Republic of Armenia

United Nations Development Programme

Project Document for nationally implemented projects financed by the Green Climate Fund (GCF)

Project Title: De-Risking and Scaling-up Investment in Energy Efficient Building Retrofits	
Country: Armenia	
Implementing Partner: Ministry of Nature Protection of Republic of Armenia	**Management Arrangements:** National Implementation Modality (NIM)
UNDAF Outcome 7/Country Programme Outcome(s) 4 (13): By 2020, sustainable development principles and good practices for environmental sustainability resilience building, climate change adaptation and mitigation and green economy are introduced and applied. **Expected CPAP Output:** 4.4 Low carbon and green economy become priority for the Government, supported by relevant regulatory framework and activities.	
UNDP Strategic Plan Output: 1.5: Inclusive and sustainable solutions adopted to achieve increased energy efficiency and universal modern energy access (especially off-grid sources of renewable energy)	
	UNDP Gender Marker for each project output:
	Output 1: gender marker rating = 2
	Output 2: gender marker rating = 2
	Output 3: gender marker rating = 2
	Output 4: gender marker rating = 2
Atlas Project ID number: 00098348	**Atlas Output ID number: 00101711**
UNDP-GEF PIMS ID number: 5684	**GCF ID number: FP010**
Planned start date: July 2017 **GCF Effectiveness Date:** 30 June 2017	**Planned end date:** June 2023
LPAC date: The project was approved by UNDP Local Project Appraisal Committee (LPAC) on 27 July 2015 and approved in its final form on 30 June 2017.	
Brief project description: Using an integrated suite of de-risking interventions, the Project seeks to systematically de-carbonise the existing building stock in Armenia to reduce greenhouse gas (GHG) emissions while achieving sustainable development benefits. The Project, addressing both public and residential buildings, focuses on creating a favourable market environment and a scalable business model for investment in energy efficiency retrofits by addressing market barriers. These barriers to energy efficient building renovation are addressed through a combination of policy and financial de-risking instruments and targeted financial incentives to key market players. To address each specific risk area, the Project is structured under four components: (i) building sector monitoring, reporting and verification (MRV) and knowledge management, (ii) policy de-risking, (iii) financial de-risking, and (iv) financial incentives. By systematically targeting barriers,	

the Project will significantly reduce the investment risk profile of energy efficiency building retrofits to encourage private sector investment and thereby scale-up investment in energy efficiency building retrofits in Armenia.

The Project will lead to sizeable energy savings and accompanying GHG emissions reductions (between 5.1 and 5.4 million tCO_2 over the 20-year lifetime of the investments), green job creation and poverty reduction. In addition to funding from the Green Climate Fund, the Project will catalyse private and public sector financing of approximately US$ 110 million. The Project will ensure gender equality through enabling inclusive mechanisms for women's and men's equal participation in design, implementation, monitoring and evaluation, considering their diverse experiences for assessments and decision-making, and enabling non-discriminatory access to resources and capacity development.

FINANCING PLAN	
GCF grant	USD 20,000,000
UNDP TRAC resources (cash)	USD 420,000
UNDP parallel funding	USD 1,000,000
(1) Total Budget administered by UNDP	**USD 21,420,000**
PARALLEL CO-FINANCING (*all other co-financing (cash and in-kind)*	
Yerevan Municipality (cash funding)	USD 8,000,000
Government (in kind)	USD 400,000
European Investment Bank (EIB)	USD 86,250,000
(2) Total co-financing	**USD 94,650,000**
(3) Grand-Total Project Financing (1)+(2)	**USD 116,070,000**

SIGNATURES		
Signature: Artsvik Minasyan, Minister, Ministry of Nature Protection of the Republic of Armenia	**Agreed by the Government**	**Date/Month/Year:** 07/07/2017
Signature: Artsvik Minasyan, Minister, Ministry of Nature Protection of the Republic of Armenia	**Agreed by the Implementing Partner**	**Date/Month/Year:** 07/07/2017
Signature: Bradley Busetto, UN Resident Coordinator, UNDP Resident Representative	**Agreed by UNDP**	**Date/Month/Year:** 07/07/2017

Disbursement:
Annex 1 forms an integral part of this Project Document and to this end the Government hereby acknowledges that it has read and agrees to be bound, mutatis mutandis, by the obligations and agreements set forth in the [FAA] to the extent that they relate to actions of the Government, including, but not limited to, those set forth in Clauses 8 and 9.02 of the FAA. For the avoidance of doubt, the Government shall ensure that all conditions that relate to its actions are met and there is continuing compliance, and understands that availability of GCF funding is contingent on meeting such requirements and such compliance.

Contents

List of tables

List of figures

List of acronyms

ACBA	Agricultural Cooperative Bank of Armenia
ACP	Advisory Committee on Procurement
ADB	Asian Development Bank
AMA	Accreditation Master Agreement
APR	Annual Project Report
AWP	Annual Work Plan
BPPS	UNDP Bureau for Policy and Programme Support
CAP	Contracts, Asset and Procurement Committee
CDM	Clean Development Mechanism
CEDAW	UN Convention on the Elimination of All forms of Discrimination against Women
CIS	Commonwealth of Independent States
CPAP	Country Programme Action Plan
CWA	Council on Women's Affairs
DFI	Development Finance Institutions
DHW	Domestic hot water
EBRD	European Bank for Reconstruction and Development
EE	Energy efficient / Energy efficiency
EECA	Eastern Europe and Central Asia
EIB	European Investment Bank
EMIS	Energy Management Information System
ENP	European Neighbourhood Policy
EPBD	(EU Directive on) Energy Performance in Buildings
EPC	Energy Performance Contracting
EPIU SI	Environmental Project Implementation Unit State Institution
ERC	Evaluation Resource Centre
ESCO	Energy Service Company
ESRE	(Law on) Energy Saving and Renewable Energy
EU	European Union
FAA	Funded Activity Agreement
FI	Financial Institution
FIE	Final Independent Evaluation
GBV	Gender-based violence
GCF	Green Climate Fund
GDI	Gender Development Index
GEF	Global Environment Facility
GGGI	Global Gender Gap Index
GHG	Greenhouse Gas
GII	Gender Inequality Index
GoA	Government of Armenia
HACT	Harmonized approach to cash transfer
HOA	Home Owners' Association
HMC	Housing Management Company
IFC	International Finance Corporation
IFI	International Financial Institution
IGES	Institute for Global Environmental Strategies
IIE	Interim Independent Evaluation
INDC	Intended Nationally Determined Contribution
IRRF	Integrated Results and Resources Framework
ISO	International Organisation for Standardisation
ITAP	Independent Technical Advisory Panel (of the GCF)
M&E	Monitoring and Evaluation
MoNP	Ministry of Nature Protection of Republic of Armenia
MoV	Means of verification
MRV	Monitoring, reporting and verification
MWh	Megawatt-hour
NAMA	Nationally Appropriate Mitigation Action

NDA	National Designated Authority
NEEAP	National Energy Efficiency Action Plan
NGO	Non-governmental organisation
NIM	National Implementation Modality
NPESRE	National Program on Energy Saving and Renewable Energy
OECD	Organisation for Economic Cooperation and Development
O&M	Operation and Maintenance
PIR	Project Implementation Review
PM	Project Manager
PMT	Project Management Team
PPP	Public-private partnership
PPR	Project Progress Report
QPR	Quarterly Progress Report
RA	Republic of Armenia
RACP	Regional Advisory Committee on Procurement
RCU	Regional Coordination Unit
REELIH	Residential Energy Efficiency for Low Income Households (Project)
RISE	Readiness for Investment in Sustainable Energy
R2E2 Fund	Renewable Resources and Energy Efficiency Fund of Armenia
SEAP	Sustainable Energy Action Plan
SBAA	Standard Basic Assistance Agreement
SCCF	Special Climate Change Fund
SECU	Social and Environmental Compliance Unit of UNDP
SESP	Social and environmental screening procedure
SME	Small and medium-sized enterprise
TL	Team Leader
TNA	Technology Needs Assessment
TOR	Terms of Reference
TR	Technical Regulation
UNDAF	United Nations Development Assistance Framework
UNDP	United Nations Development Programme
UNDP CO	UNDP Country Office
UNECE	United Nations Economic Commission for Europe
UNFCCC	United Nations Framework Convention on Climate Change
USAID	United States Agency for International Development
USD	United States Dollar
VAT	Value-Added Tax
WB	World Bank

EXECUTIVE SUMMARY

The *De-risking and Scaling-up Investment in Energy Efficiency Building Retrofits*' Project seeks to systematically de-carbonise the existing building stock in Armenia to reduce greenhouse gas (GHG) emissions while achieving sustainable development benefits. To do so, the Project focuses on reducing the overall investment risk profile of energy efficiency retrofits in the building sector – one of the major energy consumers in Armenia. Creating a favourable market environment and scalable business model for investment in energy efficiency retrofits will lead to sizeable energy savings, GHG emissions reductions, green job creation and poverty reduction.

The Project addresses market barriers to energy efficient building renovation via a combination of policy and financial de-risking instruments and targeted financial incentives to key market players. By targeting policy, financial, market, technical and capacity barriers, the Project will significantly reduce the overall investment risk profile of energy efficiency building retrofits to encourage private sector investment and thereby scale-up investment in energy efficiency building retrofits in the country. The Project's four components each addressing a specific risk area: (i) building sector monitoring, report and verification (MRV) and knowledge management; (ii) policy de-risking; (iii) financial de-risking; and (iv) financial incentives.

First, the Project will support the development of a building sector MRV framework, including guidelines and methodologies building on UNDP's experience with establishing Energy Management Information Systems (EMIS). The Project will also support the knowledge and collective learning processes in Armenia through promoting better information dissemination to stakeholders and sharing lessons learned.

Policy de-risking, under the second component, will support national, sub-national and local authorities to adopt and implement an enabling policy framework for energy efficiency retrofits. Investment risks for commercial lenders of energy efficiency retrofit finance will be addressed through policy de-risking tools including:

- modernisation and enforcement of energy efficiency standards and mandatory energy performance standards for retrofitted buildings;
- monitoring and enforcement of associated construction norms and standards;
- development, introduction and enforcement of adequate secondary legislation for providing functional models and rules for all multi-apartment building management bodies to undertake energy efficiency retrofits;
- improvement and implementation of legislation that will assist the management of energy efficiency building retrofits for different types of buildings;
- assistance to residents and common-share building organisations on collective decision-making on the complex issues of energy efficiency retrofit investment.

The Project will also provide technical assistance to selected market players such as building owners, managers, owner associations and local government to identify, develop and aggregate technically and financially feasible energy efficiency retrofit projects.

The financial de-risking component – in partnership with the European Investment Bank (EIB), the R2E2 fund, local banks and other relevant national and international financial institutions – will provide access to affordable capital for energy efficiency retrofits. De-risking instruments will take several forms, including credit lines from financial institutions and/or loan guarantees to stimulate local commercial banks to lend to private ESCOs and/or building owners. Technical assistance will be offered to local commercial banks to develop their products, appraise investments and develop a pipeline of projects. Information on the availability of energy efficiency building retrofit finance packages will be disseminated.

Targeted financial incentives, through component 4, will be provided and offered to building/apartment owners, or the ESCOs serving these clients, to ensure that the most vulnerable households can afford the costs of energy efficiency retrofits. Due to widespread poverty and inequality prevalent across urban areas in Armenia, at least one-fifth of households cannot afford to keep adequately warm at reasonable cost and are unable to afford the upfront costs of energy efficiency retrofits. Direct incentives for vulnerable groups are required to help address the affordability gap and stimulate the demand for energy efficiency retrofits. Grants will support poor and vulnerable households to allow them access to improved thermal comfort and cost / energy savings.

Overall, the Project is aligned with the GCF investment framework that emphasises upgrading existing infrastructure and supporting efforts to strengthen urban systems. The Project builds on and leverages UNDP's extensive experience supporting the Government of Armenia and successfully engaging the private sector in reducing the barriers for energy efficiency in heating, building and lighting sectors. The Project will create a favourable market environment and a scalable business model for investment in energy efficiency retrofits in Armenia, leading to GHG emissions reductions of between 5.1 and 5.4 million tCO_2 over the 20-year lifetime of the investments. In addition to funding from the GCF, the Project will catalyse private and public sector financing of approximately US$ 110 million.

The Project prioritizes gender equality and will ensure inclusive mechanisms in place for women's and men's equal participation through design, implementation, monitoring and evaluation in all four project outputs as expert or beneficiary; informing assessments and decision-making; and having non-discriminatory access to resources and capacity development. In line with the UNDP Armenia Gender Equality Strategy, the Project will apply a gender disaggregated data framework and will target participation of women of at least 30%. The Gender Marker of the Project in all outputs is GEN2, aimed at a significant contribution towards gender equality dimension.

1. DEVELOPMENT CHALLENGE

1.1. Strategic context and global significance

Greenhouse gas (GHG) emissions from the building sector have more than doubled since 1970 and now represent 19% of all global GHG emissions. The lower middle-income countries in Eastern Europe and Central Asia (EECA), including Armenia, account for almost 40% of all non-OECD GHG emissions in the buildings sector. These countries also exhibit some of the world's highest levels of per capita energy use in buildings, as well as potential for further growth considering the improvement in economic conditions on those countries, which make them good candidates for a Green Climate Fund (GCF)-supported energy efficiency retrofits acceleration project.

Globally, the building sector offers the greatest potential for abatement. Increasing the efficiency of energy use in buildings has estimated mitigation potential of 3.3 to 4 $GtCO_2e$/year. Cost-effective best practices and technologies, such as deep energy efficient retrofits, can achieve 50-70% energy savings when they are broadly applied.

The buildings sector is one of major energy consumers in Armenia. According to Armenia's 2010 National GHG Inventory in the National Communication to the UNFCCC, almost 28% of primary energy resources are consumed in buildings, mostly in the residential sector, comprising the 20% of the total GHG emissions. Armenia's Third National Communication to the UNFCCC (2015)[1] identifies public, residential and commercial buildings among the country's top priorities for climate change mitigation: GHG emissions from buildings grew fivefold between 2000 and 2010, from 345 ktCO2 in 2000 up to 1,723 ktCO2 in 2010. Armenia's UNFCCC Technology Needs Assessment[2] (2003) identifies heat supply to buildings as one of the main sources of GHG emissions and as having a large potential for energy saving and emission reduction. The Intended Nationally Determined Contribution (INDC) of Armenia[3] (2015) identifies "energy (renewable energy and energy efficiency)" and "urban development (building and construction)" among the main sectors included in the national mitigation contributions of the Republic of Armenia.

