluent in Armenian and English

Local Consultants

3. Building Codes Expert

Job content

- (i) Provide technical expertise and advise for development of new building codes;
- (ii) Calculation methodology for assessment of thermal energy performance and other relevant norms and standards to incorporate mandatory provisions for integrated building design in new building codes such as climatic design, use of energy efficient materials and equipment.

Qualifications

At least fifteen (15) years of working experience as a specialist in the field of building codes and efficient buildings;

- Academic qualification in the field of energy, engineering, architecture, or construction.
- Practical experience in implementation and monitoring of model building codes
- Working experience in CIS countries in the area of building codes
- Strong awareness of international best practice in the field of building codes

4. Architect/Designer

Job content

- (i) Provide recommendations on application of Integrated Building Design (in close collaboration with international consultants
- (ii) prepare tender documentation for building construction work
- (iii) ensure technical oversight over the process of construction of two new energy efficient schools as pilot projects;
- (iv) contribute to the development of educational curricula for university and act as trainer during training workshops for architects and engineers on integrated building design (IBD)

Qualifications

- University degree in buildings construction and design or related area;
- At least 10 years of work experience in the field;
- Good knowledge of building codes and other relevant norms and standards;
- Experience in research and analysis;
- Working experience with international donor organizations is an advantage;
- Good communication, analytical and writing skills;
- Good knowledge of computer and information technologies;
- Knowledge of English is an advantage.

5. Institutional Capacity Development Expert

Job content

Support the Ministry of Urban Development in preparation of new enforcement procedures for building codes, building and materials certification programme and design TOR for training programme and other capacity building activities for building inspectors.

Qualifications

At least ten years of working experience as a specialist in the field of building codes and efficient buildings;

- Academic qualification in the field of energy, engineering, architecture, or construction.
- Practical experience in implementation and monitoring of model building codes
- Working experience in CIS countries in the area of building codes
- Strong awareness of international best practice in the field of building codes

6. Construction Materials and Insulation Specialist

Job content

- (i) Make analysis on construction materials used in building construction sector;
- (ii) collect information on local producers of construction materials;
- (iii) propose locally available energy efficient materials that can be used for building construction;
- (iv) development of a data-base and catalogue on best available materials and construction materials;
- (v) provide recommendations on the implementation of testing and certification of building and insulation materials
- (vi) develop technical specifications for the procurement of basic equipment for testing laboratory

Qualifications

- University degree in civil engineering, construction or related area;
- At least 10 years of work experience in the field;
- Good knowledge of building codes and other relevant norms and standards;
- Good knowledge of modern insulation techniques;
- Experience in research and analysis;
- Working experience with international donor organizations is an advantage;
- Good communication, analytical and writing skills;
- Good knowledge of computer and information technologies;
- Knowledge of English is an advantage.

7. Engineer

Job content

Consult on application of Integrated Building Design in demo building, provide on-site consultations and monitor the application of the planned measures, act as trainer during training workshops for architects and engineers on IBD.

Qualifications

- Certified civil engineering consultant according to local requirements and law.
- At least 8 years experience in building planning and construction.
- Outstanding time-management and organizational skills.
- Knowledge of English is an advantage.

8. PR Specialist

Job content

Design and undertake promotional campaign to disseminate the benefits of application of the building codes, as well as results of IBD pilot among decision makers, building industry professionals, real estate brokers and building occupants

Qualifications

- University degree in public relations / journalism / economics;
- Excellent communications, negotiation and presentation skills;
- 3 years of work experience (experience with an international organization is an asset);
- Computer literacy;
- Experience in web content development is an asset;
- Proficiency in English;
- Ability to prioritize multiple tasks and work under pressure.

9. EE Training and Curriculum Development Specialist

Job content

Contribute to the design of new training curricula and guide on EE building design and participate as a trainer in roll-out of the programme in first stage (along with relevant international experts).

Qualifications

At least five years of working experience as a specialist in the field of building codes and efficient buildings;

- Academic qualification in the field of energy, engineering, architecture, or construction.
- Practical experience in implementation and monitoring of model building codes
- Strong awareness of international best practice in the field of building codes

10. Energy and GHG Monitoring Specialist

Job content

Review and analyze existing information sources; effectiveness of collection, assessment, and use of data on energy consumption in buildings and develop recommendations on institutional and technical aspects for establishment of a unified energy consumption and GHG monitoring system in buildings.

Qualifications

- At least five (5) years of working experience as a specialist in the field of GHG emission reduction and climate change impacts;
- Academic qualification in environmental science, energy, or economics, with specialization in GHG emissions related aspects. He/she shall have knowledge of economics and/or energy economics;
- Practical experience in implementation and monitoring of pilot and demonstration projects, working experience in developing countries and CIS countries is an asset;
- Practical experience in financial and economic analysis and GHG emission reduction and carbon trade issues;

-Good ability in partnering and networking;

International Consultants

11. EE Building Code Expert

Job content

Assist the working group established under Ministry of Urban Development in drafting the new energy performance-related codes and incorporation of international best practices.

Qualifications

- At least fifteen (15) years of working experience as a specialist in the field of building codes and efficient buildings;
- Academic qualification in the field of energy, engineering, architecture, or construction.
- Practical experience in implementation and monitoring of model building codes
- Working experience in CIS countries in the area of building codes
- Strong awareness of international best practice in the field of building codes
- Proficiency in English; preferably proficiency in written Russian.

12. Architect/Designer

Job content

- (i) Provide advice on development of improved energy performance codes (IBD) (30%)
- (ii) Technical oversight over Integrated Building Design pilot projects construction and monitoring, including consultant coordination and site inspections for new demo residential building (60%)
- (iii) Act as trainer for training workshops for architects and engineers on IBD, as well as for EE building educational curricula in universities (10%)

Qualifications

- At least ten (10) years of working experience as a specialist in the field of design and construction of energy efficient buildings, working knowledge of the relevant application of renewable energy technologies/systems and bioclimatic design will be an asset;
- Academic qualification in building construction energy, preferably with specialization design and construction of residential buildings. He/she must have knowledge of the integrated building design;
- Sound practical experience in implementation and monitoring of pilot and demonstration projects related to design and construction of EE in buildings;
- Proficiency in English, excellent analytical and presentation skills;
- Excellent interpersonal and cross-cultural communication skills;
- Previous experience of working in CIS countries on EE buildings projects will be an asset.

13. Civil Engineer/EE Specialist

Job content

- (i) Provide advice on development of improved energy performance codes (civil engineering) (30%)
- (ii) Advice on civil engineering planning following Integrated Building Design methodologies for new residential demonstration building (60%).
- (iii) Act as trainer for training workshops for architects and engineers on IBD, as well as for EE building educational curricula in universities (10%).

Qualifications

- At least Masters Degree in civil engineering;
- At least 8 years experience in building planning and construction, preferably with direct experience with highly-efficient buildings and IBD;
- Fluency in written and spoken English;
- Outstanding time-management and organizational skills;

ANNEX B: STAKEHOLDER CONSULTATION

Notes on Stakeholder Consultation Workshop

“Improving Energy Efficiency in Buildings” Full-sized Project Preparation Grant UNDP/GEF

*“Best Western Congress” Hotel, “Picasso” Hall
6 November, 2009*

PARTICIPANTS: The workshop was attended by 44 participants (the list is attached).

OBJECTIVE: Present to the stakeholder parties’ discussion the main approaches of the project document, demonstration (pilot) building(s) selection criteria, and key orientation for cooperation.

The workshop was held according to the agenda (attached).

I. Presentations

Welcome address was delivered by Mr. Dirk Boberg, UNDP Deputy Resident Representative, and Mr. Narek Sargsyan, Deputy Minister of Urban Development of the RA, the RA Chief Architect. Mr. N.Sargsyan especially emphasized innovative and substantial approach to architectural and organizational solutions in the frames of the project, and mentioned significant potential for energy saving.

Mr. Samvel Srabyan presented main issues, priorities and needs of improving energy efficiency in buildings in Armenia. He described the country’s distinctive features, including climatic conditions, and the RA housing stock, including distribution of multi-apartment buildings by their envelop materials. He addressed energy saving projects implemented in Armenia, adopted strategic documents, stressed current issues and obstacles and presented future steps.

Mr. Dmitry Goloubovsky addressed UNDP/GEF Monitoring and Evaluation rules and requirements and presented main principles of GEF project formulation and distribution of managerial functions between UNDP and GEF.

Mr. Vahram Jalalyan presented the project’s objectives, tasks and expected results, described components of Project Preparation Grant stage and Full-Sized Project.

Ms. Susan Legro reported on EE issues in UNDP-supported projects. Starting with international context and background of similar projects in the region, she presented lessons learned from them. In particular, she stressed the importance of strictly following the building codes, of quality control, testing and certification, the necessity to foster public relations, education and training, and presented energy efficiency experience in demonstration (pilot) buildings.

Ms. Lisa Surprenant presented the integrated building design approach and principles of demonstration (pilot) building selection. Particularly, she addressed objectives of and motivation for demonstration (pilot) building construction, stressed the necessity of differentiating stakeholders’ objectives, presented construction technologies and replication potential, criteria and site selection, construction tactics and technologies with special stress on proper coordination of the project and importance of team work.

II. Questions and Recommendations

Seminar participants showed high interest in integrated building design approach meaning, content and applicability. Mr. V.Jalalyan provided a brief answer clarifying that energy efficiency issues are taken into account from design stage on, thus empowering optimal solutions and lowering incremental costs of construction. During the workshop, the issues were continuously clarified in presentations and discussions.

Mr. M.Vermishev invited the participants’ attention to multiple factors that make the project base line identification difficult, especially on currently insufficient heat supply.

Mr. L.Vardanyan noted importance contemporary energy saving promoting norms and encouraging instruments introduction, and of the issue substantiation.

Mr. S.Gevorgyan addressed the issue of restoring and expanding production of natural insulation materials in the RA. He provided extensive technical data on the issue and referred to other countries' experience (Russia, Finland) in applying thermo-blocks. He stated that the issue of not following the adopted standards of the sector can be solved via using thermo-blocks produced in the RA. He informed the participants of the works of urban development and energy savings commission within the RA Ministry of Energy and Natural Resources and referred to the main actors firms of the market (Akcern, Horizon-95, YerevanShin, and Glendale Hills).

Responding to Mr. V.Zinalyan's question, Ms. L.Surprenant clarified that, according to preliminary estimations, the cost of construction may rise by about 10 per cent to meet energy efficiency criteria.

Mr. Z.Melikyan presented works of other projects, particularly, that of International Science and Technology Center (ISTC), in which his University participates. He stressed importance of integrated energy efficiency and saving projects and noted that building and its heat supply system must be considered in their unity to ensure reduction of thermal energy consumption in buildings including thermal insulation optimization via integrated approach. Necessity of mathematical modeling and software application and design of renewable energy consuming buildings was stressed; importance of continuous cooperation with scientific research and education stakeholder institutions was noted.

Participants were interested in the chosen option for heat supply for the demonstration building, in the status of building selection (final or not), and in sequence of works to be performed. It was clarified that building selection was preliminary. Criteria of selection are GoA co-financing, typical design, good replication capacity, and opportunity to compare with base lines and to conduct monitoring. Although building position is not possible to change, it is possible to use new materials, interior engineering selection of heating system, use of solar energy etc. (M.Vermishev, S.Srapyan, D.Harutyunyan)

Participants discussed ventilation as a humidity regulation factor. It was stressed that these issues would be addressed in the demonstration building within integrated building design approach and accounting for all the relevant factors. The participants agree that building norms must be strictly observed and that even having a lot of analysis and modeling done it is important to construct a demonstration building to test out various construction tactics and techniques. A common concern is that good designers become few relevant to their total numbers and the rest of them are not largely familiar with new norms of energy efficiency. (H.Hakobyan, V.Jalalyan, L.Surprenant)

Participants agreed that ICN "Thermal protection of buildings" needs to be harmonized with Armenian conditions, including climate, energy and insulation costs etc. For instance, thermal insulation optimal resistance coefficient is 2.2 for Ararat valley, 1.8 for Syunik (Kapan), 2.6 in Gyumri etc. There is an operating testing laboratory in Armenia that allows identifying characteristics of building materials (recently, as required by new standards, contemporary equipment was procured), particularly, to measure heat conduction coefficient, however, it is not authorized to certify insulation materials. Importance of attracting large-scale investment for applying technologies ensuring affordable heating for the population was stressed. (H.Hakobyan, R.Arsenyan)

In reply to a proposal to pay attention to not only buildings being constructed, but also to existing housing stock, whose potential for energy saving and efficiency is enormous, it was noted that the World Bank was already implementing such a project financing the relevant measured in public buildings. In connection with elaborating a new block of normative acts for the sector, recommendations are already submitted for UNDP and R2E2 consideration. (K.Khachatryan, A.Martirosyan, H.Tsughunyan)

Participants then turned to building codes observance issues in the process of construction. The example of Eastern Europe was discussed, where the issue still holds despite high quality of building codes. Importance of everyday technical quality control by a qualified specialist was noted. There is a requirement that an energy efficiency specialist be involved in the building design process. Participants were informed that "technical quality control" activity was recently licensed thus laid foundation for their institution. Difficulties of resolving the issue in the capital city and in the other marzes (regions) were stressed as was importance of local self-government bodies' capacity building in construction norms observance control. (A.Pasoyan, A.Vardanyan, S.Srapyan)

Participants were informed of envisaged amendments to the RA Law "On energy efficiency and renewable energy" that would make energy audit mandatory from design stage on for all kinds of projects financed by the state budget. There is a strong intention to make energy audit mandatory in

technical inspections also for private proprietors. The state auditor conclusion must contain a separate section on energy efficiency, which is also connected with the RA Law “On urban development”. Difficulty of introducing financial mechanisms was especially stressed in connection with allotting amounts from the state budget for resolving energy efficiency issues to meet GEF and other donors’ requirement of GoA co-financing. As noted, it took two years to convince the RA Ministry of Finance to introduce energy carriers tax. Currently, the RA Ministry of Energy and Natural Resources is ready to submit application for the state budget allotment and elaborates a package of amendments to the legislation. The new tax will be a part of excise tax rate of up to 5 per cent of imported fuel’s (gasoline and diesel) value. The amounts collected will go to a special fund to be used for energy efficiency and saving promoting activities and projects by the decision of the board of trustees. As expected, the state’s participation/co-financing of resolving this kind of issues will contribute to growing interest of other investors. (H.Tsughunyan)

The issue’s importance was then stressed in the context of co-operation with the EU countries as energy tax is a part of Armenia’s relevant concept and action plan. It was noted that energy tax should be imposed on all energy carries, including gas; however, it was not – to avoid possible social tensions. Examples of Thailand and Latvia were discussed where the established auditors’ institutions were perceived as market counterparts. In particular, costs preliminary audit performed by local companies are covered from the tax fund completely and detailed audit – by 50 per cent. In Thailand, each liter of liquid gas sold is taxed and the fund grew to 440 million USD in 5 years, while effect of energy efficiency law extends to not only industrial enterprises, but also to large buildings. On importance of energy audit, it was mentioned that State Engineering University of Armenia admits student of “energy efficiency management” specialty for two years already. (A.Pasoyan, L.Surprenant, H.Tsughunyan)

Concluding the seminar, Mr. A.Martirosyan asked the participants to come up with their opinions and recommendations within one week thereafter.

III. Workshop Participants:

1. Endorsed approaches laid in the foundation of the Project Document,
2. Recommended to perform the most detailed possible study of cooperation opportunities with local producers of insulation materials,
3. Emphasized importance of cooperation organization with Yerevan State University of Architecture and Construction, and
4. Approved pilot buildings selected by the Project implementation team.