Due to Armenia's markedly continental climate with a long heating season and winter average temperatures around -5°C and an absolute minimum temperature of -42°C, energy consumption and GHG emissions in the Armenian building sector are mainly associated with space heating. The average thermal energy consumption for space heating in new residential buildings in Armenia is 185 kWh/m^2 per year with older buildings having significantly higher needs[4]. One sub-set of buildings with significant energy-savings potential in Armenia is concrete panel buildings, of which there are about 4,300. In such buildings alone, the energy-saving potential from thermal modernisation is over 1.25 TWh/year, with a GHG reduction potential of 250,000 tCO_2 per year, and annual savings of US$ 63 million (based on the gas and electricity tariffs of 2014).

Energy costs constitute a large share of annual expenses incurred by public buildings. In a survey of educational, municipal and healthcare buildings, 35% of those surveyed stated that electricity bills amount to 11-20% of their total annual spending[5]. Electricity costs were particularly high for educational buildings, where 27% of respondents reported the share of electricity costs to be above 20%. Many schools close down in winter because they cannot provide adequate space heating. When they do operate, they often maintain indoor air temperatures significantly below adequate levels.

Residential buildings and fuel poverty. Poverty levels in Armenia have increased since 2007, which is primarily a result of the energy crisis, caused by high dependence on imported energy, and hikes in prices of household energy. The households in Armenia exhibits high energy expenditures relative to income, which results in fuel poverty. About 32% of the population lives below the poverty line against the average national poverty index.[6]

[1] http://www.nature-ic.am/wp-content/uploads/2013/10/1.Armenias-TNC_2015_ENG.pdf, p. 21
[2] http://unfccc.int/ttclear/misc_/StaticFiles/gnwoerk_static/TNR_CRE/e9067c6e3b97459989b2196f12155ad5/19789a07b4de493cb72e43c47fd4db1e.pdf
[3] http://www4.unfccc.int/submissions/INDC/Published%20Documents/Armenia/1/INDC-Armenia.pdf
[4] Karner, A., 2013, Mid-term Evaluation of the UNDP-GEF project "Improving Energy Efficiency in Buildings in Armenia (EE Buildings)" PIMS 4245.
[5] Energy Consumer Survey in Armenia: Residential, Commercial, Public and Industrial Sectors. Advanced Engineering Associates International. September 2006.
[6] http://data.worldbank.org/country/armenia

The World Bank classifies Armenia as a lower middle-income country. In 2014, Gross National Income per capita was US$ 3,810, slightly above the average of other lower middle-income countries. The adverse impacts of the financial crisis, which hit the Armenian economy hard between 2008-2011, was a key factor in the marked increase in the level of poverty in the country, reaching 26.8% in 2011.[7] The Human Development Index is 0.729 (87th in global rankings).

High energy expenditures relative to income result in energy poverty. Rising fuel costs and the need for investments in new energy assets and rehabilitation of existing assets will increase the cost of providing electricity. Thus, households currently facing energy poverty are likely to continue to experience significant pressures on their budgets as energy tariffs continue to rise. On average, Armenian households spend about 8% of their budget on energy, with slightly more than half of this on gas.[8] In 2010, there was a tariff increase on gas imports from Russia which led to a nearly 40% increase in the retail gas price for residential consumers. In an analysis of the impacts of this increase, the World Bank estimates that it led to an additional 1.9% of Armenian households being classified as poor. The increase in gas price also led to an increase in the proportion of households using fuelwood for heating, which served to increase indoor air pollution. Rising fuel costs and the need for investments in new energy assets and rehabilitation of existing assets will increase the cost of providing electricity. Thus, households currently facing fuel poverty are likely to continue to experience significant pressures on their budgets as energy tariffs continue to rise.

Due to widespread poverty and inequality prevalent across urban areas in Armenia, at least one-fifth of households are not able to afford the upfront costs of energy efficiency retrofits. The project directly targets these groups through focused subsidies to help address the affordability gap and stimulate the demand for energy efficiency retrofits.

A decision on 17 June 2015 by the Public Services Regulatory Commission to raise electricity prices by 17-22% led to protests in Yerevan and other cities. The extensive unrest demonstrates the significance of fuel poverty and has raised the issue to the top of the Government's agenda.

Public buildings. Energy costs constitute a large share of annual expenses incurred by public buildings. The Government of Armenia and municipalities are fiscally constrained in terms of available budgets necessary to invest in public building energy efficiency retrofits. While some local banks provide credit lines for building energy efficiency investments, there is an overall lack of depth and history in the local capital market for finance products in energy efficiency building retrofit finance for the range of potential stakeholders, including single-dwelling residential, multi-owner apartments and public buildings.

Armenia's Third National Communication to the UNFCCC (2015)[9] provides an up-to-date overview of policies and measures for mitigation of GHG emissions in the country. It identifies public, residential and commercial buildings among the country's top priorities for climate change mitigation.

Improving energy efficiency in the building sector has been assigned a high priority in Armenia's climate, energy and housing strategies. In particular, achieving thermal modernization through energy efficiency retrofits is outlined as a national development priority, particularly for multi-apartment buildings. This is particularly clear in the provisions of the National Energy Efficiency Programme (2007), the National Security Strategy (2007), the Concept for Ensuring Energy Security (2013) and the Energy Security Strategy Action Plan (2014), which all identify the energy efficiency potential for the buildings sector and provide outlines of technical measures / solutions to be taken. In addition, the Covenant of Mayors (a 11-city joint agreement) outlines building energy efficiency goals. Recently UNDP supported the Yerevan Municipality in developing the sustainable Energy Action Plan, which was approved by the City Council on 14 of June 2016 and the building sector is addressed. Since 2004, Armenia has been involved in the European Neighbourhood Policy (ENP). The ENP Action Plan was approved in 2006 and is supporting the harmonisation of Armenian legislation, norms and standards with EU energy efficiency criteria.

Policy dimension. The general legal-regulatory framework governing energy efficiency in buildings in Armenia was reviewed in 2013 in the report, 'Results of Analysis and Recommendations for

[7] ibid

[8] World Bank (2012). *Poverty and Distribution Impact of Gas Price Hike in Armenia*: https://openknowledge.worldbank.org/bitstream/handle/10986/11988/WPS6150.pdf?sequence=1

[9] http://www.nature-ic.am/wp-content/uploads/2013/10/1.Armenias-TNC_2015_ENG.pdf, p. 21

Overcoming Barriers to Increased Energy Efficiency in Residential Buildings: Strategy Report', which was one of the outputs of the EBRD's 'Armenia - Improving Energy Efficiency in Residential Buildings' Programme. The legal-regulatory framework includes the cross-cutting framework governing energy efficiency in buildings, as well as legislation on construction. In addition, the National Programme on Renewable Energy and Energy Efficiency identifies the sectors with the largest energy efficiency potential and proposes 16 categories of energy efficiency measures to be taken to reduce energy use, which includes the building sector[10].

Analysis of the World Bank RISE indicators[11] shows that while Armenia has made good progress towards establishing an enabling environment for investment in energy efficiency, there is still much room for improvement in the areas of planning and of policies and regulations in the buildings sector.

A number of initiatives have targeted energy efficiency retrofits in Armenia, but none of them offer targeted finance for building-level retrofits of multi-owner residential buildings. Furthermore, while there are several commercial banks with energy efficiency lending portfolios for SMEs and individual entrepreneurs, the building retrofit sector has not been addressed due to its perceived high risks, such as risks associated with collective decision-making / payment enforcement for multi-owner apartment buildings (detailed analysis of barriers to energy efficiency investment in buildings in Armenia is provided in Section 1.2).

Alignment with related initiatives. The project is fully consistent with the INDC of Armenia approved by the Government in September 2015. As noted above, the INDC identifies "energy (renewable energy and energy efficiency)" and "urban development (building and construction)" among the main sectors included in the national mitigation contributions. The INDC also identifies "Energy" and "Human Settlements" as being among the most vulnerable sectors to climate change. Further, the INDC emphasises that "the climate change mitigation actions should not reverse the social and economic trends of Armenia, but contribute to the socioeconomic development of the country", which is precisely what this project intends to achieve in the context of climate change mitigation measures in Armenia's building sector. Finally, the INDC recognises that the achievement of the national climate change mitigation target will require "the support of adequate (necessary and sufficient) international financial, technological and capacity building assistance", including from the GCF.

This project will promote application of energy efficiency principles in Armenia through implementation of corresponding policies and practices in line with the identified priorities for low-emission and climate-resilient development, in particular the following:

- The National Programme for Energy Saving and Renewable Energy (2007) prioritises the alignment of state policy on development, and directs finance and credit policy of the country to energy saving and establishing and maintaining an active market structure for energy efficiency benefits and providing an effective mechanism for market participants.
- Two laws governing energy efficiency: The Law of the Republic of Armenia on Energy (2001) and the Law on Energy Saving and Renewable Energy (2004). These laws define the main terms and principles for the energy sector, including ensuring efficient use of energy; ensuring the energy independence of Armenia; and creating new industries and organising new services, implementing targeted national programmes and applying new technologies in order to promote the development of renewable energy and energy saving.

The project and its interventions are strongly aligned with the recently-prepared Government of Armenia 'Energy Efficient Public Buildings and Housing in Armenia NAMA' (2014)[12]. This NAMA will promote energy efficiency in public buildings and social housing, with a particular focus on energy efficiency measures in new construction, capital renovation and in management of public buildings. The NAMA will assist the cities of Armenia to meet their commitments to reduce GHG emissions from energy consumption by 20% by 2020. The UNDP-GCF project is specifically designed to support the NAMA in achieving transformational change by targeting the following NAMA objectives:

- Support policy, regulatory, institutional and market transformation, leading to a higher level of energy efficiency of structures and reduced GHG emissions from the building sector.

[10] Detailed overview of governmental policies, legislation and by-laws on energy efficiency in building sector is presented in Section 1.2

[11] Armenian RISE Indicators are presented in Annex 8

[12] http://www4.unfccc.int/sites/nama/SitePages/Country.aspx?CountryId=8

- Contribute to improved energy performance of public buildings in health, educational, cultural and other sectors, improving comfort levels and cutting public budget allocations for energy bills while improving the overall quality of public services.
- Support the provision of adequate and affordable housing in Armenia using the integrated building design concept, and contribute to reducing the total operational costs of buildings, reducing public costs and costs for the users / clients.
- Contribute to the development objectives of Armenia (environment, economic, and social) related to the construction and building sector.
- Support transformational change to a low-emission development pathway in the longer term.
- Contribute to improving Armenia's energy security.

The project is further aligned with the Yerevan City Sustainable Energy Action Plan (SEAP)[13] (2016), which notes the importance of the housing sector in that it is responsible for almost half of all emissions and energy consumption. The SEAP outlines a range of energy efficiency measures to be take in public buildings, and also measures aimed and energy efficiency and GHG emissions reduction in the housing sector.

Gender issues. Due to Armenia's high dependence on energy imports, users are vulnerable to fluctuating energy prices, reliability of supply, and potential supply gaps. Given the role of women in Armenia and the higher female unemployment rate, women spend more time at home than men and suffer more from these impacts. However, the literacy rate is high and women can play a key role in household energy use and energy efficiency projects that, if given the opportunity, can make and influence decisions to improve the situation. With appropriate information and awareness, they can also educate and shape their children's future energy consumption habits. Many women are interested in energy-efficiency projects but the limited or lack of awareness prevent them from adopting new energy saving technology and efficiency options.[14]

While there have been projects to improve energy supply and energy efficiency as well as gender assessments that have been conducted for Armenia, there have not been any comprehensive assessments on how gender is implicated in these projects or measurements of benefits that women received.[15] There have been studies to monitor the social benefits of the energy efficiency projects they funded but there were no sex-disaggregated data to reflect gender balance on social benefits.[16] In addition, energy efficiency projects have been assumed that men and women benefit in the same way. The project will be an opportunity to recognize that collection of sex-aggregated baseline data is critical in monitoring the development impacts of energy efficiency projects.

1.2. Barriers, current government policy to address root causes and threats

Achieving thermal modernisation through energy efficiency retrofits in all building sectors is a national development priority, particularly for multi-apartment buildings. Energy efficiency retrofits are the centrepiece of the first NAMA prepared by the country, and will assist cities of Armenia to meet their commitments to reduce GHG emissions from energy consumption by 20% by 2020. Retrofits also reduce the negative social impact of the rises in energy tariffs – average electricity tariffs for residential customers almost doubled between 2008 and 2014, and natural gas tariffs increased by 2.6 times over the same period – and they prolong the lifetime of the building stock (among numerous other benefits). While achieving thermal modernisation through energy efficiency retrofits in all building sectors is a national priority, more can be done in the policy sphere to encourage investment in such retrofits. In addition to policy barriers, a number of other types of barriers continue to prevent the investment of private sector capital in energy efficiency building retrofits.

Historically, awareness of costs and opportunities related to building energy use has been very low. Compounding this lack of awareness, widespread poverty coupled with energy prices that are still not fully cost-reflective lead to a reduced incentive to invest in energy efficiency. In a vicious circle, the lack of a market for energy efficiency retrofits leads to reluctance on the part of banks to provide loans for

[13] https://www.yerevan.am/uploads/media/default/0001/53/cee6ef808b9d3fb917d37ea060c135cf34179466.pdf

[14] ADB. Armenia Country Gender Assessment. 2014. http://www.adb.org/documents/armenia-country-gender-assessment.

[15] Ibid, p.73.

[16] http://r2e2.am/en/2011/06/studies/

such projects, which in turn prevents the market from developing. This lack of a market leads, in turn, to a low capacity of building sector players to implement energy efficiency retrofits.

There are also barriers specific to particular sectors. In the public sector, budgets are managed in ways that do not incentivise building operators to save energy. For instance, municipal energy budgets are reduced when energy efficiency is achieved (since budgets are determined by the previous year's actual expenditures). This reduces the interest of both building managers and the private sector (ESCOs) in pursuing energy efficiency services based on Energy Performance Contracts (EPCs) since the payment allowance reduces public institutions' ability to pay for such services as a result of subsequent budget reductions.

In apartment buildings, piecemeal efforts at renovation by owners of individual apartments can have only limited effects; the greatest potential for energy savings lies in retrofits of buildings as a whole. There are, however, a number of barriers to collective action by the owners of apartments in multi-owner buildings that make such building-level retrofits challenging to achieve without targeted efforts at barrier removal:

- Reluctance by banks to finance such investments – home owner associations may not be bankable entities and the recourse mechanism may be unclear.
- The need for agreement between a large number of owners, which may include absentee landlords with little incentive to invest in energy-saving measures and poor households that are unable to afford the up-front costs.
- Lack of clarity on ownership of, and responsibility for, common areas of buildings.