Ministry of Urban Development, Head of Communal Division at
Housing Provision and Communal Policy Department

S.Srapyan

Secretary:
The Project Task Leader

V.Jalalyan

STAKEHOLDER CONSULTATION
6 November, 2009
LIST OF PARTICIPANTS

Ministries and State institutions		
1.	Narek Sargsyan	Ministry of Urban Development, Deputy Minister, Chief architect of RA
2.	Tigran Sekoyan	Armenia Renewable Energy and Energy Efficiency Fund
3.	Samvel Srapyan	Ministry of Urban Development, Head of Communal Division at Housing Provision and Communal Policy Department
4.	Ovsanna Karapetyan	Ministry of Urban Development, Head of Technical Norms and Standards Division
5.	Sevada Hayrapetyan	Ministry of Urban Development, Head of State Construction Inspection
6.	Levon Vardanyan	Ministry of Energy and Natural Resources, Head of Development Division
7.	Hrach Tsughunyan	Ministry of Energy and Natural Resources, Head of Energy Saving Department
8.	Vanush Zinalyan	Yerevan city Municipality, Communal Economy Department, Head of Condominiums Coordination Division
9.	Hovhannes Nunyan	Yerevan city Municipality, Government Agencies' Buildings maintenance and exploitation SNCO
10.	Arsen Darbinyan	Lori marz, Deputy Marzpet
11.	Kamo Nersisyan	Shirak marz, Advisor to Marzpet
12.	Razmik Arsenyan	"Energy Research Institute" CJSC, Expert
International Organizations		
13.	Dirk Boberg	UNDP Deputy Resident Representative
14.	Dzmitry Halubouski	UNDP/GEF Regional Adviser
15.	Armen Martirosyan	Environmental Governance Portfolio Analyst at UNDP Armenia
16.	Artur Koshnakyan	WB, Infrastructure Economist, Energy and Infrastructures
17.	Samvel Ayvasyan	Advance Engineering Associates International, Engineer
18.	Astghine Pasoyan	Alliance to Save Energy, Coordinator
19.	Tigran Parvanyan	IFC
Design institutions, universities, NGOs, ESCOs		
20.	Zohrab Melikyan	Yerevan State University of Architecture and Construction, Professor
21.	Manik Khachatryan	"National Institute of Standards" CJSC, Head of Standards Research and Extension Projections Division
22.	Grigor Azizyan	"ArmProject Institute", Director
23.	Susanna Sahakyan	"Yerevan Project Institute", Senior Specialist
24.	Hamlet Hakobyan	"Ecoperlit" LLC, Director
25.	Suren Gevorgyan	"Karakert stone-melting factory" OJSC, Chairman of Board of Directors
26.	Georgi Janyan	Independent Expert
27.	Kamo Khachatryan	"Millennium Communities Development Foundation" NGO, President
UNDP/GEF Project		
28.	Diana Harutyunyan	Climate Change Projects AWP Coordinator
29.	Robert Kharazyan	Heat Supply Expert, Team Leader
30.	Arusyak Ghukasyan	Task Leader
31.	Sveta Galoyan	Expert on Institutional Issues
32.	Vahram Jalalyan	PPG Project, Task Leader
33.	Susan Legro	PPG Project, International Consultant on Energy Efficiency and Renewable Energy
34.	Lisa Surprenant	PPG Project, International Consultant/Design and Construction of Energy Efficient Buildings
35.	Arsen Karapetyan	PPG Project, Expert on Architecture/Construction & EE
36.	Alexander Vardanyan	PPG Project, Expert on Building Materials & Construction Quality Control
37.	Gayane Tumanyan	Ministry of Urban Development
38.	Anton Hovhannisyan	Ministry of Urban Development
39.	Anahit Harutyunyan	Ministry of Urban Development
40.	Gagik Tadevosyan	Ministry of Urban Development
41.	Hayk Esayan	R2E2 Fund Armenia
42.	Manuel Margarian	Hovnanian International
43.	Armen Vardanyan	"ShinCertificate" Marketing Division Responsible
44.	Mihran Gyulzadyan	Architect Expert

2. List of the large construction and mounting organizations in Armenia

	Name of Company	Director	Address	Phone	Fax	URL / e-mail
1	"Horizon-95" LTD	Gagik Galstyan	Amiryan 26, Yerevan	091 409305; 010 538852	010 538847	www.horizon95.am horizon@netsys.am
2	"Hayk Arshin" LTD	Aragats Akhoyan	V.hambardzumyan 10, apt. 22, Yerevan	093 605040; 010 239932	010 239768	haykarshin@mail.ru
3	"Araratshin" OJSC	Georgi Tovmasyan	12 Khanjyan str., Ararat	091(093) 404575; 0238 42463	0238 42470	
4	"Bostan" LTD	Mnacakan Bostanjyan	vilage Jrahovit, Ararat marz, RA	093 204240; 010 229133	010 229133	bostan@xter.net
5	"Yerevanshin" OJSC	Vazgen Poghosyan	74/2 Shiraki str., Yerevan	091(093) 406900; 010 427205	010 427202	www.yerevan-construction.com yershin@netsys.am
6	"Kanaka" OJSC	Hayk Hovivyan	4 Njdehi str., Vanadzor	091 407467; 0322 40477		kanaka@freenet.am haykhov@yamdex.ru
7	"Haykapal" CJSC	Shahbaz Harutyunov	19a Koryuni str., Yerevan	093 436904; 010 529347	010 520362	haykapal@web.am haykapal@netsoft.am
8	"Father & Son Adamyan" LTD	Rafik Adamyan	Apt.2, 40 Gajegortsneri str, Yerevan	091 407152		
9	"Hydroenergashin" CJSC	Perch Davtyan	67 Hanrapetutyan str., Yerevan	091 402503; 010 523801	010 523322	hidroshin@web.am
10	"Shirak engineering construction" CJSC	Sos Qocharyan	76a Musaelyan str., Gyumri	091 411581		
11	"Sahakyanshin" CJSC	Suren Sahakyan	117/1 Araratyan str., Yerevan	091 401333; 010 462300	010 422501	sahakyanshin@inbox.ru
12	"Spitak tnak" LTD	Stepan Akhoyan	56 Mamikonyants str., Yerevan	091 406074; 010 239181	010 231969	www.spitaktnak.org spitak_tnak@netsys.am
13	"Tonous" LTD	Ashot Tonoyan	5/18 Gogol str., Yerevan	091 405091; 010 610790	010 299022	www.tonus.am
14	"V. Aghababyan" LTD	Vahagn Aghababyan	5 S.Aghababyan str., Vanadzor	093 990102; 0322 44528		vaghababyan@yandex.ru

3. List of the largest architectural design organizations in Armenia

	Name of Company	Director	Address	Phone	Fax	URL / e-mail
1	"Armproject" CJSC	Grigor Azizyan	1 Charents str., Yerevan	091 415113; 010 575895	010 576571	www.armproject.am info@armproject.am
2	"Yerevannakhagits" CJSC	Gourgen Mousheghyan	1/3 P.Byuzand str., Yerevan	091 431397; 010 562711	010 580063	yrpro@yandex.ru
3	"HARG" LLC	Gagik Harutiunyan	29, Demirchyan str. 4/a, Yerevan	091 412931; 010 541704		harg@mail.ru harg@xter.net

ANNEX C: OVERVIEW OF LEGISLATION

International Legislation and Regulations

According to the Interstate Building Code 2.04-2004, at design stage of buildings it is necessary to define the rate of energy efficiency A, B or C. The selection of energy efficiency rate is made at request of the customer or building owner. The assessment of energy efficiency rate is based on the specified costs of thermal energy on maintenance of parameters of microclimate in premises taking into account the climatic placement of building. Microclimate parameters in premises of residential and public buildings are specified by the national standard GOST 30494. The control of thermo technical parameters at the stage of designing and designs expertise of their conformity to norms MCH 2.04 - 2004 should be realized according to the energy certificate.

The quality control and conformity of thermal protection of buildings and its separate elements to norms MCH 2.04-2004 are done by an accredited laboratory through experimental definition of the basic parameters on the basis of national standards relative to test methods of building materials, structures and units integrally. If factual parameters do not meet the design values it is necessary to develop measures aiming at removal of defects.

National Legislation and Regulations

The Law on Urban Development of the Republic of Armenia (RoA)

The Law on Urban Development is the basic law in the field of urban development. It sets up main provisions of urban development activity and regulates relationships connected with that activity. As subjects of urban development activity can act legal and physical persons, as well as the Republic of Armenia, local self-government bodies and other subjects also. Rights and responsibilities of developers in the course of urban development activity are established in the law. In particular they are obliged to carry out construction according to the architectural-construction designs approved by the procedure set up by the law and based on the construction permit. Developers get architectural-planning order from the bodies of local self-government. By that order design and urban development mandatory conditions, requirements and limitations are set up towards the object. Designs elaborated based on the architectural-planning order and technical terms for engineering infrastructure design, construction and maintenance pass audit according to the procedure set up by government. Organizations caring out design audit are licensed organizations which conduct design audit based on contracts either with the developers or the designer. Developers are obliged to get approvals from different interested parties (e.g. fire protection inspection, etc.) It is necessity to define the list of interested parties by legislation.

During construction the developer is obliged to ensure construction quality technical control and author (design) control for the urban development object, to finish the development within the time limits established by the construction permit and finally to ensure the documentation of completed construction object's commissioning. The law sets up rights and responsibilities of designers and builders.

The law on responsibility for legal breaches in the field of urban development

This law sets up appropriate legal basis with which legal persons acting in the field of urban development can be prosecuted with the aim of protecting interests of citizens, society and state, of ensuring the implementation of requirements of legal acts, norms and standards in all stages of urban development activity. Particularly cases of legal breaches are provided such as penalty assignment, suspension of license validity, termination of license validity. The law includes provisions on subjects making breaches and the amounts of their penalties and terms.

Civil Code of the RoA

The RoA Law on Management of Multi-apartment Building

The RoA Law on Condominium

Article 224 of the Civil Code sets up that owners of multi-apartment building with common shared ownership right own bearing structures of the building, inter floor coverings of the building (ceilings, floors), basement, technical floors, roof, as well as entrances, stairwells, stairs, elevators, elevator and other shafts, mechanical, electrical, sanitary-technical and other appliances and areas which are not in ownership of other persons and serve more than one unit and for the common service of the entire building.

According to the current legislation in fact are defined two types of ownership in a multi-apartment building: apartments as individual property and common use areas of multi-apartment building as common shared property of building owners.

A management body is established in multi-apartment building with a goal of managing and maintaining of common shared property.

The law defines mandatory norms of maintaining of common shared property, non-implementation of which can bear a direct risk to the common shared property, lives, health of property owners and other people, to the persons' property, etc.

According to the law on management of multi-apartment building the management of common shared property of the building can be realized with the following types:

- a) Through condominium – a legal person established by the property owners
- b) Through licensed manager (of representation)
- c) Through trusted manager.

As of January 1st 2008 Armenia's total housing stock is comprised of 84.5 million m² which worth about 8-9 billion USD. Multi-apartment housing stock is comprised of about 25 million m² (or 35.6% of the total) located in 22,000 buildings. It is mainly concentrated in urban communities (92%). 12000 buildings out of 22000 are 3 and more storey buildings. About 39% of the buildings had been constructed until 1970. The share of buildings built during 1970-1990 is 44.4% and for those after 1990 – 16.4%.

Sector strengths: 95% of the multi-apartment housing stock has been privatized since getting the independence. Associations of housing owners, mostly condominiums have been created in 73% of the multi-apartment housing stock. The sector's legislation is mainly regulated.

Sector weaknesses: Omissions (weakness of supervisory and reporting mechanisms, abolishment of centralized heating systems and of state support system) of state policy of housing stock management and heating supply have resulted in an unsatisfactory technical condition of buildings and energy wastage.

For clarifying and improving of management mechanisms, legislative field regulating relationships in the sector of management of multi-apartment building, as well as improving of institutional framework it is necessary to elaborate a package of drafts of legal acts including the following issues of:

- passportization of multi-apartment buildings and registration of the common shared property
- improvement of reporting system, including introduction of housing register (information/registration system)
- improvement of the supervisory system towards implementation of mandatory norms of maintenance of common shared property of multi-apartment buildings (in part of state bodies supervising in the sector and the head of community)
- promotion of involvement of the private sector into the field (selection of service companies through tenders and licensing of property managers)
- definition of minimal amount of mandatory fees for implementation of mandatory norms of maintaining common shared property of multi-apartment building

- procedures of state support provision, evaluation of project proposals, monitoring and supervision of results
- definition of performance assessment criteria of activity of management bodies of multi-apartment buildings.

The provision of architectural-planning order is regulated by the procedure established with the decree #1473-N of the Government of Republic of Armenia dated 29.08.2002. Particularly, necessary steps which should be implemented by developers are defined. The validity of the order should not exceed 2 years which is short and not reasonable. The developer applies for the order, if the construction works need a construction permit to implement.

It is necessary to mention that in general the duration of order provision or refusal is not maintained, which is related with the absence of appropriate urban development documentation and/or the necessity of performing additional research. It is necessary to provide the architectural-planning order together with the technical terms for connecting to the engineering networks which will ease the developer's work. The provision of the technical terms can be organized in a centralized way by municipality on a fee-for-service basis. Besides that the municipality can also provide services to property developers for temporary alignments of networks and installation of object's connections to the networks with similar terms. It is important to mention that at present the provision of the order is done incomplete. It is necessary to prepare a construction passport for each land plot in which construction general plan, development percentage, usage, maximum height of the object, technical terms for connecting to the engineering networks, engineering geological surveys materials and other important details can be included. By the way, there was such a practice in Yerevan Municipality in the past.

Main requirements for the structure and content of design documentation of buildings and structures are defined by decree N273-N of the Minister of Urban Development dated 29.11.2006 "On approval of rules for defining of the structure and content of design documentation of habitable, public, production buildings and structures". It is worth mentioning that the architectural-planning order, design task submitted by developer, technical condition report in case of reconstruction/reinforcement/modernization of the objects, engineering-geological surveys materials and technical terms for connecting to the engineering networks and other primary data are considered as basis for elaborating of design documents. The design documents can be elaborated in one stage: "Working design" or in two stages: "Design" and "Working documents". For each stage the structure of necessary documents are defined in which separate sections are included. The sections have text materials and drawings. It is worth to mention that at present several sections are not elaborated by design institutes. In particular, environment protection, construction organisation, cost estimate documents, etc.

Due to not receiving of positive conclusion from environmental audit organization as a result of the absence of "environment protection", the project implementation can be prolonged with uncertain time. Due to the absence of "construction organization" section in the design documents there exists a waste of time for getting an appropriate permit from road police and city authorities, especially in case of construction in the center of Yerevan and near the main streets.

Due to the absence of cost estimate documents in the designs the amounts of fees for design elaboration, construction quality control and author control, design audit are becoming volatile because the basis for calculation is the rough construction cost of the object.

It is also worth mentioning that often the design institutes elaborate "until zero level" designs in order to allow developers to start construction works until the design documents are complete.

Adjacent to the decree lists of technical-economical indicators for habitable and public buildings and structures are provided in which important indicators are included such as building's floors, number of apartments, total area, consumption of electricity, water and natural gas per area, construction total cost, etc. It is important to note that in practice the technical-economical indicators, especially related to the consumption of electricity, natural gas and water are not provided in designs.

By the decree #812 of the Government of Republic of Armenia dated 3.12.1998 "On establishing the order of designing, expertise, confirming, approving and changing of habitable, public, industrial buildings and structures drawings" main requirements are set up for the above-mentioned activities.

It is necessary to mention that the communal services providers which provide technical terms for connecting to engineering networks enforce developers to make orders to them for construction works with higher and unjustified prices. Besides that they create bureaucratic obstacles for developers for connection and sealing works. Later on after the construction is complete the networks are transferred to the balance of service provider with which it supplies gas, electricity and water and charges fees and payments from owners for services. What can be done in cases, when there are no networks in sold large land plots and there are no engineering networks nearby? The state could install necessary engineering networks in the subject land plots and sell them with higher prices. By the way, the durations of technical terms for connecting to engineering networks are short and not reasonable.

By the decree #96 of the Government of Republic of Armenia dated 02.02.2002 "On establishing the order of auditing of urban development documentations" main requirements are set up for the auditing activity. The main goal of the design audit is to ensure the appropriateness of selected design solutions with the requirements of the legislation and normative-technical documents of the Republic of Armenia. Design audit is not required for works not requiring construction permit. Based on the importance of urban development documentations as well as with the complexity of objects being implemented there are three types of design audit: special complex audit, complex audit, simple audit.