Due to these policy, financial, market and technical/capacity barriers, the overall investment risk profile of energy efficiency building retrofits is prohibitive in Armenia, deterring private and public investment despite the vast potential for highly cost-effective energy-saving and GHG emission reduction opportunities.

1.2.1. Barriers

The key barriers to building energy efficiency retrofits are outlined in Table 1 below. While many donors support efforts to improve the energy efficiency of the Armenian economy, in the absence of the GCF contribution the market barriers outlined here are likely to continue to limit investments in energy savings and restrict the participation of private sector capital, leading to a lack of access to energy efficiency finance.

Table 1. Key barriers to energy efficiency building retrofits

Barrier type	Description	Sector	Priority
	Insufficient financial resources: many home-owners and public sector entities lack the financial resources necessary to undertake energy efficiency building retrofits without loans. This is a particular challenge in the lower socio-economic groups, which simultaneously are in most need of loans but also represent the least credit-worthy consumers.	All, particularly residential sector	Very high: the upfront investment costs of energy efficiency building retrofits severely restrict the ability of home-owners and public sector entities to make necessary investments. The project will address this directly through piloting incentive measures for low-income households, and working with the Government to create local support measures for energy efficient retrofits in the low-income sector.
	Local commercial banks are reluctant to provide loans for energy efficiency renovation to home-owners or public agencies due to perceived high lending risks.	All, particularly residential sector	Very high: the inability to access finance for energy efficiency building retrofits due to the perceived lending risks restricts the growth of the market. By reducing the risks, improving the financial viability of energy efficiency retrofit projects and increasing the understanding of banks of these risks/opportunities, the entire building sector can be shifted onto a more sustainable, low-emission trajectory.
	Reduced incentives for home-owners and public agencies to look for more	All	Medium-high: Energy tariffs are not yet fully cost-reflective. Although average

Barrier type	Description	Sector	Priority
	energy-efficient solutions due to low energy prices.		tariffs have increased substantially over the last 10 years, this does not yet provide sufficient incentive to invest in energy efficiency building retrofits, particularly in the public sector where incentives are weaker as building operators often do not pay energy bills.
Financial / institutional	Low incentives for reducing energy bills: public budgets are managed to prioritise short-term concerns. Ownership and operating structure of public buildings and their expenditures (e.g. energy bills) are often paid out of municipal budgets or, for schools and hospitals, through education or hospital boards.	Public	High: There is often little incentive for building operators to save energy, especially when budgets are allocated on an annual basis. There is a need to reallocate incentives to drive investment in energy efficiency retrofits in public buildings.
	Voluntary building codes: Building energy codes for new residential builds are only partially enforced while renovated buildings are not required to meet any building energy codes. There is also no standardised rating system for buildings' energy efficiency.	All	High: there is little incentive for energy efficiency retrofits when building codes do not define the level of energy efficiency required from energy efficiency retrofits. Introduction of building codes for energy efficiency retrofits can drive the demand for private sector investment across all building sectors.
	Enforcement of energy efficiency requirements is low. While a UNDP-GEF energy efficiency buildings project has started to introduce an energy passport programme, enforcement capacity remains low and few energy audits are conducted to determine the actual performance of buildings and their compliance with building codes.	All	Very high: Without audits, there are no 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 (which can help to overcome information barriers for energy efficiency building retrofits).
	Weak capacity in multi-owner apartment buildings: building management and repair, project development, financial planning and management, fund-raising, human resource management, accounting, reporting and customer relations are weak.	Multi-owner buildings	High: Multi-owner property and collective decision-making is particularly difficult and there is an absence of appropriate, and enforced, secondary legislation. The inability of building owners to collectively decide upon investments restricts energy efficiency retrofit market potential.
	Inflexible investment decision-making practices: first-cost procurement practices, whereby decisions on retrofit/renovation projects are made on the basis of initial construction costs instead of life-cycle costs, discriminate against efficient building retrofits, which may have higher up-front costs but which have lower operating costs.	All	Medium-High: This is a significant barrier for state sector construction and retrofits, but since state construction has a limited share of the market, the impact of this barrier on the buildings sector as a whole is limited.
Technical / capacity	Low capacities of building sector players: knowledge and tradition of designing and building energy efficient buildings as well as efficiently operating energy use in buildings is low as there was previously no incentive due to poor enforcement and lack of understanding of the benefits of energy efficiency buildings.	All	Very high: Even if codes are strengthened, compliance will not be possible without architects and builders who can design more efficient, code-compliant buildings.
	Energy efficiency is not fully evaluated and recognised for most people in Armenia. There is a low level of	All	Medium-High: While improved codes will mandate increased efficiency, this perception could keep architects and

Barrier type	Description	Sector	Priority
	awareness among building owners, the absence of building certification practice the real estate agencies and occupants are not aware on operational costs and potential energy and money saving opportunities. There is also a misinformed perception that full compliance with efficient building codes and energy-efficient buildings would be prohibitively expensive in Armenia.		builders (and buyers in the absence of building energy performance rating standards) from considering buildings that exceed the energy performance requirements in the code and moving the market forward.
	Immature market for energy efficiency products and services: outdated technologies and inefficient materials in use by a large number of construction and maintenance companies.	All	High: 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.
	Immature market for energy efficiency products and services: out-dated technologies and inefficient materials in use by a large number of construction and maintenance companies.	All	High: An existing UNDP project has started to put in place a system of testing and certifying construction materials and performance requirements. However, broadening the adoption of this practice and strengthening enforcement are required.
	Construction materials are not certified for energy performance.	All	High: Uncertified materials will make it very difficult for architects and builders to ensure that their buildings are code-compliant and attain desired energy performance.

1.2.2. Overview of existing Government policy

Armenia's Third National Communication to the UNFCCC was published in 2015 and provides an up-to-date overview of policies and measures for mitigation of GHG emissions in the country. It identifies buildings as a priority sector for national mitigation actions. Armenia's UNFCCC TNA[17] identified heat supply to buildings as one of the main sources of GHG emissions and as having a large potential for energy saving and emission reduction. The draft INDC also recognises the need for addressing efficiency in buildings.

Energy efficiency principles are governed in Armenia through the provisions of the *National Energy Efficiency Programme* (2007), the *Concept for Ensuring Energy Security* (2013) and the *Energy Security Strategy Action Plan* (2014), which identify the energy efficiency potential for the buildings sector and provide outlines of technical measures/solutions to be taken; building energy efficiency goals are also outlined in the Covenant of Mayors (a 17-city joint agreement).

a) General regulatory framework

The general legal-regulatory framework governing energy efficiency in buildings includes the following:

Cross cutting legal-regulatory framework governing energy efficiency in buildings

- Republic of Armenia (RA) Constitution
- RA Civil Code
- RA Law "On Legal Acts"
- RA Law "On Energy"
- RA Law "On Energy Saving and Renewable Energy"

[17] Ministry of Nature Protection of the Republic of Armenia, 2003, Armenia - Country Study on Climate Change. Phase II. Downloaded from:

http://unfccc.int/ttclear/misc_/StaticFiles/gnwoerk_static/TNR_CRE/e9067c6e3b97459989b2196f12155ad5/19789a07b4de493cb72e43c47fd4db1e.pdf

Construction	• RA Law “On Urban Development” • RA Law “On Technical Regulation” • RA Law “On Standardisation” • RA Law “On Management of Multi-Apartment Buildings” • RA Law “On Condominiums” • RA Law “On State Allowances” • RA Government Protocol Decree N 43 of November 4, 2010 • RA Government Decree N1161-N of 4 October 2007.

Law on energy savings and renewable energy: The Government of Armenia’s commitment to promotion of energy efficiency in buildings is reflected in the *Law on Energy Saving and Renewable Energy* (ESRE, 2004 and amended in 2016). The Law lays out the principles of the Government’s policy and governance structure supporting energy efficiency, and provides for energy efficiency standards, audits and awareness-raising. The Law on ESRE provides for the development of mechanisms to enforce a wide array of energy efficiency measures; however, many of these have yet to be developed and implemented. Such mechanisms include:

- *State-administered programmes:* The Law allows for the development, adoption and implementation of a national, targeted programme for energy savings and renewable energy coordination among state programmes to promote energy efficiency, and the incorporation of energy savings requirements in state programmes on the economic development of Armenia.
- *Standards:* The Law commissions the National Standardisation Institute to adopt national energy-saving standards, including: *building and construction technical requirements* for heating, lighting, ventilation, water supply and sewage.
- *Training and education:* The Law instructs the state administration authorised body for education to incorporate energy savings into the curricula of elementary, secondary, graduate, supplementary and post-graduate educational institutions, and to develop energy savings educational training programmes for engineering staff.
- *Information dissemination:* Campaigns are related to:
  - Existing energy efficient devices, technologies and machinery
  - Energy efficiency pilot projects
  - Energy efficiency national objectives
  - Environmental, economic and social benefits of energy efficiency
- *Energy audits:* The Law covers energy audits. However, the Government decree “on performing energy audits” is considered too general and mostly covers the industrial energy auditing process rather than residential buildings. The decree “on energy audits” was amended and now introduces a separate section on buildings energy audit. In the framework of the UNDP-GEF project, the national standard for a building energy passport, an energy efficiency label and the associated methodology were developed and registered in 2013. The national standard on the methodology of implementation of buildings’ energy audits was developed in the frames of UNDP-GEF project and registered by National Institute of Standards in 2016.
- *International cooperation:* The Law recommends international cooperation regarding the exchange of energy efficient technologies, information, mutual recognition of standards and certification, and development and implementation of joint energy saving programmes and projects.
- *Fiscal incentives:* The Law commissions the authorised state body for energy savings to submit proposals to the Government on additions to the Customs Code of the Republic of Armenia and the Republic of Armenia law for zero-rate customs duty and excise duty exemption.
- *Updating existing compliance certification*: The Law directs the appropriate state body to submit proposals to the Government to include energy savings requirements and national objectives in the Republic of Armenia law “*On Certification of Compliance of Goods and Services with Normative Requirements*”.
- *Resolution No.1504 on Integration of Energy Efficiency in New Construction or Reconstruction Projects funded by State Budget Resources:* adopted by the Armenian Government on 25 December 2014, this Resolution makes energy efficiency as well as cost-effective renewable energy solutions mandatory for integration in construction / reconstruction projects, although it conflicts with public procurement rules requiring lowest-cost solutions.

National Programme on Renewable Energy and Energy Efficiency: This National Programme identifies the sectors with the largest energy efficiency potential and proposes 16 categories of energy efficiency measures (including technical, institutional, administrative, financial, etc.) to be taken to reduce energy use. The National Programme was further supported by the 2007-2009 Implementation Plan and adoption of the *National Energy Efficiency Action Plan* (2010), which aims at providing the pathway for energy efficiency in Armenia until 2020, including an implementation plan, preparing an enabling environment and removing existing barriers.

***First National Energy Efficiency Action Plan*:** The principal energy efficiency measures proposed by the 2010 NEEAP relevant to energy efficiency in buildings include[18]:

Horizontal measures	• Implementation of a regular national "Energy Statistic" (with annual updates) • Establishment of a "National Energy Agency for Energy Efficiency and Renewable Energy" • Financial Support for Energy Efficiency measures in all sectors • Information campaigns, training and education in the area of energy efficiency improvements • Amendments to the existing Energy Law and the Law on Energy Saving and Renewable Energy • Removing inadequate gas and electricity tariff structures to encourage energy savings • Public procurement for energy efficiency
Building Sector	• Introduction of a National Building Code encompassing the energy performance of buildings • Standards and calculation methodology to assess energy performance in buildings • Institutional capacity-building for implementing and enforcing new standards • Establishing quality assurance/quality control (QA/QC) standards that will support the certification of key building materials for energy performance • Setting up road-testing procedures for building certification and a methodology for assessment of energy performance for pilot buildings • Training and education to promote an integrated building design approach and energy performance requirements in buildings • Pilot project: design competition and construction of several "best-practice" buildings (e.g. school or other public building, and a multi-family house) in Yerevan and another large city, using an integrated building design approach within the available budget and time schedule for the construction of a typical building. • Development of an incentive scheme to promote energy efficient construction or reconstruction in residential and service buildings
Public and Private Service Sector	• Information campaigns on a range of energy efficiency issues to be applied in public and private service buildings • Monitoring of energy consumption and achieved savings in service buildings

1.2.3. International treaties

Energy Charter Treaty: The Republic of Armenia ratified the Energy Charter Treaty in December 1997.

National Energy Efficiency Action Plan (NEEAP): As an observer to the Energy Community, Armenia prepared its first NEEAP in 2010, and preparation for the second NEEAP is currently underway.

1.2.4. Secondary legislation

Draft Technical Regulation on "Buildings and structures/premises, construction materials and products: Safety": The UNDP-GEF "Improving Energy Efficiency in Buildings" project supported the elaboration of the draft technical regulation (TR), "Buildings and structures/premises, construction materials and products: safety", which defines the energy performance of buildings; energy efficiency requirements, state control in this field, minimum performance requirements, passportisation, etc.

[18] The Second NEEAP is developed, circulated among ministries and pending the Governmental approval (October, 2016)

Draft Technical Regulation on "Building Energy Efficiency": The UNDP-GEF "Improving Energy Efficiency in Buildings" project has also supported the elaboration of the TR "Building Energy Efficiency", which transposes the key elements of the EU Directive of Energy Performance in Buildings (EPBD).

Technical regulation on "Mandatory consideration of energy efficiency in construction/reconstruction under the state funded activities": The UNDP supported Ministry of Urban Development (currently restructured as a Committee) in development of the mentioned technical regulation, adopted by Government in December 2014.

Normative-technical documentation: Sets "Norms and Standards in Construction" and "Construction thermal physics of the building envelopes and design norms" and includes a number of international (ISO), European (EN) and CIS (MSN) construction norms and standards localised (adapted) to Armenia.

New building code (SNiP) "Thermal Protection of Buildings" adopted by order of the Minister of Urban Development and registered by Ministry of Justice in July 2016.

b) Analysis of building sector energy efficiency specific policy

Analysis of the World Bank RISE indicators[19] (see Annex 8) shows that, while Armenia has made good progress towards establishing enabling environments for investment in energy efficiency in the buildings sector, there is still much room for improvement in the areas of planning and of policies and regulations.