Design audit of urban development documents can be carried out by legal persons licensed according to the order set up by legislation. The urban development documents are submitted for audit by developer (or its representative) as well as by design organization in case of agreement with developer. It is suggested to legally ban the submittal of design documents by design institute for auditing taking into account the fact of being an interested party.

At present there are about 30 licensed design audit organizations operating in the country. In general the performance of the design audit organizations is not satisfactory. Often it is possible to get a positive audit report for any type of quality of design documents with appropriate payment.

At present it is quite possible to get audit report for the same object's design documents from more than one audit organization; for example to get an audit report on architectural-construction section from one and second report on engineering sections from another audit organization. It is necessary to legally ban such cases. In many cases, audit reports are prepared incomplete, represent only facts from design documents without serious analysis, comments and recommendations. It is suggested to make an attachment to the decree with a completed example of design audit report according to the article 21 of the above-mentioned decree which can serve as a guide for audit organizations. Besides that it is necessary to complete "main technical-economical indicators" with "including energy efficiency" words.

It is also important to mention that the duration for approval of design documents is mostly not maintained by municipalities. It is important that the side approving design documents be keen in ensuring the completeness of design task submitted by developer according to the Annex 3 of the decree. It is suggested to include object's energy efficiency indicators, i.e. kWh/m²/year, in the "other important indicators" of the design task and to mention about it in the design audit report.

Construction permission order is set up by the decree #91 of the Government of Republic of Armenia dated 02.02.2002 "Order on permission for construction and demolition in the RoA". Construction permit is given for 2 year time period, if there are no other terms planned. Construction permit is not needed for current repairs, internal finishes and upgrading works. Construction permit is given by head of community with the approval of the design documents. It is worth mentioning that the validity of construction permit is not kept in many cases due to different objective and subjective reasons. Due to delays of different approvals conditioned with administrative performance the construction duration can be indirectly extended. Construction registration journals are small and need substantial enlargement. As regards to getting construction permit it is important to mention that developers are enforced to pay large sums of money to different funds pointed by municipalities which is illegal.

According to the Government of Armenia decree #626-N dated 08.05.2003 "On approval of order of documentation of completed construction commissioning" the acceptance of completed construction commissioning is documented through commissioning act after completion of all works planned by design documents and performing of construction object's turnover by established order. Completion act is documented in the community – by head of community and in territories outside communities' administrative boundaries – by the governor of the region. Completion act is the base for registering of the newly-built building. It is suggested to include energy efficiency indicators in the section "d)" of the completion act.

Taking into account the fact that developers mostly build residential buildings for selling purposes and are not the main interested party, it is necessary to create a mechanism for actively involving future owners in the commissioning documentation process. Such mechanism could be the creation of owners' interim association which is practiced in the Russian Federation. It is evident that future owners are the main interested party in the ensuring of appropriate quality of apartments and building being built. For that purpose it will be necessary to make a separate section in the The Law "On management of multi-apartment buildings," which will provide legal basis for establishment and operation of such an association. The latter will be temporary and will cease its operations once the management body is set up.

It is also important to elaborate guides for developers and buyers of apartments which can help them in the different phases of property development process.

Licensing in the field of urban development is regulated by the Law "On licensing" and sets up the following types of activities for licensing:

1. elaboration of urban development documentation
2. design audit
3. construction implementation
4. construction quality technical supervision
5. engineering surveys
6. investigation of technical condition of buildings and structures.

The Ministry of Urban Development is authorized state entity which issues licenses in the field of urban development. There are two types of licenses: licenses given by complex procedure and by simple procedure. Licenses of urban development are considered as ones

given by complex procedure. For that purpose the Ministry set up commission which considers and issues or denies licenses. The licenses are given without time limits. The activity of licenses can be suspended and stopped. In 2009 the government has adopted several decrees which regulate the orders for licensing of different activities in the field of urban development.

Essential steps for design and construction

Below is given the essential steps for design and construction works. It is critical to know all fees, charges and payments for services related to design and construction works in advance. Some of fees are established by the Law of the RoA "On local duties and fees". The law sets up maximum amounts for the fees and duties. Community authorities are to set up exact amounts of them. It is also critical to know or estimate the time for each step for design and construction works. Decisions provide with some essential time limits. For increasing the quality of design audit it is necessary to introduce testing exam system for specialists of those organizations. Another possible option could be the increase of the number of required specialists and/or the duration of appropriate continual working experience.

Essential steps for design and construction

Designing and construction steps	Cost, AMD	Duration
Preliminary permission by community head	Not defined (N/D)	Maximum 20 days
Design preparation	2-9% of the building rough cost estimate	Contingent upon object
Design audit	10 percent of the design cost	Minimum 10 working days
Design confirmation by community head	N/D	10 days
Construction permit	Around 70,000 (for Yerevan >5 times more)	14 days
Quality technical inspection	2% of construction cost	Throughout of the project
Author inspection	~0.5% of construction cost	Throughout of the project
Construction completion act	According to the decision of Council of Elders of community administration	5 days 3 days in case of second application

ANNEX D: LETTERS OF CO-FINANCING



**ՀԱՅԱՍՏԱՆԻ ՀԱՆՐԱՊԵՏՈՒԹՅԱՆ ՔԱՂԱՔԱՇԻՆՈՒԹՅԱՆ ՆԱԽԱՐԱՐՈՒԹՅՈՒՆ
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0010, ք. Երևան, Տանրապետության հրապարակ
Կառավարական պոստ 3
Տեղ.՝ 589080 Գաղս՝ 523200
www.mud.am
E-mail: info@mud.am

27.01.19, 01/13/167-10
N _____

To: Ms. Gercheva
UNDP Resident Representative
UN Resident Coordinator

Dear Ms. Gercheva,

The Ministry of Urban Development of the Republic of Armenia confirms its intention to participate in the implementation of “Improving Energy Efficiency in Buildings” PIMS: 4245 Project financed by GEF with UNDP as the executing agency.

The project aims at promoting energy efficient technologies and practices in Armenian building sector with focus on construction of new and restoration of existing residential buildings with improved energy saving characteristics. Therefore, the project will contribute to introduction of energy efficiency approach and technologies in construction sector and to improvement of corresponding legislative and regulatory framework in Armenia.

The project is fully in line with the strategic priority of the Government of the Republic of Armenia to increase the efficiency of fossil fuel use and thus ensure long-term economic and environmental stability of the country.

The Ministry of Urban Development of the Republic of Armenia is authorized to implement the Housing Program in the settlements of earthquake zone and is committed to contribute 2,000,000 USD in cash and 200,000 USD in kind as co-financing to the “Improving Energy Efficiency in Buildings” project.

We look forward to our continuous successful collaboration with UNDP.

Sincerely,

Vardan Vardanyan



25 January 2010
L23/2010

Dear GEF Council Members and Secretariat,

Subject: Letter of co-financing for "Improving Energy Efficiency in Buildings" PMIS 4245 Full-Sized Project

We are pleased to confirm the commitment of UNDP Armenia CO to successful implementation of "Improving Energy Efficiency in Buildings" PMIS 4245 Full-Sized Project. The amount of co-financing for the implementation of the project allocated from UNDP Armenia TRAC resources is USD 150,000 throughout the project implementation period of 5 years.

Look forward to our cooperation on this important initiative.

Yours sincerely,



Dafina Gercheva
UN Resident Coordinator
UNDP Resident Representative

GEF Council Members and Secretariat

ANNEX E: CO₂ EMISSION SAVINGS CALCULATION

This Annex calculates the CO₂ emission reductions⁹ associated with the implementation of the present GEF project based on the GEF Manual for Calculating GHG Benefits of GEF Projects: Energy Efficiency and Renewable Energy Projects. The annex sets out the methodology and explains key assumptions for calculation of the *project direct* and *indirect* CO₂ emission reductions.

Project direct emission reductions

The project will support investments into construction of one energy efficient building (a residential building in the “Mush-2” district in Gyumri city, under the state supported restoration program) following IBDA principles. As a result of these activities, direct emission reductions totaling **1,209 tons** of CO₂eq will be achieved over 20 years of the building useful lifetime. The estimate is calculated based on the following formula and assumptions:

$CO_2 \text{ direct} = E * L * C$; where

- C – CO₂ emission factor, i.e. 0.303 tCO₂eq/MWh (calculated based on IPCC default CO₂ emission factor for natural gas and the electrical grid emission factor weighted average (Table H-1)).
- L – average useful lifetime of new building, 20 years; and
- E – annual energy saving, i.e. the difference between baseline energy consumption for heating per square meter in a typical residential building (160 kWh/m²/year) and the targeted level (65 kWh/m²/year) multiplied by the area of pilot building (2,100 m²).

Table E-1: CO₂ emission factors for building heating energy mix

Energy Source	Emission factor, tCO ₂ eq/MWh	Share in energy mix, %	Source
Natural gas	0.202	70%	IPCC
Electrical grid	0.457	30%	EF from approved CDM projects

Note: due to very high level of gasification in Armenia, we took the approach and considered that most of heating energy is based on sources burning natural gas and it will constitute 70%, the rest 30% will use electrical energy for heating purposes. Keeping in mind the 85% of average efficiency for the gas fired heaters; the weighted average of the emission factor will be 0.303 tCO₂eq/MWh

Table E-2: Direct project emission reductions

Demo site area, m ²	Baseline energy use, MWh/m ² /y	GEF alternative energy use, MWh/m ² /y	Annual energy saving, MWh	CO ₂ emission factor, tCO ₂ eq/MWh	Annual direct emission reductions, tCO ₂ eq/y	Total project direct emission reductions, tCO ₂ eq
a	b	c	d=a*(b-c)	e	f=d*e	g=f*20
2,100	0.16	0.065	199.5	0.303	60.4	1209

Note: in the BAU the full compliance with the sanitary norms was assumed (SNiP II-3-1979)

Direct post-project emission reductions

The project does not include activities that would result in direct post-project greenhouse gas emission reductions.

⁹ The only greenhouse gas associated with energy services covered by the GEF project is carbon dioxide.

Indirect emission reductions (bottom-up)

Using the GEF *bottom-up* methodology, indirect emission reductions attributable to the project are estimated at **405 ktCO₂eq** calculated over 20 years of useful lifetime of the investments. The GEF bottom-up approach implies the replication of the project methodology and investments to other residential buildings in Armenia and is calculated per following formula:

$CO_2 \text{ indirect BU} = CO_2 \text{ direct} * RF$, where

- $CO_2 \text{ direct}$ – direct emission reductions calculated at the previous step
- RF – replication factor

The direct CO₂ emission reductions were estimated in the previous section at 1,209 tCO₂eq. The replication factor was arrived at using the following assumption: it is planned to build around 460,000 m² of similar housing by the state supported program, but replication will impact only about 40% (200,000m² or 95 similar buildings) of the projected construction after GEF project completion using the methodology applied by this project in the demo buildings. For the rest of the country it is assumed that about 240 new buildings (10% of the projected construction in the residential segment) are going to be built over 10 years after GEF project completion using the methodology applied by this project in the demo buildings. The residential construction growth rate was assumed around 2-6% and is based on the projected GDP growth (Second National Communication on Climate Change to the UNFCCC); thus applying to the following formula:

$$CO_2 \text{ indirect} = 1209 * (95+240) = \mathbf{405,015} \text{ tCO}_2\text{eq.}$$

Indirect emission reductions (top-down)

Using the GEF *top-down methodology*, indirect emission reductions attributable to the project have been estimated at around **1.35 MtCO₂eq** over 20 years of useful lifetime of the buildings.

The GEF top-down assesses indirect GHG impacts by estimating the combined market potential for the proposed approach or technology within the 10 years after the project lifetime and is calculated per following formula:

$CO_2 \text{ indirect TD} = P10 * CF$, where

- P10 = technical and economic potential for GHG savings with the respective application within 10 years after the project;
- CF = GEF causality factor.

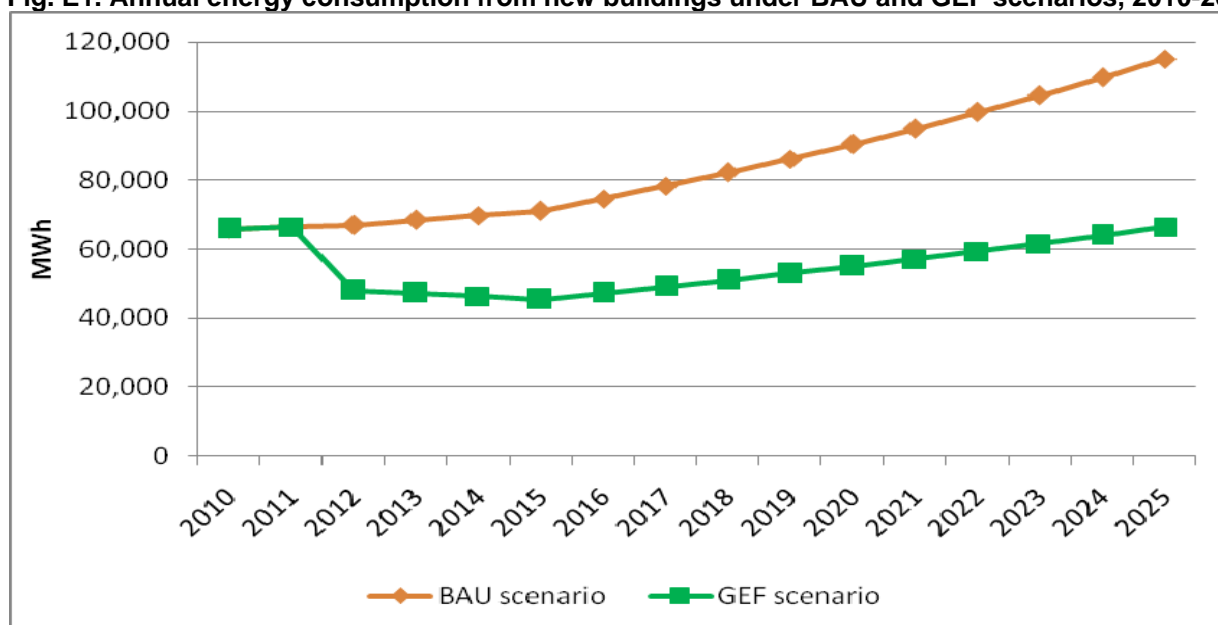
The market potential for energy savings and GHG emission reductions has been estimated based on the forecast of Armenian building stock dynamics and the following key assumptions. With the GEF support the current building codes and regulations will be enhanced resulting in a 40% reduction of average energy requirement for heating from the current level of 160 kWh/m²/year to 96 kWh/m²/year by 2012. The more stringent code requirements are expected to initially bring code compliance down to 30% full compliance, 40% minor non-compliance, 30% major non-compliance by 2012. However, the project-supported capacity building and technical assistance will contribute to subsequent improvements in compliance to 75% full compliance, 10% minor non-compliance, 15% major non-compliance by 2015.

Application of an integrated building design approach in new buildings has been estimated to enable an average of 50% reduction in energy requirement for heating from the current 160 kWh/m²/year to 80 kWh/m²/year. Moderate penetration rates have been assumed for IBDA

adoption by the different segments: *residential* sector - starting from 1% of annual construction in 2012, gradually increasing to 4% in 2015 and to 14% by 2025; *non-residential* sector - starting from 2% of annual construction in 2012, gradually increasing to 5% in 2015 and up to 15% by 2025.

The annual energy consumption in the new Armenian building stock to be built in 2010-2025, with the business-as-usual compared with the GEF project scenario, is presented in the figure H1 below. The combined impacts of the project-supported interventions and ensuing replications within 10 years of GEF project influence period (2016-2025) are estimated to enable cumulative energy savings in the Armenian building sector to the tune of 7,441 GWh (calculated over 20 years of useful lifetime of the buildings constructed over the influence period), calculated as the sum of differences in projected annual energy use of new buildings in the BAU and GEF scenarios over 2016-2025 multiplied by 20 years, i.e. $372.069 \text{ GWh} * 20 = 7,441 \text{ GWh}$.