Planning: In terms of planning, there are no national entities certifying policy compliance with building energy efficiency standards.

Policies and regulations: the information provided to consumers by utility providers about their electricity usage does not provide any guidance on how consumers could make their energy use more efficient or compare their energy usage to other consumers in the same geographical area or income class. Collecting and sharing this information with consumers can increase their willingness to implement energy efficiency and reduce energy consumption.

c) Public buildings sub-sector analysis

Planning: There is no national plan for energy efficiency for public buildings or entities established to ensure building energy efficiency compliance. The establishment of national entities to enforce compulsory energy efficiency codes would encourage compliance.

Policies and regulations: Importantly, there are no binding energy savings obligations for public buildings or incentives or mandates for public entities to invest in energy efficiency. In other countries, encouraging energy efficiency through mandates and incentives has proven an effective instrument to encourage investment, from both the public and private sectors.

Owing largely to the management, ownership and operating structure of public buildings and their expenditures (e.g. energy bills are often paid out of municipal budgets or, for schools and hospitals, through education or hospital boards), there is often little incentive for building operators to save energy, especially when budgets are allocated on an annual basis. Similarly, if operating costs are matched by an operating budget then, particularly, public authorities owning or renting the building will have little incentive to reduce the energy costs. Moreover, there are no public budgeting regulations and practices at national or municipal levels that allow public entities to retain the financial savings derived from energy efficiency measures. The development of such public budgeting regulations and practices would provide an incentive for investment in energy efficiency retrofits in public buildings.

d) Residential buildings sub-sector analysis (multi-owner and single dwelling)

Planning: While there is a national plan for energy efficiency and an associated residential buildings target, there are no entities checking building energy efficiency compliance in line with such planning and associated policies.

Policies and regulations: Building energy codes for new residential builds are only partially enforced while renovated buildings are not required to meet any building energy codes. Furthermore, there is no

[19] See http://rise.worldbank.org/

standardised rating or labelling system for energy performance in existing buildings, nor are building owners required to disclose property energy usage at point of sale or when leased.

Regular provision of updates to building codes, their enforcement and introduction of building codes for existing buildings can drive the demand for private sector investment in energy efficiency building retrofits across all building sectors. In addition, introducing building codes for renovated buildings, improving enforcement as well as making it a requirement to disclose energy usage would create enabling environments for investment in energy efficiency retrofits.

Policy analysis conclusions: The overall consensus among national stakeholders is that Armenia needs to introduce binding legislation stipulating energy auditing, energy passports/certificates and labelling of buildings, and mandatory enforcement of building energy codes with compulsory application to new buildings as well as gradual application to already-existing ones. The enforcement of policy priorities in the field of building energy efficiency will require substantially stronger political engagement and capacities.

1.3. Related initiatives

The Armenian Government continues to work actively with development partners such as UNDP, the World Bank, the EBRD, USAID and other donors on energy efficiency programmes to improve energy efficiency in buildings. However, existing building energy efficiency projects have targeted new builds, energy efficiency retrofits mainly in public sector buildings, while residential, commercial, and industrial retrofits have been largely overlooked due to the high levels of financial risk they pose. The potential for energy efficiency retrofits in these buildings is particularly high, especially panel buildings. Furthermore, while there are several commercial banks with energy efficiency lending portfolios for SMEs and individual entrepreneurs, the building retrofit sector has not been addressed due to its perceived high risks, such as risks associated with collective decision-making / payment enforcement for multi-owner apartment buildings.

In terms of activities specifically focused on energy efficiency buildings renovation, the World Bank (through different Project Implementation Units and the R2E2 Fund) finances renovation in the public sector. Other FIs (EBRD, AFD, IFC, GGF, KfW) are implementing or planning to implement credit facilities for the residential sector, predominantly through participating banks / credit institutions, and offering energy efficiency loans for household energy efficiency retrofits. However, none of these institutions offers residential energy efficiency financing for building-level solutions that would enable home owner associations of the owners of apartments in multi-apartment buildings to obtain financing for a retrofit of the building as a whole. Such building-level retrofits can achieve much higher energy savings than those that are feasible through the individual actions of single apartment owners.

The following initiatives have targeted energy efficiency retrofits in Armenia (none of these initiatives offer targeted finance for building-level retrofits of multi-owner residential buildings):

- **UNDP** has implemented a project aimed at improving energy efficiency in buildings, which included significant support to the Armenian Government to harmonize and adopt the EPBD and to develop secondary legislation for energy efficiency in buildings. Under the project a first demonstration of thermal modernisation of a residential multi-apartment building in Avan district of Yerevan was held, as well as for social housing in Goris and Akhuryan cities.
- **Ararat, Ineco and ACBA Bank and ACBA Leasing** have received multi-million dollar credit lines for energy efficiency loans from the Green for Growth Fund.
- **World Bank R2E2 fund:** is involved in the “Black Sea Buildings Energy Efficiency Plan Project” (BSBEEP, 2013-2015) within the EU-funded Black Sea Joint Operation Programme, with the overall objective of strengthening the administrative capacity of local authorities and exchanging good practice knowledge in energy efficiency in buildings.
- **AFD** is working with the National Mortgage Company and 14 FIs on household energy efficiency loans and energy efficiency mortgage loans with an overall EUR 10 million credit line and a target of 3,000 households to be reached within the first year of the programme (2015).
- **International Finance Corporation (IFC)** is implementing Sustainable Energy Finance projects, working with Byblos Bank on energy efficiency lending for households and HSBC for energy efficiency in SMEs.
- **EBRD** EnergoCredit facility provides energy efficiency loans for residential and business clients.

- **Habitat for Humanity Armenia** has worked with Inecobank within REELIH (Residential Energy Efficiency in Low Income Houses) project on residential energy efficiency upgrades, serving a total of 99 families in 3 buildings.
- **Ameria Bank** also offers household and SME energy efficiency loan products supported with its own financial resources.

2. STRATEGY

2.1. Project objective

2.1.1. Objective

To scale-up investment in energy efficiency building retrofits in Armenia, and reduce the overall investment risk profile of energy efficiency building retrofits to encourage private sector investment and reduce fuel poverty.

The project will create a favourable market environment and scalable business model for investment in energy efficiency retrofits, leading to sizeable energy savings and accompanying GHG emissions (between 4.4 and 5.2 million tCO_2 over the 20-year lifetime of the investments); green job creation and poverty reduction. It will also catalyse additional private and public sector financing of approximately US$ 100 million.

2.1.2. Overview

The project is designed to address market barriers to energy efficient building renovation via a combination of policy and financial de-risking instruments and targeted financial incentives to key market players, such as building owners and energy service companies (ESCOs). By targeting policy, financial, market and technical/capacity barriers, the project will significantly scale-up investment in energy efficiency building retrofits in Armenia, and reduce the overall investment risk profile of energy efficiency building retrofits to encourage private sector investment.

The project is aligned with the GCF investment framework and proposed regional prioritisation scheme, which emphasises the significant potential in Eastern Europe for retrofitting and upgrading existing infrastructure, and for supporting efforts to strengthen urban systems.

The project builds on and leverages UNDP's extensive experience supporting the Government of Armenia and successfully engaging the private sector in reducing the barriers for energy efficiency in heating, building and lighting sectors: the development and enactment of national energy efficiency building codes and energy audits (for new and existing building stock); the elaboration of national / sectoral / local energy efficiency actions plans and accompanying MRV systems; and de-risking approaches for low-carbon investment using UNDP's successful framework approach to de-risking investment in energy efficiency (see **Error! Reference source not found.**).

UNDP will work with Government and private sector stakeholders, including international financial institutions, to systematically identify the most cost-effective policy, financial, market and technical/capacity de-risking measures with the aim of achieving a risk-return profile for energy efficiency building retrofits that can attract investments, including from national budgets, commercial banks and other private sector stakeholders such as ESCOs.

2.2. Project Components, Outcomes and Outputs

Investments in energy efficiency building retrofits face different risks and barriers for each building category. The principal building categories distinguished and targeted in this project will be public buildings (schools, hospitals, municipal/Government offices) and, in the residential sector, individual houses and multi-owner apartment buildings. For each targeted building stock, a package of relevant policy and financial de-risking instruments will be identified and implemented to address the specific circumstances and barriers in the country and in the targeted building sub-sector. This specificity will create an easily-scalable model for subsequent replication of energy efficiency retrofits and market growth.

The activities of the project will be structured under four components:

Component 1 – Establishment of building sector MRV and knowledge management
Component 2 – Policy de-risking
Component 3 – Financial de-risking
Component 4 – Financial incentives.

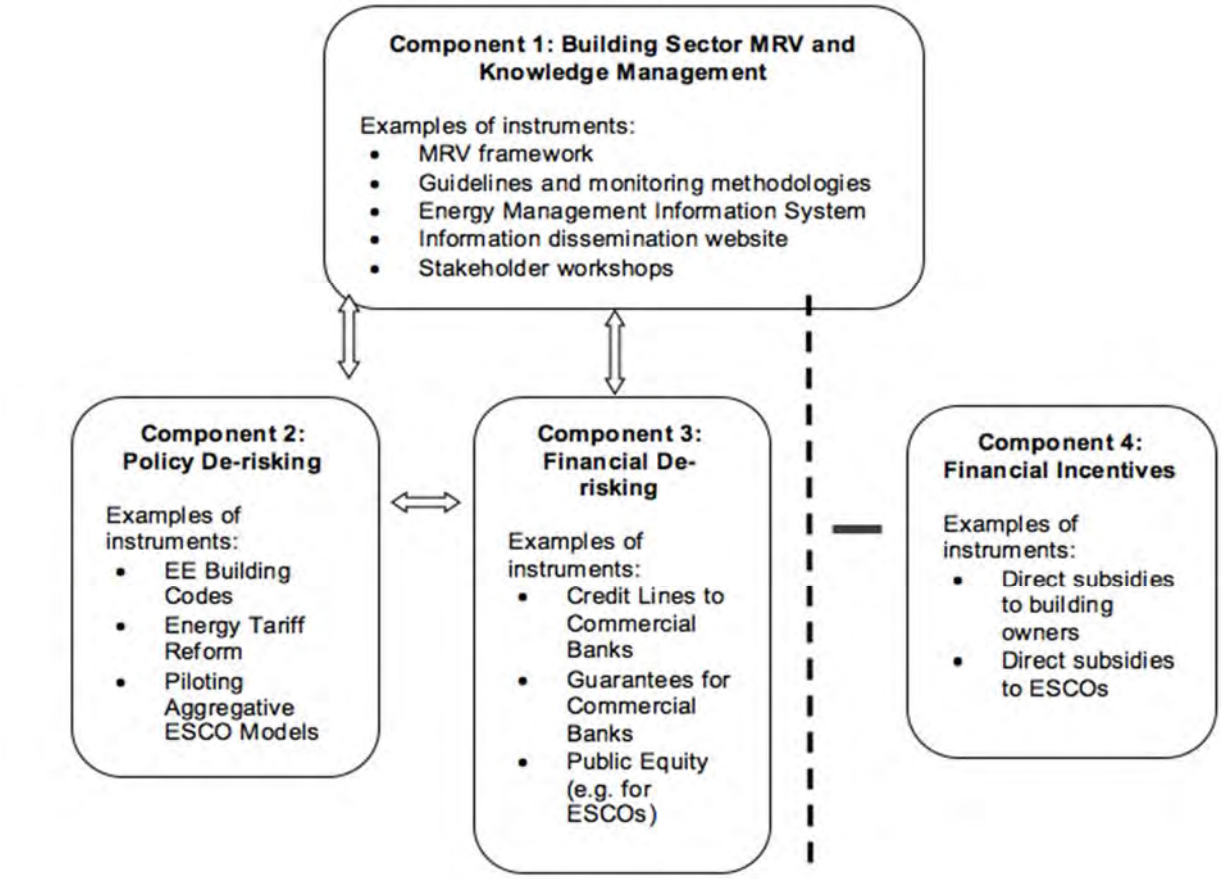

Figure 1. De-risking approach for energy efficiency building retrofits

Component 1 – Establishment of building sector MRV and knowledge management

Component 1 aims to establish robust MRV for the building sector to enable monitoring of energy use in buildings, prioritisation of buildings for energy efficiency retrofits, and quantification and monetisation of the resulting energy savings. Robust MRV is necessary to build the investment case for energy efficiency retrofits.

The project will support the development of an MRV framework, including guidelines and methodologies and building on UNDP's extensive experience with establishing Energy Management Information Systems (EMIS)[20] for buildings.[21] The project will then disseminate information on the cost-saving potential of energy efficiency retrofits to commercial banks and potential borrowers via the project website and stakeholder workshops.

The common set of strategic and powerful metrics for measuring results will be critical, both to communicating broadly on the financial and development gains to be made from energy efficiency investments, and to mobilising additional resources and support.

The project will contribute to the creation of knowledge and collective learning processes through promoting better information dissemination to stakeholders, including the private sector, and sharing lessons learned.

[20] An Energy Management Information System (EMIS) refers to a computer-based system for collecting, storing and analysing information on the energy performance of the monitored objects. Energy use data for individual objects (buildings) can be aggregated and monitored at sectoral, regional and national level, depending on the eventual set-up of the system.
[21] UNDP first piloted and scaled-up EMIS in public sector in Croatia, where the project freed up US$ 18 million of public budget annually.

The potential role of women in implementation of Component 1 is significant. Women can be agents of change in creating awareness on the benefits of EE investments. According to the Armenia Country Gender Assessment (July 2015) of the Asian Development Bank, many women are interested in energy-efficient and renewable energy projects, and know examples of pilot projects that they thought successful[22]. Indicators of women participation in this area will be monitored during implementation.

The desired outcome of Component 1 is Outcome 1: Robust MRV of GHG emissions from the building sector established.

The outputs and activities that will contribute to achieving this outcome are described below.

Output 1.1 MRV systems for the buildings sector in Armenia established

Under Component 1, technical assistance will be provided to market stakeholders in order to undertake MRV and report on energy savings. This technical assistance will include the following Activities:

1.1.1 Development of the MRV framework, including guidelines and monitoring methodologies for the various categories of buildings.

1.1.2 Support to full implementation of building EMIS in selected buildings for demonstration and capacity building purposes.

Output 1.2 Knowledge management and MRV Information disseminated

Dissemination of information, including that gained from EMIS for buildings, will help to establish the business case for energy efficiency building retrofits.

An effective communication and dissemination strategy is critically important to scaling-up activities beyond those that will be part of this project. The project will consult both men and women on the type of information needs during scoping.