Fig. E1. Annual energy consumption from new buildings under BAU and GEF scenarios, 2010-2025

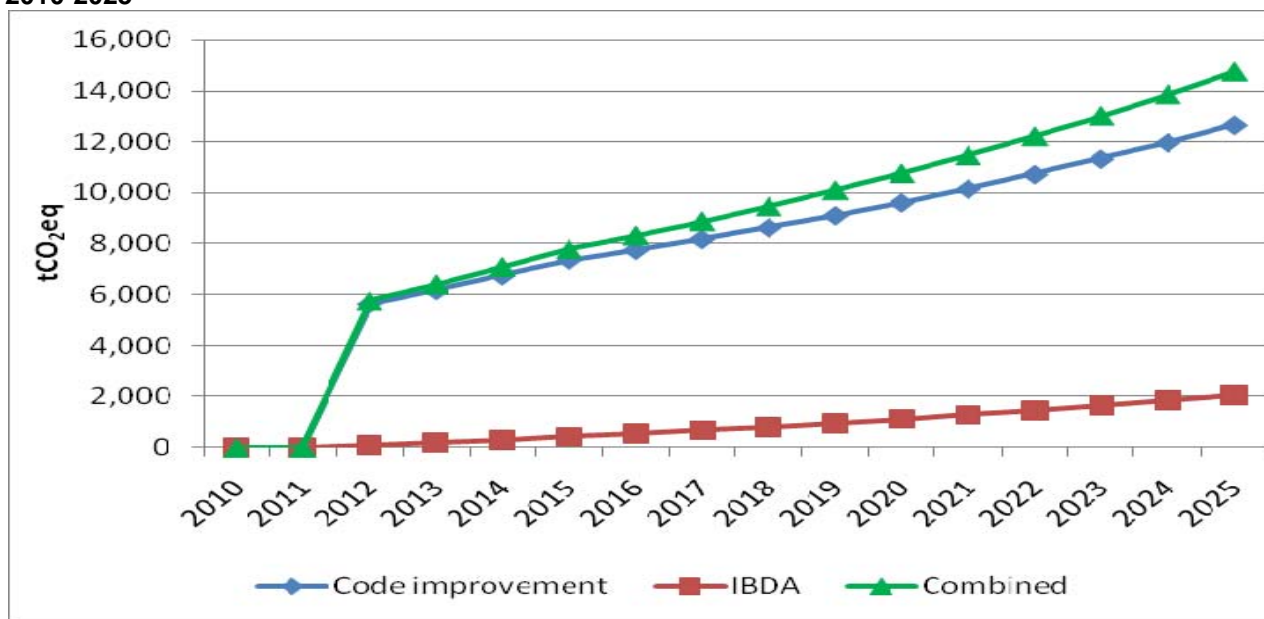


Thus, the resulting GEF alternative GHG emissions scenario shows considerable deviation below the baseline (see figures H2) and is estimated at around 1.35 million tons CO₂eq of cumulative emission reductions (over 20 years of buildings lifetime), assuming CO₂eq emission factor of 0.303 tCO₂eq/MWh and GEF causality factor of 60%:

$$7,414,377 \text{ MWh} * 0.303 \text{ tCO}_2\text{eq/MWh} * 0.6 = \mathbf{1,352,842 \text{ tons CO}_2\text{eq}}$$

For the GEF causality factor 3 (60% - the GEF contribution is substantial, but modest indirect emission reductions can be attributed to the baseline), the estimate incorporates exogenous improvements due to other possible stakeholder activities (e.g. the World Bank project focusing on institutional buildings), and some degree of improvements in energy efficiency in buildings which has already been taken into account when constructing the baseline for Armenian building stock and business-as-usual policy developments (e.g. annual 1% improvement in code requirements etc.).

Fig. E2. Forecast annual GHG emission reductions from new buildings by GEF project components 2010-2025



Total emission reductions

Direct Emission Reductions: the project investment in one demonstration building (residential building) during the project’s implementation phase will result in direct greenhouse gas emission reductions. As a result of these activities during the project implementation period of four years, direct greenhouse gas emission reductions totaling **1,209 tCO₂eq** will be achieved over 20 years of useful lifetime of the building. In the non-GEF case, these energy needs would be satisfied by heating energy generation capacity with an emission factor of **0.303 tCO₂/MWh**. The project does not foresee any activities that would result in direct post-project GHG emissions.

Indirect Emissions Reductions: Using the GEF bottom-up methodology, indirect emission reductions attributable to the project have been estimated at **405 ktCO₂eq** over 20 years of useful lifetime of the buildings. Using the GEF top-down methodology, indirect emission reductions from new buildings constructions over the GEF influence period (2016-2025) attributable to the project are estimated at **1.35 MtCO₂eq** calculated over 20 years of useful lifetime of the buildings. The difference between top-down and bottom-up approaches can be explained by the fact that the bottom-up estimate includes only residential buildings, whereas the top-down estimates looks at the entire new building stock (to be built over 2016-2025) and inherently reflects impacts from better code compliance, material certification etc.

ANNEX F: PROJECT ENDORSEMENT AND LPAC MINUTES



Monique Barbut
Chief Executive Officer
and Chairperson

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Fax: 202.522.3240/3245
E-mail: mbarbut@TheGEF.org

May 7, 2010

Mr. Yannick Glemarec
GEF Executive Coordinator
United Nations Development Programme
One United Nations Plaza
304 East 45th St.
FF Bldg., 10th floor
New York, NY 10017

Dear Mr. Glemarec:

I am pleased to inform you that I am endorsing the project proposal entitled **Armenia: LGGE Improving Energy Efficiency in Buildings under the Global: LGGE Framework for Promoting Low Greenhouse Gas Emission Buildings**, for \$1,045,000 in financing from the GEF Trust Fund (GEETF). I understand that this project proposal will be submitted for approval in accordance with the UNDP procedures. I note that a project preparation grant (PPG) of \$45,450 was previously approved for preparation of this project and that a report on the use of those funds has been submitted to the Secretariat. Taking into account the PPG, the entire GEF grant for the project is \$1,090,450.

I am also endorsing the fee of \$104,500 for project cycle management services.

I am endorsing this project on the understanding that the project will meet the following milestones:

- (i) The GEF Agency approval will be signed no later than June 2010;
- (ii) A report on the status of the project at mid-term will be submitted to the Secretariat no later than November 2012; and
- (iii) The closing date of the project grant will be no later than July 2015 and a terminal evaluation/project completion report will be submitted to the Secretariat within 6 months of such closing date.

You are requested to ensure that the GEF Secretariat is informed when each of these milestones has been met. If any milestone is not or will not be achieved, you are requested to

inform me as early as possible. After consultations with your Agency, I may agree to revised milestones or recommend to your Agency the cancellation or suspension of the project, and I will communicate to the beneficiary country and your Agency the basis for such a recommendation.

Please ensure that your grant agreements continue to fully reflect this understanding.

I am attaching a copy of the project tracking sheet and review sheet for your records.

Sincerely,



Monique Barbut
Chief Executive Officer and Chairperson

Attachment: Project Document

Copy to: Country Operational Focal Point
GEF Agencies, STAP, Trustee

MINUTES
OF LOCAL PROGRAMME ADVISORY COMMITTEE
“Improving the Energy Efficiency in Buildings” UNDP/GEF/00059937 Full-Size Project
UN House

18 May 2010, 11:00 - 12:00

LPAC Members:

Dirk Boberg	UNDP Deputy Resident Representative
Simon Papyan	First Deputy Minister of Nature Protection of RA, UNDP EG Programmes National Director
Aram Gabrielyan	Head of the Environmental Protection Department, Ministry of Nature Protection of RA, UNFCCC Focal Point
Anahit Simonyan	Head of UNIDO Operations in Armenia
Evgenia Atayan	Head of Housing Provision, Residential Stock Management and Communal Policy Department, Ministry of Urban Development RA
Samvel Srapyan	Head of the Communal Policy Division, Ministry of Urban Development RA
Ashot Harutyunyan	Head of the Economics Department, Ministry of Nature Protection of RA
Hayk Badalyan	Leading Specialist, EE and Technical Normative Division, Ministry of Energy and Natural Resources RA
Artashes Petrosyan	Deputy Chair of the HVAC, Yerevan State University of Architecture and Construction
Gevorg Nazaryan	Head of Staff, “National Institute of Standards” CJSC
Gurgen Minasyan	Executive Director, Builders' Union of Armenia
Alexander Vardanyan	Member, Builders' Union of Armenia
Armen Martirosyan	UNDP CO, Environmental Governance Portfolio Analyst
Diana Harutyunyan	UNDP CO, Climate Change Program Coordinator

Purpose:

Presentation of “Improving the Energy Efficiency in Buildings” UNDP/GEF Full-Size Project, discussion of main outcomes, implementation arrangements and provision of recommendations.

Documents presented:

- Full-size Project Document (Armenian and English)
- Project brief document (Armenian),
- Presentation

Reporting

Welcome remarks were delivered by Mr. Dirk Boberg, UNDP Deputy Resident Representative and Mr. Simon Papyan, First Deputy Minister of Nature Protection of RA

Ms. Diana Harutyunyan presented the project's preparation process, planned outcomes and outputs, global environmental benefits and implementation arrangements. The PIF document was submitted in March 2009 and resubmitted in April 2009. PPG document was endorsed by GEF CEO in May 2009, and the FSP was prepared during June 2009 to April 2010. The FSP draft document was reviewed by UNDP (Bratislava regional and NY offices). The GEF CEO approved the FSP document on May 7, 2010.

Furthermore, expected project outcomes and outputs were presented in details to LPAC members. Major principles and approaches, as well as project implementation scheme/institutional structure were also presented. During the presentation, particular attention was paid to developing monitoring and evaluation plan for the project, as well as importance of long-term sustainability and ensuring

replicability of the project activities and subsequent outcomes. Relevance of the project to the country, GEF and UNFCCC priorities was also presented.

Questions

Mr. G.Minasyan inquired on the types of insulation materials considered in the PPG phase.

Mr. V.Jalalyan clarified that almost all types of locally produced and imported insulation materials were considered although in most cases there was no certificate of thermal resistance indicators.

Ms. A.Simonyan asked if the project is going to address the building normative enforcement in general.

Ms. D.Harutyunyan noted in response, that regulatory framework in construction sector is in clear need of improvement. Although there is a regulatory provision to revise building codes once every 5 years, revisions are not performed due to their costliness and complexity. Besides, the RA Ministry of Justice is reluctant of approving technical documents imposing mandatory behavior as these can be adopted by a sector authorized body. However, as the RA has joined the (voted for) Intergovernmental Building Code on energy performance of buildings (MSN), which is related to the energy issues in building design, construction control etc, this standard may serve as promoter for other norms. Urban development sector is in clear need of international support, which can be accessible in the framework of European Neighborhood programme as buildings are considered the main energy consumers.

Ms. E.Atayan raised question on organizational part of project document signing procedure.

Mr. A.Martirosyan briefly introduced the process of GEF projects' endorsement/approval.

Ms. A.Simonyan further asked if technology transfer and local manufactory promotion is envisaged within the project and if the capacity of local testing laboratories will be enhanced.

Ms. D.Harutyunyan replied positively, in particular mentioned that various building envelope types would be studied such as "sandwich" panel constructions, windows, etc. There is no mandatory certification yet; however, as the market will be saturated, e.g. windows, voluntary certification can become attractive as an advertisement and product promotion tool. Locally produced materials can be promoted within the project in case they will be certified. Besides, laboratories will be basically equipped and trained to enable them testing heat transfer characteristics of building materials.

Mr. S.Papayan asked how EE measures are implementation will impact on the cost of construction.

Ms. D.Harutyunyan replied that usually that value can range from 0 to 10 percent according to international experience.

Mr. V.Jalalyan further clarified that the use of light construction blocks with improved thermal characteristics can provide additional benefits e.g. by lighting the construction thus contributing to seismic features of the building and presented their financial advantages.

Comments

Mr. A.Nazaryan proposed that the project have to address enhancement of developers' and constructors' qualification, as well as assist in establishing the system of quality management via establishing new and improving the existing laboratories. According to him, it is highly desirable to encourage EE elements in tender announcements and procurement.

Mr. H.Badalyan noted that none of construction materials (insulation) is certified and informed that the RA Law "On Renewable Energy and Energy Saving" was reviewed and amendments were done, in particular on EE labeling, and recently the amended document was submitted to the RA Government.

Ms. E.Atayan congratulated the participants and expressed hope that in the framework of the project pilot component the multi apartment building management scheme will be tested as well; building passport will be developed for the demo building. She mentioned that construction sector normative documents obviously need revision and that is planned under EU NNP and huge work has to be done in that aspect.

Mr. A.Gabrielyan joined the proposition of Ms. E. Atayan and his opinion is that the project could also address the issue of energy saving in existing buildings. This necessitates referring to the issue of multi-apartment building management again. Without proper solution to this issue speaking of energy saving measures' implementation goes in vain. Mr. A. Gabrielyan also provided comment that Republic of Armenia stated its position in Copenhagen Accord on GHG mitigation including measures in building sector. The international cooperation, in addition to national funding, would be financially supported via Copenhagen Green Fund. Consequently, within the project planning and

implementation process, it is necessary to closely follow new developments under UNFCCC and, as negotiations are currently on-going, to ensure proper flexibility for the project so that the project could proceed in line with the mentioned developments.

Mr. D.Boberg brought an example of Germany as a country, where EE is very high on agenda of Government and on mind on every citizen. According to him, high energy tariffs could force Armenian citizens thinking of energy saving, while UNDP could support elaboration of relevant norms and standards and thus securing the policy aimed at CO2 emissions reduction.

Mr. S.Papayan acknowledged importance of the project as some gaps in the sector could be addressed within the project's implementation. In that respect special emphasis must be considered in the project components 1 and 2. According to him, elaboration/improvement and adoption of urban development norms is a complex process, but its difficulties may be mitigated via proper effort coordination and close cooperation between responsible agencies and stakeholders. He also mentioned the importance of project performance indicators' being realistic and well-substantiated.

Recommendations

Based on the result of discussions and positive feedback from the project partners and stakeholders, considering the importance of the project outcomes for the national policy making process, recognizing its timeliness and consistency with national and global development goals, LPAC recommended FSP document for further approval by GEF Implementing Agency and National Implementing Partner.



Dirk Boberg
UNDP Deputy Resident Representative
LPAC Chair

IX. SIGNATURE PAGE

Country: Republic of Armenia

UNDAF Outcome:	4. Environment and disaster risk management is integrated into national and local development plans
Indicator (s):	Environmental Performance Index (EPI); % increase in state budget allocation for environment protection
CPAP Outcome:	4.1 Armenia is better able to address key environmental challenges, including climate change and natural resource management
Indicator (s):	Environmental Performance Index (EPI)
CPAP Output (s):	4.1.4 National and local capacities to develop innovative policies and practices to address climate change mitigation and adaptation strengthened.
	4.1.5 Innovative policies and practices for environmentally sound, energy efficient technologies and cleaner production developed and implemented
Indicator (s):	No of sub legislative acts adopted to promote energy efficiency in buildings No. of initiatives promoting energy efficiency developed and implemented.

Executing Entity/Implementing Partner: Ministry of Nature Protection
Implementing entity/Responsible Partner: Ministry of Nature Protection, Ministry of Urban Development

Programme Period:	2010 – 2015	Total resources required	US\$ 3,395,000
Atlas Award ID:	00059937	Total allocated resources:	US\$ 3,395,000
Project ID:	00075196	○ GEF	US\$ 1,045,000
PIMS #	4245	○ Government	US\$ 2,000,000
Start date:	July 2010	○ Government In-kind	US\$ 200,000
End Date	July 2015	○ UNDP	US\$ 150,000
Management Arrangements	NIM		
PAC Meeting Date	18 May 2010		

Agreed by (Government – Executing Agency):

Aram Harutyunyan

**Minister of Nature Protection
Republic of Armenia**

Date/Month/Year

Agreed by (UNDP - Implementing Partner):

Dafina Gercheva

**Resident Representative
UNDP Armenia**

Date/Month/Year