The knowledge management plan will be detailed at project inception, according to local context and the experience of project managers and other contributors. A communication and dissemination strategy will be developed (based on scoping, consultation with local stakeholders, understanding the baseline of awareness and the types of information needs) and will include the following Activities:

1.2.1 Identify appropriate formats for reaching the relevant stakeholders:

- The general public (this will be through a nationwide media campaign on building energy efficiency retrofits in which selected retrofit case-studies will be featured).
- Municipal staff in charge of the allocation of resources in areas of urban planning and development, energy services, as well as municipal procurement.
- National Government officials.
- Companies in the buildings, renovation and energy services sectors.
- Financial institutions.

1.2.2 Establish a website that will provide information and a platform for communication between the different stakeholders, thus enhancing cooperation and learning through the exchange of knowledge and skills.

Information about the project, activities and outputs will be made available and linked to building energy efficiency retrofit efforts in other countries. It will be updated regularly to reflect content created, developments during project implementation and case-studies. The site will collect resources relating to energy efficiency building renovation and make it possible to keep up to date with developments. The website will be regularly updated on activities, best practices and latest thinking. Content will be reviewed to ensure that it is gender sensitive. An online survey may be established to capture the gender of users.

1.2.3 Information dissemination to maximize the impact potential of the project in Armenia and beyond. Formats for information dissemination will be developed based on their likely effectiveness for raising awareness, facilitating information access and providing actionable guidance and support to the sector. The following formats will be considered:

- *Seminars*, including themed national workshops focusing on best practice in building energy efficiency retrofits, potentially on an annual basis.

[22] http://www.adb.org/sites/default/files/institutional-document/162152/arm-country-gender-assessment.pdf

- *Tours of buildings* in which energy efficiency retrofits have been conducted. Presentations will be given by relevant project promoters to provide a powerful example of how these investments were achieved, and open up discussion regarding replication in other buildings.
- *Municipal energy efficiency corners* to provide information to the general public about the newest energy efficiency systems, products and materials available in Armenia
- *Promotional material* – e.g. case studies, brochures and briefings.
- *Aggregating lessons learned* – including through after-action reviews across project activities.

In addition, to maximise the impact potential of project results internationally, in particular in countries from the region with similar policy and market environment and barriers, the project will communicate and make publicly available related knowledge and best practices (e.g. examples of legislation and frameworks for building codes, procedures for home owner associations, legislation regarding multi-owner buildings, business models for energy efficiency investments, etc.) via the following channels:

- The existing portal, 'Energy Efficient Buildings in Central Asia and Armenia' at www.beeca.net (in English and Russian), will present and share all relevant materials and case studies with energy efficiency practitioners in Armenia and other transition countries with similar climate and policy conditions. In particular, the potential for energy efficiency market transformation in building sectors in Central Asia is vast and barriers are similar – hence GCF-supported work will be of high relevance to those countries as well;
- Presentation of project work and results at the annual Sustainable Energy Forum organised jointly by UNECE, UNDP and other international partners on a regular basis, as well as at other relevant international fora and initiatives, such as those of SE4ALL.

1.2.4 Provision of information to consumers: Economically attractive measures for energy efficiency are often left un-implemented because stakeholders are simply unaware that such measures exist. If they are aware, they may have unreliable information. Hence, the availability of information on energy efficiency and opportunities for savings is an important precondition to enabling them to act on these opportunities. In Armenia, consumers currently do not receive information on ways to use electricity more efficiently[23].

The project will work with the national energy utility to develop modalities for the provision of information on energy efficiency to consumers. The details of the strategy to provide information to consumers will be developed during inception phase in close cooperation with consumer protection non-profit organizations.

In developing information-awareness materials on MRV, EMIS, energy efficient building retrofits, and how to access affordable capital for building retrofits, the project will ensure that information is disseminated among and used, as appropriate, by women and men.

Component 2 – Policy de-risking

The policy de-risking component will support national, sub-national and local authorities to adopt and implement an enabling policy framework for energy efficiency retrofits. De-risking instruments will directly and indirectly address investment risks for commercial lenders of energy efficiency retrofit finance.

This Component will support on-going legal reform in the field of energy efficiency. It will also support the gradual introduction of binding legislation on energy auditing, energy passports/certificates and labelling for existing buildings. This work will leverage the results of the UNDP-implemented, GEF-financed "Improving Energy Efficiency in Buildings"[24] project. Policy de-risking tools will include: the modernisation and enforcement of energy efficiency standards and mandatory energy performance standards for retrofitted buildings, as well as monitoring and enforcement of associated construction norms and standards; the development, introduction and enforcement of adequate secondary legislation for providing a clear and effective set of functional models and a standard set of rules for all

[23] World Bank Group (2013). *Pilot Report: RISE Readiness for Investment in Sustainable Energy - A Tool for Policymakers*

[24] https://www.thegef.org/gef/project_detail?projID=3935

multi-apartment building management bodies to undertake energy efficiency retrofits; the implementation and improvement of existing legislation and formulation of secondary legislation that will assist the management of energy efficiency building retrofits for different types of building; and assistance to residents and common-share building organisations on collective decision-making on the complex issues of energy efficiency retrofit investment.

Significant capacity building will take place through this component. UNDP's approach to capacity building addresses capacity at the individual, organisational and systemic levels. At the individual level, capacity building takes place through imparting knowledge and skills. At the organisational level, UNDP focuses on supporting organisations to develop mandates, tools, guidelines and information management systems that allow organisations to adopt best practice and adapt to change. At the systemic level, UNDP supports the creation of enabling environments through policy, economic, regulatory and accountability frameworks within which organisations and individuals operate. For all three levels of capacity building, UNDP will identify and hire international and local specialists that will work along-side local legislators providing on-the-job training on best practices. Specialists, working together with the national and municipal legislators, will prepare studies and reviews that underpin the creation of knowledge and the building of skills. In some cases, training courses may be provided to communicate knowledge to wider audiences.

The policy component will also include elements of market de-risking (removing technical and capacity barriers) by providing technical assistance to selected market players such as building owners/managers/owner associations and local government in order to help identify, develop and aggregate technically and financially feasible energy efficiency retrofit projects.

The desired outcome of Component 2 is Outcome 2: National, sub-national and local authorities adopt and implement an enabling policy framework for energy efficiency retrofits.

The Outputs that will contribute to achieving this Outcome are described below.

Output 2.1 Public instruments for the promotion of investment in energy efficiency selected

Activities will include:

2.1.1: Support to policy-makers in selecting public instruments using UNDP's de-risking framework to promote sustainable energy investment in developing countries[25].

The framework is organised into four stages, as outlined below.

Stage 1: *Risk Environment* identifies the set of investment barriers and associated risks relevant to the technology, and analyses how the existence of investment risks can increase financing costs.

Step 1: Determine a multi-stakeholder barrier and risk table for the energy efficiency investment.
Step 2: Quantify the impact of risk categories on increased financing costs.

Stage 2: *Public Instruments* selects a mix of public de-risking instruments to address the investor risks and quantifies how they, in turn, can reduce financing costs. This stage also determines the cost of the selected public de-risking instruments.

Step 1: Select one or more public de-risking instruments to mitigate the identified risk categories.
Step 2: Quantify the impact and the public costs of the public de-risking instruments.

Stage 3: *Cost* determines the degree to which the reduced financing costs impact the investment's life-cycle cost.

Stage 4: *Evaluation* assesses the selected public de-risking instrument mix using four performance metrics, as well as through the use of sensitivity analyses. The four metrics are:

[25] Waissbein, O., Glemarec, Y. et al. (2013). *De-risking Renewable Energy Investment. A Framework to Support* Policymakers *in Selecting Public Instruments to Promote Renewable Energy Investment in Developing Countries*. New York, NY: United Nations Development Programme

(i) investment leverage ratio, (ii) savings leverage ratio, (iii) end-user affordability and (iv) carbon abatement.

The instruments for the promotion of investment in energy efficiency to be considered include:

- Assist at the national and sub-national level in developing on-going funding sources for energy efficiency improvements.
- Assist in developing fiscal policies that will improve the financial attractiveness of energy efficiency (e.g. reduced VAT rate specifically for energy efficiency measures), particularly as they address the needs of very low income households currently receiving state benefits.
- Assist in tariff reform where necessary for specific heating sources (notably electricity and district heating) to reflect actual costs of production – potentially including environmental externalities.
- Assist at the national and sub-national level in developing incentive programmes to encourage energy efficiency measures and/or building stock renewal (e.g. concessional loans, grant programmes, etc. particularly for low-income households).
- Assist in developing utility-run programmes for energy efficiency – especially via large electrical utilities and district heating companies.

Output 2.2 Support provided to on-going legal reform in the field of energy efficiency

Technical assistance on legislative reform, including binding legislation on building codes, adequate secondary legislation on multi-owner building management, and retained savings in public buildings.

In the UNDP-implemented, GEF-financed project "Improving Energy Efficiency in Buildings in Armenia" (2010-2016), a component aims at achieving the design and enforcement of energy efficiency building codes and/or standards for new buildings. This project has resulted in legal reform in housing legislation, including various upcoming legislative amendments to the law "On energy saving and renewable energy", the law "On urban development", and the law "On developing the smaller centre of Yerevan". In addition, standards for new buildings were successfully developed including National Standard AST 362-2013 "Energy efficiency. Building energy passport. Main provisions. Typical forms" (enacted 1 January 2014), and Standard N40-V enacted on 1 November 2014, a direct result of UNDP's project[26]. This project has reinforced UNDP's working relationship with key stakeholders in the national, regional and municipal building sectors, and provides a solid platform for the GCF project. UNDP's approach to supporting legislation has been proven to be effective. Noting that the number of existing buildings far exceeds the number of buildings being constructed, the potential for energy use reduction in existing buildings is much larger than the potential in new buildings. It is, however, much more complicated to create an enabling environment for large-scale EE retrofits than it is to implement higher standards in building construction.

Activities will include:

2.2.1 Support to national, sub-national and local authorities to adopt and implement an enabling policy framework for energy efficiency retrofits. In view of the recommendations developed in Activity 2.1.1, and if needed, support will be provided for the adoption of additional by-laws applicable to building retrofits. Adoption and enforcement of the new Building Code to building retrofits will be ensured.

2.2.2 Support to the gradual introduction, according to an explicit and transparent timetable, of binding legislation on energy auditing, energy passports/certificates and labelling for existing buildings.

2.2.3. Support to the introduction of legislation specific to public buildings' energy efficiency retrofits, including required amendments in the public procurement rules.

[26] In addition to the legislative results of the UNDP-GEF project, other results include construction of an energy efficient 3-story social building of 950 m2 in the city of Goris (resulting in 60% energy savings over the baseline), renovation of an apartment building in Avan district of Yerevan with 58% savings, work with the Al Hamra Real Estate Armenia LLC in a new residential complex in Yerevan leading to energy savings over baseline of 35%, ongoing design of the first LEED-certified building in Aremnia (in the Malatia-Sebastia district of Yerevan) with 30% savings. A laboratory for testing thermal and physical characteristics of construction materials has also been created.

Output 2.3 Support provided for the creation of an enabling policy framework for energy efficiency retrofits in multi-owner residential buildings: Home Owner Association (HOA) legal status, payment enforcement, professional management, consensus levels

The project will support the development, introduction and enforcement of adequate secondary legislation to provide a clear and effective set of functional models and a standard set of rules for multi-owner building management bodies to undertake energy efficiency retrofits.

Activities will include:

2.3.1 Support to policy-makers in developing policy relating to HOA legal status, payment enforcement, professional management and consensus levels:

- Support the establishment of a proper regulatory system (including secondary legislation) to address multi-family buildings. This will include establishing mechanisms for enforcement via "carrots" and "sticks"[27].
- Consensus levels to be made consistent with international best practices.
- Ensure all multi-owner buildings have HOAs that collect appropriate minimum payments from owners and enforce sufficiently clear, timely and effective mechanisms to enforce payment discipline.
- Introduction of a mechanism to assist poor households in covering payment obligations for the improvement (and, in some cases, ongoing maintenance) of buildings.
- Work with municipalities and Housing Management Companies (HMCs) to carry out awareness campaigns to encourage – and, where necessary, require – the engagement of professional building management services.

Output 2.4 Support provided to building owners / managers / owner associations / ESCOs on legal matters related to energy efficiency retrofit projects

The absence of business models for repayment of energy efficiency investments is considered the major barrier to private sector investment in energy efficiency retrofits in the public and residential sectors. The project will roll-out aggregative models for energy efficiency retrofits through the private sector, such as through ESCOs and through innovative legal structures for owner associations in multi-owner buildings. Private sector entities or PPPs (such as ESCOs) will be supported in establishing robust repayment schemes for their services (through, for example, legal and financial advice on structuring EPCs with building owners/owners' associations).

The main Activities under this Output will be:

2.4.1 Provide support on legal matters related to energy efficiency retrofit projects for multi-owner buildings:

- Collective decision-making processes.
- Clarification of ownership and responsibility for all parts of the building, including commonly-owned areas.
- Business models and payment mechanisms.
- Available solutions for helping poorer households to pay for energy efficiency retrofits.
- How to deal with absentee owners and empty apartments.

For HOAs specifically, the following legal and mediation support will be provided:

- Support municipalities in setting up resource centres for information provision on starting/managing an HOA.
- Work with municipalities and HMCs to motivate existing and functioning HOAs to take decisions regarding investments and loans via awareness-raising, education activities and technical analysis of potential investments.
- For large investments, work with HMCs to support HOAs in identifying their investment requirements through consultations and the preparation of Energy Audits, and/or Rational Energy Utilisation Plans, and/or Energy Performance Assessments, and/or Energy Performance Certificates.

[27] A stick could include setting up a mandatory payment scheme for all apartment owners to be administrated by a municipality. A carrot could include government support for HOAs (with conditions that they would have to prove 3 months or more of payment discipline to a combined bank account).

- Assist in preparing building-level projects based on standard requirements for Conceptual Design documentation of each eligible building-level measure.
- Answer information requests and provide technical advice to prospective HOAs.
- Encourage HMCs and installers/suppliers who can act as facilitators for connecting HOAs with lending products to involve women.

2.4.2 Provide support for establishing ESCOs: Current energy efficiency legislation does not fully support the ESCO modality and there are no fully operating energy service companies in Armenia[28]. An example of an ESCO-type arrangement that is currently being set up in Yerevan with UNDP support is the special account (fund) that will receive funds from savings generated by investments in energy efficiency lighting improvements and will use these funds for further target financing of new energy efficiency projects. Lessons will be learned from the operation of this fund, and the possibility of setting up a similar fund for energy efficiency building retrofits will be examined. Ultimately, the project aims to introduce the ESCO model, where appropriate, to Armenia in partnership with existing building sector stakeholders, public and private companies providing energy efficiency services and/or building management services.

Output 2.5 Exit strategy measures implemented

The GCF project will overcome systemic barriers to energy efficient retrofits of public and residential buildings in Armenia and this catalyse impacts beyond the end of GCF's funding. The approach taken of policy and financial de-risking will provide a lasting impact and lies at the heart of the project's exit strategy as outlined in section 4.4 (section D.2. of the GCF Funding Proposal). Furthermore, the financial incentives for public buildings are to address first-mover barriers, but since investments in energy retrofits in public buildings are generally already financially viable further incentives are not likely to be needed. On the other hand for residential buildings where financial viability is not the main driver of building renovation, and where household poverty is a significant barrier, ongoing funding, targeted at poor households is likely to be needed beyond the end of the project. The strategy of working via the existing social support mechanisms aims to ensure that ownership of this support shifts to internal Armenian social security funding.

All these core elements supporting long-term sustainability have been built into the project design. Nevertheless, since the duration of the project is 6 years and not all needs can be fully anticipated at this stage, this output has been included to take into account any remaining needs for the creation of a sustainable market.

The Activity that will contribute to achieving this Output is:

2.5.1: Development and implementation of the exit strategy: Arrangements providing for long-term and financially sustainable continuation of project outcomes and results beyond completion of the project will be identified, discussed with stakeholders and implemented before the end of the project's lifetime. Components 1 and 2 of the project are designed to have a lasting impact by overcoming the existing barriers to investment in energy efficiency retrofits in buildings in Armenia. During project implementation, Components 3 and 4 offer additional financial de-risking and financial incentives. It is expected that private and public sector financing will be attracted to the sector as a result of the implementation of these de-risking instruments, resulting in the development of a market for energy efficiency building retrofits in Armenia. As a Government institution, the project's Executing Entity – the Ministry of Nature Protection of Armenia – will remain involved in the sector. An analysis of the remaining needs for financial de-risking and financial incentives beyond the scope of the project will be performed and recommendations made for how this need might be met. For residential buildings, where the incentive will be targeted at vulnerable households, the project will likely work through the existing Family Benefit Scheme of the Republic of Armenia. By following this approach, the project will demonstrate how the funding that the Government currently uses to compensate vulnerable households against past energy price increases can be redirected to energy savings. To close the loop, the policy de-risking activities will aim to establish sustainable Government funding wherever such incentives will

[28] *Final Report: Energy Efficiency Orbits for Transition Economies*, Prepared for: Copenhagen Centre on Energy Efficiency (C2E2), 2015.

continue to be needed as a long-term way to address the needs of households living in poverty

This activity will build on the policy and legislative work of Output 2.2 to create, where necessary, local incentives to stimulate high efficiency building retrofits after the end of the project.

Component 3 – Financial de-risking

The financial de-risking component will work in partnership with the EIB, the R2E2 Fund, local commercial (private sector) banks, and other relevant national and international financial institutions to provide access to affordable capital for energy efficiency retrofits. These de-risking instruments will take several forms, including credit lines from financial institutions and/or loan guarantees to stimulate local commercial banks to lend to private ESCOs and/or building owners. Where existing lending rates are prohibitive (current commercial lending rates are around 22% per year, with repayment periods of 5 years), such loans may be at concessional rates. UNDP has undertaken regular discussions with the EIB on the provision of soft loans for public and residential energy efficiency retrofits; the EIB is negotiating with the Government on provision of soft loans. The EIB and Government agreements will form the basis of provision of commercial loans by EIB for energy efficiency building retrofits in Armenia (commercial terms to be agreed during project implementation based on prevailing market conditions and needs). For these loans to be taken up successfully, GCF finance for the other Outputs and Components of the project is critical. In this Component, technical assistance will also be supplied to local commercial banks to develop their products, appraise investments and develop a pipeline of projects. Finally, information will be disseminated to market stakeholders on the availability of energy efficiency building retrofit finance packages on a project website. Building retrofits will be performed by competitively-selected private sector engineering companies. Activities will be implemented / supported by private sector consulting companies and individual experts.

The desired outcome of Component 3 is Outcome 3: Access to affordable capital for energy efficiency retrofits provided.

The Outputs that will contribute to achieving this Outcome are described below.

Output 3.1 Technical assistance provided to banks and other financial institutions for market facilitation for individual residences

The Activity that will contribute to achieving this Output is:

3.1.1 Provide support to banks to develop and market products for energy efficiency in individual residences. This will include training and knowledge transfer for banks on appraising investments (including risk assessment) and developing a pipeline of projects. The project will require banks to include female professionals in training on appraising investments (including risk assessment) and developing pipeline projects. The project will also encourage the identification and invitation of women heads of HOAs, or members, to be involved in developing lending products.

Output 3.2 Technical assistance provided to banks for HOA market facilitation

Since there is no real market for lending to HOAs in Armenia, technical support will be offered for establishing standard operating procedures for banks' introduction of credit offerings for multi-owner buildings, and an in-depth package of support will be provided for developing lending products for HOAs. The project will also work with Housing Management Companies (HMCs) and installers/suppliers who can act as facilitators for connecting HOAs with lending products. The focus will be on developing lending to existing HOAs and not on developing new HOAs.

Activities that will contribute to achieving this Output are:

3.2.1 Support to development of bank products for HOAs:

- Demonstrating to senior management the market potential for investment – including demonstrating what similar banks are doing in EU countries.
- Providing technical assistance in developing the products.
- Site visits to places where such lending is taking place.
- Liaison with those organisations that can undertake direct outreach to HOAs (e.g. HMCs and suppliers/installers of technologies).

- Assistance in understanding the legislative and regulatory framework related to lending to HOAs.

Output 3.3 Technical assistance provided to local government to develop energy efficiency retrofit projects for publicly-owned buildings

Activity that will contribute to achieving this Output is:

3.3.1 Support to the process of identification, development and aggregation of technically- and financially-feasible energy efficiency retrofit projects in publicly-owned buildings. Since energy costs constitute a large share of annual expenses incurred by public buildings[29], those managing such buildings will be strongly motivated to invest in energy efficiency retrofits given information on the technical possibilities and financing options.

The model for the mechanism that will support such projects is the special purpose fund for improving energy efficiency of lighting systems in Yerevan city Municipality. This fund is being set up as one of the outputs of the UNDP-GEF "Green Urban Lighting" project.

Across the project as a whole, extensive energy savings will be achieved. It is, however, worth noting that, in view of the extreme fuel poverty currently existing in some cases (some schools maintain indoor temperatures below 8ºC in winter), the improvement of energy efficiency in such buildings will result in increased comfort levels of the occupants of such buildings but may not necessarily lead to a reduction in energy use, as energy use will be maintained at previous levels but will result in more acceptable indoor temperatures being maintained. This effect, which is the result of what is termed 'suppressed demand', has been dealt with in climate change mitigation projects such as CDM projects. CDM guidelines recognise that in cases in which prior to the implementation of the project the energy services being provided to end-users were too low to meet basic human needs, a baseline can be constructed in which future emissions are projected to rise above current levels[30].

Output 3.4 Access to affordable capital for energy efficiency retrofits provided

GCF funding for the other Outputs and Components will be critical in terms of the needed technical assistance and capacity building for the financial institutions to step in and the loans to be successfully taken up. UNDP will partner with national and international financial institutions, which may then, in turn, offer financial de-risking instruments such as credit lines, loan guarantees and public equity for investments in EE building retrofits to local financial institutions such as banks and credit organizations.

To be clear, a GCF contribution in the form of loans, equity or guarantees is not being requested for these financial de-risking instruments. Instead, these financial de-risking instruments will be wholly funded by UNDP's partner financial institutions as co-financing.

Activities will include:

3.4.1 Establishment and maintenance of the technical structure for the financial de-risking instruments offered. This will include:

- Validate the technical parameters of the de-risking instruments, including technologies, eligibility requirements and criteria for selection.
- Update the technical parameters regularly to ensure that they are clear, unambiguous and ambitious.
- Develop, update and maintain standard templates, forms and lists to allow for streamlined investment processes.
- Development of simple models and brochures for banks to present to customers outlining the typical costs and savings associated with energy efficiency investments.
- Draft an operations manual for bank personnel involved in implementation.

[29] The C2E2 report referred to in footnote 9, p. 47, states that: "In a survey of educational, municipal, and healthcare buildings, 35% of those surveyed admitted that electricity bills amount to 11-20% of their total annual spending. Electricity costs were particularly high for educational buildings, where 38% of respondents reported their electricity bills at 11-20% of the total annual spending, whereas 27% of respondents reported the share of electricity costs above 20%. Many schools close down in winter, because they cannot provide adequate space heating. When they do operate, they often maintain indoor air temperatures way below adequate levels." Schools often operate at less than 8 ºC.

[30] UNFCCC CDM - Executive Board, 2012, EB 68 Report Annex 2 "Guidelines on the Consideration of Suppressed Demand in CDM Methodologies (Version 02.0)".

3.4.2 Verification of funded investments. This will include:

- Carry out a desk-based verification of investment proposals. Confirm eligibility of technology / installers, reasonable, market-level costs and justifiable technology, delivery and installation.
- Carry out spot checks of selected investments before, during and after investment, as needed.

Output 3.5 Marketing platform created

Develop marketing materials and a common brand / market platform on the advantages of energy efficiency retrofits, including publicising the results and the availability of energy efficiency building retrofit finance packages.

The Activity that will contribute to achieving this Output is:

3.5.1 Provide marketing support to banks (including SEF International, ACBA Bank, Ameria, Byblos Bank, Ararat Bank, and Ineco Bank[31]):

- Support the banks' marketing activities and enhance their broad implementation.
- In coordination with banks, develop and produce marketing materials (flyers, ad banners, brochures, etc.).
- In cooperation with the banks' staff, produce a 'Handbook on Financing Residential Energy Efficiency Investments' for the bank to incorporate in its lending procedures.
- Assistance to banks in making their voice heard as stakeholders in the process of regulatory reform.

Component 4 – Financial incentives

Targeted financial incentives will be provided and offered to building / apartment owners, or the ESCOs serving these clients, to ensure that the most vulnerable households can afford the costs of energy efficiency retrofits. The financial analysis (Annex 16) shows that, for those earning less than the median household income of US$ 400 per month, building retrofits are not affordable. Despite the fact that, ultimately, the retrofits will reduce energy bills, such households will not be able to afford the upfront costs of energy efficiency retrofits and, therefore, targeted incentives to vulnerable groups are required to help address the affordability gap and stimulate the demand for these retrofits. Such incentives are common even in developed countries – both in the EU and in the USA, sizeable grants are common practice. The Project will support poor and vulnerable households to allow them access to improved thermal comfort and cost / energy savings.

Considering the two sectors that will be addressed in this Project, the following approach will be taken for each:

- For public buildings, the ex-post capital grant paid to the relevant municipality or ESCO will be most appropriate. Systemic de-risking through the Project – components 1 to 3 – will permanently remove the market barriers, resulting in ongoing post-project market growth without incentives
- For the residential sector, the incentives will be targeted at low-income households, so a different approach has been proposed. Due to widespread poverty and inequality prevalent across urban areas in Armenia, at least one-fifth of households cannot afford to keep adequately warm at reasonable cost, given their income[32]. Recognising this, the Government of Armenia has used its main social safety net programme, the Family Benefit Scheme, to provide compensation to vulnerable households against past energy price increases. The scheme uses a scoring system for household vulnerability and allocates state family benefits via Social Service Centres in each region/district. The project's approach will be to use these existing Armenian social support schemes to provide the incentives directly to vulnerable households. The incentives would be paid after verification of results for each loan, following

[31] There are 6 local banks in Armenia that already offer financing for EE projects in collaboration with various IFIs (outside of the building sector), namely SEF International, ACBA Bank, Ameria, Byblos Bank, Ararat Bank and Ineco Bank. These banks will be the first ones to be targeted to receive technical assistance from the project for design of EE financing products for the residential building sector. Other interested banks, including from the list of EIB's financial intermediaries in Armenia, will also be invited through the open call for expression of interest.

[32] World Bank (2012), Poverty and Distribution Impact of Gas Price Hike in Armenia: https://openknowledge.worldbank.org/bitstream/handle/10986/11988/WPS6150.pdf?sequence=1

approval, in-principal, at the time the loan is given. Local private sector commercial banks will participate in this activity, and local engineering companies will provide services. Activities will be supported by private sector consulting companies and individual experts.

- The selection criteria for allocation of incentives will be those already established by the Law on Social Protection. The municipality will be responsible for applying those criteria to identify eligible recipients of the GCF-funded incentives. Final approval of the list of eligible households will be made by the Project Board based on proposal received from the municipality.

The desired outcome of Component 4 is Outcome 4: Affordability of energy efficiency retrofits for most vulnerable households ensured through targeted financial incentives to building/ apartment owners / ESCOs.

The Outputs that will contribute to achieving this Outcome are described below.

Output 4.1 Targeted financial incentives provided to vulnerable groups to help address the affordability gap

The Activity that will contribute to achieving this Output is:

4.1.1 Targeted financial incentives provided to building / apartment owners, or the ESCOs serving these clients. The incentives will initially come from GCF, but during the course of the project, as a result of the policy work under output 2.1, will increasingly be replaced by local incentives.

The project will include a focus on ensuring that female-headed households have equal access to affordable capital, and will provide technical and administrative support to facilitate access and also coordinate in identifying legitimate target households. The project will monitor improvements through socio-economic impact assessment data collection.

The delivery scheme and related operational guidelines for the incentives will be finalized during the inception period. The GCF Funding Proposal[33] will be used as the basis for the delivery scheme and guidelines, including the approach to the verification of results and ex-post administration of incentives.

2.3. Financial Elements of the Project

2.3.1. Financing structure

The table below describes the financial structure of the project.

Proposed financial structure

Component	Financiers	Required financing (MUSD)
	GCF	14.000
	Yerevan Municipality	8.000
	Sub-total	22.000
	GCF	6.000
	UNDP	1.420
	MoNP	0.400
	Sub-total	7.820
Total Project Cost		29.820

Currency Hedging Mechanism: UNDP's currency hedging mechanism is based on matching cash flows (i.e. revenues and expenses) in non-US$ currencies and bank account balances are targeted not to exceed approximately one month's disbursement requirements to minimise risk.

[33] http://www.greenclimate.fund/documents/20182/226888/GCF_B.13_16_Add.02_-_Funding_proposal_package_for_FP010.pdf/9e2c673e-1eef-4ff3-9609-d23a49c6d190

2.3.2. Description of how the choice of financial instrument will overcome barriers, achieve project objectives and leverage of additional public and/or private finance

The Project will leverage a sizeable volume of additional resources. To maximize this potential, UNDP is working closely with the EIB on securing concessional loan for public and residential sector, and through its partnership with the EIB, the involvement of private sector actors, and funding from the Government and UNDP. Overall, US$ 20 million of GCF financing is expected to leverage US$ 80 million of private investment and US$ 20 million of public investment in energy efficiency retrofits.

For technical assistance (Components 1, 2 and 3, and for Project Management) the requested GCF funding is US$ 6 million to remove market and policy barriers to EE building retrofits, and the co-financing will be provided by the Ministry of Nature Protection in the amount of US$ 0.4 million and the accredited entity, UNDP - US$ 1.42 million.

For investment (Component 4), GCF financing in the amount of US$ 14 million is being requested to address the needs of vulnerable households and remove financial barriers by making loans for EE building retrofits more affordable.[34] This will be complemented by US$8 million in co-financing from the Municipality of Yerevan.

In Component 4, grants from the GCF will be given as a temporary targeted incentive. The grants will be targeted in that they will address the needs of the most vulnerable households. The financial analysis (Annex 16) shows that, for those earning below the median household income of US$400 per month, building retrofits are not affordable. For middle- and higher-income households, grants are not needed from an affordability point of view and will only be used at a low level to overcome early-mover barriers. The grants will support poor and vulnerable households to allow them access to improved thermal comfort and cost / energy savings. Incentive grants for low-income households are also needed to unlock building-level investments, as these households might otherwise block building-level investment decisions in multi-apartment buildings. A total of US$ 12.5 million in incentive grants will be used to support vulnerable households in the residential sector.

In the public sector, a small incentive (totalling around US$ 1.5 million) is needed to provide necessary stimulus to support higher energy efficiency standards than required under ‘business as usual’. Also, the market and lending will likely increase much more rapidly with a small grant (up to 5% of investment cost) to incentivise first movers amongst municipalities. The funds will be applied as a grant towards the financing of measure alongside potential lending from EIB and cash investment from the municipality. In addition, the modest incentive will also serve to accelerate the renovation of buildings, thus improving the quality of life of households using public facilities such as hospitals and kindergartens servicing the population.

[34] The US$ 20 million GCF budget total includes project management costs but excludes the fee of the GCF Accredited Entity (see Section B.3). While not included in this proposal on the instructions by the GCF Secretariat, an additional cost of 9% of the value of the GCF project budget will be necessary to cover quality assurance and oversight services performed by UNDP as a GCF Accredited Entity over all phases of the project cycle. This includes: (i) oversight of proposal development; (ii) appraisal (pre- and final) and oversight of project start-up; (iii) supervision and oversight of project implementation; and (iv) oversee project closure. UNDP awaits confirmation from the GCF Board on this matter and expects that the AE fee, over and above the project cost, will be approved by the GCF Board prior to implementation.

3. RESULTS AND PARTNERSHIPS

3.1. Expected results

The Project will achieve high GHG emission reductions from improved energy efficiency and lower energy-intensity buildings. Based on experience and evidence from energy audits of UNDP's pilot project in Yerevan[35], up to 60% of energy consumption / GHG emissions in buildings can be reduced cost-effectively:

- Total tonnes of direct CO_2eq reduced per annum: an estimated 69,484 tCO_2 per year or 1.4 million tCO_2 over the 20-year lifetime of the energy efficiency interventions.
- Including direct and estimated indirect emission savings, a total of 5.6 to 5.8 million tCO_2 over the 20-year lifetime of the energy efficiency interventions will be achieved.
- Expected total number of direct beneficiaries: 210,000.

The overall impacts of the GCF project have been estimated using the data from the technical and financial analysis (presented in section 4.5 and Annex 16. The overall impacts are summarised in the Table 2. below.

Table 2. The Project impacts summary

Building type	Average cost per retrofit (US$)	Average level of grant (%)	Energy savings (GWh/ year)	GHG savings (tCO_{2eq} / year)	Number of buildings	Total amount of grant (US$)	Total investment (US$)	Lifetime GHG savings (CO_{2eq}, 20 years)
Single-family individual buildings	10,000	9%	110.3	27,239	6,000	5,400,000	60,000,000	544,783
Multi-family apartment buildings	120,000	22%	93.1	22,997	290	7,656,000	34,800,000	459,942
Public buildings (large, such as hospitals)	250,000	5%	7.7	5,005	23	287,500	5,750,000	100,093
Public buildings (small, such as schools)	95,000	8%	53.2	14,243	150	1,140,000	14,250,000	284,860
Total			**264.3**	**69,484**	**6,463**	**14,483,500**	**114,800,000**	**1,389,677**

3.1.1. Methodology used for calculating the indicators

Expected tonnes of carbon dioxide equivalent (tCO_2 eq) to be reduced or avoided

A detailed bottom-up analysis of model buildings in Armenia has been conducted. Four models have been developed, two in the residential sector (one for an individual single-family house and one for a multi-family apartment building) and two in the public sector (a hospital and a school). Building parameters and energy characteristics were determined for each type of building. A set of efficiency measures was then applied and the energy needs and potential savings for these measures calculated. Total energy savings were estimated taking into account a rebound factor. Using the model buildings as a guide to potential energy and GHG reductions, the estimated total emission reductions from the project investments were calculated. The GHG emissions analysis makes use of the Global Environment Facility (GEF) methodology for energy efficiency projects[36]. GHG emission coefficients

[35] In 2013-2014, UNDP, with GEF financial support, implemented the first large-scale thermal modernization project in the Republic of Armenia in a typical panel multi-apartment residential building in Yerevan. Full results of the project, including technical, economic and environmental feasibility, are presented in Annex 16 to this proposal. In addition, the results of a social survey of the residents are available in 'Energy Audit in the multi-apartment building #2 Mush-2 district, Gyumri, Republic of Armenia (2012) by Artur Tsughunyan and Tigran Sekoyan).

[36] See https://www.thegef.org/gef/pubs/STAP/Methodology-for-Calculating-GHG-Benefits-of-GEF-Energy-Efficiency-Projects-v.1 under "Financial Instruments"

were taken from the GEF GHG calculation worksheets for natural gas and electricity (data for Armenia).[37] For electricity, the grid emission factor for Armenia, given in the GEF worksheets, is taken from the IGES database[38] and is based on the CDM combined margin approach. Total direct emission reductions are the sum of the reductions achieved in the four building categories evaluated.

The project will undertake a number of activities beyond simple investments that will also stimulate the market for energy efficiency in the residential and public building sectors. Therefore, there will be indirect energy savings triggered by investments not within the direct control of the project. These are estimated using bottom-up and top-down approaches based on the GEF methodology. For bottom-up emission estimates, the estimated direct reductions are multiplied by a replication factor – with the expectation that the volume of investments and GHG emissions reductions will increase by a factor of 3 over a 10-year period after project completion due to the project intervention. This is a modest replication factor according to GEF practice. To estimate the indirect GHG emission reductions using a top-down methodology, total 10-year market size was estimated.

A detailed description of the methodology used to calculate the expected tCO_{2eq} reduction is provided in Annex 18.

3.1.2. Expected total number of direct and indirect beneficiaries (reduced vulnerability or increased resilience)

Direct beneficiaries of the project (who continue to benefit after the project for the lifetime of the investments) are calculated using an average household size of 5, and an average number of dwellings per apartment building of 36[39]. For public buildings, beneficiaries are taken as the average number of permanent building residents. For a hospital, this is the hospital staff, not the number of short-term users (patients).

Jobs created by the project are based on data in Ürge-Vorsatz et al. (2010): Employment Impacts of a Large-Scale Deep Building Energy Retrofit Programme in Hungary[40]. This detailed study takes into account jobs created in the construction sector, from the supply chain and from additional spending of additional disposable income as a result of financial savings. It also accounts for job losses in the energy supply sector resulting from reduced energy demand. The study finds that, on average, 17 jobs are created per million Euros invested (approximately 15 jobs per million US$). This employment factor is used here to estimate the number of jobs created as a result of the investments facilitated by the project. In order for the job creation to be sustained, there is an implicit assumption that lending will continue at the same rate in the future. If the retrofit investment market were to shrink after the project comes to an end, many of the jobs created would be lost.

The detailed numbers are shown in Annex 16.

3.1.3. Expected contributions to global low-carbon and/or climate-resilient development pathways through a theory of change for scaling up and replication

The paradigm shift potential for the proposed project lies in the project's focus on the private sector as the driving force for investment and implementation of energy efficiency retrofits, as opposed to current models which are primarily based on (scarce) public finance and lack repayment mechanisms (i.e. accumulated energy savings are not monetised and stay with building owners). The project will lead to a paradigm shift in the perception of investment in energy efficiency retrofits by investors, which are currently viewed as too risky and unattractive for private sector.

The theory of change for the project is illustrated in Annex 17. The project's results chain is based on UNDP's approach to market transformation for energy efficiency. This approach is based on the fact that, due to the high upfront capital intensity of energy efficient investments, access to large quantities of low-cost financing is critical to cost-effectively transform energy efficient markets. The main elements of the theory of change are support to governments to put together public instrument packages that: (i)

[37] see https://www.thegef.org/gef/pubs/STAP/Methodology-for-Calculating-GHG-Benefits-of-GEF-Energy-Efficiency-Projects-v.1 under "Financial Instruments"

[38] To be found at http://pub.iges.or.jp/modules/envirolib/view.php?docid=2136

[39] These assumptions are based on the characteristics of the pilot building in Yerevan, which is a typical multi-apartment residential building in Armenia (i.e, there are 4,300 similar buildings across the country).

[40] http://zbr.kormany.hu/download/8/82/00000/Study%20Deep%20Building%20Energy%20Retrofit%20Prog.pdf

address the non-financial barriers that block demand for investment; and (ii) create attractive risk-return profiles by reducing, transferring or compensating for risk.

Activity-specific sub-criteria and assessment factors:

Innovation - Opportunities for targeting new market segments. Project Outputs 2.3, 2.4 and 3.2 will create the enabling policy framework for energy efficiency retrofits in multi-owner residential buildings, provide technical assistance to banks to enable them to finance energy efficiency retrofits in such buildings, and support HOAs in accessing such finance. This will create a market for energy efficiency retrofits in the market segment of multi-owner buildings in Armenia, a market which is non-existent at the moment

Innovation - Opportunities for adopting new business models. The project will encourage the development of an enabling environment for ESCOs in Armenia and, in Output 2.4, includes activities that will provide support to establishing ESCO models based on Energy Performance Contracting (EPCs) for implementation of energy efficiency retrofits in multi-apartment residential buildings. Such models are currently only at an early stage of development in the country.

Level of contributions to global low-carbon development pathways: The buildings sector worldwide is a major energy consumer. As described in Section 1 (and in Section C.2 of the GCF Funding Proposal), GHG emissions from the building sector now represent 19% of global GHG emissions. Reduction of emissions from existing building stock will be an essential element of a global low-carbon development pathway, but there are numerous barriers to achieving such reductions. This project will provide a replicable, scalable model for the creation of an enabling environment for energy efficiency retrofits that will be particularly relevant for the transition economies of the former Soviet Union, in which there is huge potential for improvement of energy efficiency in the built environment[41].

Potential for expanding the scale and impact of the proposed project (scalability). A theory of change for scaling-up the scope and impact of the intended project without commensurately increasing the total costs of implementation. The project has the potential to be highly scalable: Armenia has approximately 4,300 panel buildings. Once a working model for financing retrofits of this type of buildings has been established and the skills for performing such retrofits have been built with direct support from the GCF project targeting an initial sub-set of 290 panel buildings, it will be relatively straightforward to scale-up the project to the rest of this market segment. The potential for energy savings from energy efficiency retrofits of this building stock is about 1,250 million kWh/year or 250,000 tCO_2/year. The leveraged investment ratio is expected to be US$ 20 for every US$ 1 invested by the GCF (see GCF Funding Proposal Section E.6.2. for estimated scope and impacts induced by the project for each building category and the total leveraging ratio).

The project will undertake a number of activities beyond simple investments, which will stimulate the market for energy efficiency in the residential and public building sectors. Therefore, there will be indirect energy savings triggered by investments not within the direct control of the project. These are estimated using bottom-up and top-down approaches based on the GEF methodology. Indirect emission savings are estimated to be between 4.2-4.4 million tCO_2.

Replicability. A theory of change for replication of the proposed activities in the project. Replicability of the project is also high. Neighbouring countries have large numbers of similar buildings to those in Armenia as well as similar barriers and risks to energy efficiency investments and may benefit by learning from successful projects in Armenia.[42]

In summary, the potential to scale-up the project is incorporated into the project design: first, through the establishment of robust MRV for the building sector that will enable further investment decisions to be made on the basis of sound data; second, through supporting the creation of an enabling policy framework; and, third, through the establishment of a financial mechanism and a system for the provision of financial incentives to vulnerable households that can be expanded as needed. Beyond the direct project scale-up measures, the potential for replication is large – not just in Armenia.

[41] Centre for Energy Efficiency (2015), *Final Report: Energy Efficiency Orbits for Transition Economies* http://www.cenef.ru/file/Final%20Report_C2E2_CENEf_June2_2015.pdf

[42] See Centre for Energy Efficiency (2015), *Final Report: Energy Efficiency Orbits for Transition Economies* http://www.cenef.ru/file/Final%20Report_C2E2_CENEf_June2_2015.pdf for an overview of potential and barriers to energy efficiency in building sector in former Soviet economies.

3.1.4. Contribution to the creation of an enabling environment

The key to achieving a true paradigm shift is through the creation of an enabling market-based environment through policy, finance, technical / capacity de-risking and barrier removal.

Arrangements that provide for long-term and financially sustainable continuation of relevant outcomes and key relevant activities: The project will strengthen the institutional and regulatory systems relevant to energy efficiency retrofits in Armenia. It will do this through working with national, sub-national and local authorities towards the adoption and implementation of an enabling policy framework for energy efficiency retrofits. This will be supported by the development of an MRV framework that will provide data for planning of further investments. The capacity that will be built in Government and in financial institutions for encouraging and financing energy efficiency retrofits will enable the development of a market that will continue to exist beyond completion of the intervention.

Extent to which the project creates new markets: The market for energy efficiency building retrofits in Armenia is currently extremely limited. For multi-owner buildings and public buildings in particular, no financial products exist that can fund such investments. HOAs lack the knowledge to engage in such projects and ESCO models have not yet been applied in these sectors. The project will create a functioning market for the different sub-segments of the buildings sector and create the market, which, once established, will develop further as a result of the improved risk environment for such investments that the project will create.

Degree to which the activity will change incentives for market participants by reducing costs and risks, eliminating barriers to the deployment of a low-carbon solution: project activities are designed to address the market barriers to energy efficient building renovation via a combination of policy and financial de-risking instruments and targeted financial incentives for key market players. By targeting the barriers, the project will reduce the overall investment risk profile of energy efficiency building retrofits and thus achieve a risk-return profile for energy efficiency building retrofits that will incentivise market participants to invest in such projects.

Degree to which the proposed activities help to overcome systematic barriers to low-carbon development to catalyse impact beyond the scope of the project: The project will systematically target the barriers and investment risks that currently result in a prohibitive overall investment risk profile of energy efficiency building retrofits in Armenia. The barriers (described in Section 1.2) fall under the general categories of policy, financial, market and technical / capacity barriers. The project is designed to ensure that each of these barrier categories will be eliminated or reduced as far as possible in Activities specifically designed for that purpose, resulting in the creation of a favourable market environment for investment in energy efficiency retrofits in buildings that will be sustained beyond the scope of the project.

3.1.5. Contribution to regulatory framework and policies

The project will provide technical assistance to strengthen existing policies and formulate secondary legislation that support energy efficiency building retrofits in different building sectors.

Under Component 1, which will introduce robust MRV, improved data for decision-makers will allow policy-makers to set priorities for energy efficiency programmes within the buildings sector. The existence of the MRV system will allow decision-makers to formulate policies and programmes based on actual consumption and performance data from the building sector.

Component 2 will support national and local authorities to adopt and implement an enabling policy framework for energy efficiency retrofits. This Component will support on-going legal reform in the field of energy efficiency, such as introduction of binding legislation on energy auditing, energy passports/certificates and labelling for existing buildings. Measures will include: the modernisation and enforcement of energy efficiency standards and mandatory energy performance standards for retrofitted buildings; the development, introduction and enforcement of adequate secondary legislation for providing a clear and effective set of functional models and rules for multi-apartment building management bodies to undertake energy efficiency retrofits; legislation that will assist the management of energy efficiency building retrofits for different types of building; and assistance to residents and common-share building organisations on collective decision-making in the context of energy efficiency retrofit investment.

3.1.6. Environmental, social and economic co-benefits, including gender-sensitive development impact

Delivering a large-scale retrofit initiative in the form of the proposed GCF project will deliver large and important development benefits whose impacts will increase over time as energy prices rise[43].

Economic co-benefits:

- Major economic savings (up to 5% of household incomes) due to reduced spending on energy and, as a result, reduction of energy (fuel) poverty among at least 5,000 households.
- Job creation through direct employment in retrofit activities, which would result in approximately 50,000 person-months of paid labour.
- Reduction in Government expenditures on energy (and improved budgetary position of national and sub-sovereign entities) and freeing-up Government budget to be reallocated to other important areas of expenditure such as education, healthcare or reinvestment in energy efficiency-related activities. Energy costs constitute a large share of annual expenses incurred by public buildings. In a survey of educational, municipal and healthcare buildings, 35% of those surveyed state that electricity bills amount to 11-20% of their total annual spending. Electricity costs are particularly high for educational buildings, where 27% of respondents report the share of electricity costs to be above 20%. In large public buildings such as hospitals, the total energy savings possible as a result of changing the heating system and better insulating the building is 43%, with an improvement in lighting electricity needs of 80%. In smaller public buildings such as schools, the total energy saving possible as a result of better insulating the building is 49%. This means that retrofits could potentially save public buildings 10% or more of their budget.[44]
- Government's budget deficits reduced.

Social and health co-benefits:

- Poverty reduction through reduced energy bills: over 30% of Armenian households are considered energy poor, where energy poverty is defined as households spending more than 10% of their budgets on energy.[45]
- Improved access to educational facilities with suitable thermal environments: currently, many schools close down during the winter because they cannot provide adequate space heating.
- Improved conditions for home-owners, including improved health due to reduced exposure to cold, improved indoor air quality and a healthier indoor environment from the absence of moulds. The World Health Organisation (WHO) estimates that, in 2012, 1,123 deaths in Armenia were attributable to household air pollution from solid fuel use.[46]
- Increase of the lifetime of the buildings;
- Creation of jobs in the construction sector (estimated as 1,700 – see Section 4.3 and Annex 16).

Environmental co-benefits:

- Improved air quality due to the reduction in use of solid fuel heating: In 2010, 19% of the population of Armenia still used solid fuels in the home (UN MDG Database[47]).
- Noise reduction due to sound insulation: this is beneficial in multi-family apartment buildings, where noise levels can be a major issue and can cause friction between neighbours.
- Reduced need for cooling in summer.

[43] Multiple socio-economic development benefits of energy efficiency are documents by IEA (2014), *Capturing the Multiple Benefits of Energy Efficiency*: http://www.iea.org/topics/energyefficiency/energyefficiencyiea/multiplebenefitsofenergyefficiency/ and Copenhagen Economics (2012), *Multiple Benefits of Investing in Energy Efficient Renovation of Buildings*: http://www.renovate-europe.eu/uploads/Multiple%20benefits%20of%20EE%20renovations%20in%20buildings%20-%20Full%20report%20and%20appendix.pdf

[44] Centre for Energy Efficiency (2015), *Final Report: Energy Efficiency Orbits for Transition Economies* http://www.cenef.ru/file/Final%20Report_C2E2_CENEf_June2_2015.pdf

[45] http://r2e2.am/wp-content/uploads/2013/09/SREP-09.16.pdf

[46] http://apps.who.int/gho/data/node.main.HAPBYCAUSEBYCOUNTRY?lang=en

[47] http://mdgs.un.org/unsd/mdg/Default.aspx

Gender-sensitive development impacts:

- Positive impact of energy efficiency retrofits on women through improved conditions in the home.[48]
- Improved access of women to investments on energy efficiency building retrofits and to information about building energy efficiency.
- Broader participation of women in opportunities: setting-up of building sector MRV, where users will be trained on data collection and analysis and use of EMIS; training and awareness-raising for commercial banks on performing due diligence of energy efficiency retrofit opportunities; development of energy performance standards and a mechanism for continuous update and systematic enforcement
- Out of the 82,200 residents of the single and multi-family buildings that will be directly impacted by the project, an estimated 6,000 people would be female-head of households and their dependents based on the 37% percentage of the female-headed households in 2010 (WB data)[49]. Out of the 128,000 users of public buildings, at least 90,000 will be women, reflecting the much higher share of female employment in the public sector. When targeting vulnerable households, the project will work with the main Armenian social safety net programme, the Family Benefit Scheme. The scheme already prioritizes vulnerable women, such as single mothers, in allocation of state support. Additional indicators and targets will be added to ensure equal access to financial incentives for women during implementation of Component 4.

3.2. Partnership and Stakeholder Engagement

3.2.1. Summary of stakeholder consultations

UNDP has established long-standing and on-going stakeholder consultations with a variety of stakeholders, including Government agencies, NGOs and other development agencies and potential project beneficiaries. Stakeholder consultations during the preparation of the project included one-on-one meetings. Government agencies have been made aware of, and have engaged in, on-going discussions regarding the energy efficiency building retrofit project through activities associated with UNDP's existing energy efficiency buildings and energy efficiency lighting project activities and the well-established UNDP Climate Change Programme Unit coordinated by and located at the Ministry of Nature Protection. Other Government agencies engaged regarding the energy efficiency retrofit project include the Ministry of Urban Development (currently Committee), the Ministry of Territorial Administration and Development, the Ministry of Economic Development and Investment, the National Institute of Standards, the R2E2 Fund, the Scientific Research Institute of Energy, and the Yerevan State University of Architecture and Construction.

Civil society organisations engaged with UNDP's on-going energy efficiency buildings project that were also consulted through one-on-one meetings included the Builders' Union of Armenia and the Architects' Union of Armenia, the Foundation to Save Energy, the Development Solutions Institute Foundation, Third Nature, the Habitat for Humanity Armenia foundation and the National Social Housing Association foundation. Informal discussions were also held with potential project beneficiaries identified through engagements with UNDP's on-going activities in Armenia.

3.2.2. Institutional framework

Table 3. Government agencies with an energy efficiency policy mandate

Ministry	Responsibility
National Government	Responsible for the enforcement of legislation, including energy saving and energy efficiency regulations
Ministry of Energy Infrastructure and Natural Resources	Addresses a wide range of strategic goals, including energy efficiency, through the implementation of national projects, programmes and drafting legislation.

[48] While Armenian women are highly educated, present in the workforce and active members of civil society, prevailing norms still dictate that they are primarily responsible for household duties and childcare. Time use studies confirm that women spent five times more time on housework or other unpaid work than men (almost 6 hours per day for women as opposed to under two hours for men). Petrosyan, Hrachya (2005) *Unpaid Work and gender inequality in Armenia*, Levy Economics Institute/ Bureau for Development Policy of UNDP, (2005), p. 4-5

[49] http://data.worldbank.org/data-catalog/gender-statistics

Ministry	Responsibility
State Urban Development Committee	Regulates construction activities, including insulation and building energy efficiency standards.
	Design and enforcement of building codes and standards
Ministry of Nature Protection	Coordinates climate change programmes in the country
National Statistical Service	Responsible for statistical information, including data on fuel and energy consumption, tariffs, buildings' floor space, etc.
National Institute of Standards of the Ministry of Economic Development and Investment	Licenses independent verifiers of certificates and labelling
Renewable Energy and Energy Efficiency Fund (R2E2 Fund)	The Fund was established in accordance with Government Resolution No.799-N dated April 28, 2005. The mission of the Fund is to facilitate investment in the energy sector. It provides comprehensive assistance to project developers, investors, banks, researchers etc. and provides expertise to the government on issues related to energy. The Fund has also established a revolving fund that finances energy projects through banks or through direct credit contracts.
Public Services Regulatory Commission	Regulates the energy market in Armenia and operates a number of programmes to encourage the effective use of energy resources.

3.2.3. Stakeholders and roles

The Government and private sector stakeholders are outlined in the Table below.

Table 4. Overview of project stakeholders and their proposed engagement in implementation

Stakeholder category	Name	Relevance to Project
	Ministry of Nature Protection	Implementing partner for the project and the NDA for the GCF. The Ministry is responsible for the coordination of all climate-related projects and programmes, as well as for monitoring of GHG emissions in line with its mandate.
	State Urban Development Committee, Government Adjunct Body	Recipient of technical assistance to develop and strengthen legislation and secondary legislation associated with energy efficiency buildings and retrofits. Also responsible for the design and enforcement of new building codes and standards, and coordination and supervision of construction/reconstruction of the residential buildings.
	State Urban Inspectorate under the State Urban Development Committee	Recipient of technical assistance to develop and strengthen legislation and secondary legislation associated with energy efficiency buildings and retrofits. In particular, the Inspectorate will benefit from assistance to strengthen its enforcement capabilities.
	Ministry of Energy Infrastructure and Natural Resources	Enforcement of the legal base, methodologies and procedures for the Energy Certification Scheme (Energy Passport).
	National Institute of Standards	Development of procedures for licensing of independent verifiers in the sphere of energy efficiency materials certification and labelling.
	Municipalities and sub-national entities	Provided with capacity strengthening in the area of land use planning and zoning, particularly regarding the integration of energy efficiency building considerations into local decision-making.
	Commercial Banks such as SEF International, ACBA Bank, Ameria, Byblos Bank, Ararat Bank, Ineco Bank	Recipients of technical assistance to develop financial packages for energy efficiency building retrofits. Will provide financing for energy efficiency building retrofits under various investment programmes.
	ESCOs	Recipients of technical assistance to develop financing packages and to develop a pipeline of bankable energy efficiency retrofit investment opportunities.
	Home-owners / managers / condominiums	Provide a down-payment on energy efficiency building retrofits and contribute to development of a pipeline of bankable energy efficiency retrofit investment opportunities.

Stakeholder category	Name	Relevance to Project
	Companies that will be involved in retrofit projects	Companies such as engineering design and construction companies, and suppliers of materials will be the ones actually executing the retrofit projects.
	Builders' Union of Armenia and Architects' Union of Armenia	Development of advertising materials, exhibitions, support with publications, lobbying for regulatory documents and standards adoption, awareness-raising.
	National Mortgage Company	Will provide financing for energy efficiency building retrofits under various investment programmes, particularly under loan agreement with KfW.
	Universities	Support lessons learning activities and conduct formal academic teaching.
	NGOs	Awareness-raising activities: A range of NGOs, including the Foundation to Save Energy, the Development Solutions Institute Foundation, Third Nature, the Green Union, the Habitat For Humanity Armenia foundation and the National Social Housing Association, which specialise in energy efficiency projects and the international NGOs, Altair (Humanitarian Centre), which specialises in improving living standards.
	Armenia Renewable Resources and Energy Efficiency Fund	The Fund is responsible for financing a number of renewable energy and energy efficiency projects and promoting the development of the energy efficiency market in Armenia.
	European Investment Bank (EIB)	Project partner and a source of co-finance
	World Bank	Coordination with existing project, "Armenia Energy Efficiency"
	USAID/EE Project	Exchange of data and analytical studies
	KfW, EBRD, UNECE	Exchange of data, analytical studies and coordinate awareness-raising activities

3.2.4. Stakeholder coordination

The primary means of stakeholder coordination will be via the Project Board (Board), which will provide an official, ongoing forum for coordinating the work of various Government agencies and other donors. In addition to work undertaken through the Board, project staff will maintain regular communication with the other agencies regarding their complementary work on energy efficiency building retrofits. See section 5. 'Implementation and institutional arrangements' for more details.

3.3. Mainstreaming gender

In 2011, standing committees on gender-related issues were created at the levels of regional administrations in Armenia (*Marzpetaran*) and in the 12 districts of Yerevan to assist in introducing gender policy in communities and in developing annual gender policy action plan.[50] With this initiative, the Municipality of Yerevan must have built the capacity in managing gender issues. The project will promote the collection of sex-aggregated baseline data to monitor the development impacts of energy efficiency projects.

MoNP is the Executing Entity of this project and will manage the project; the MoNP will work with the Ministry of Social Affairs and National Statistics to monitor gender issues relevant to energy efficiency projects.

Prior to implementation of building retrofit works, MoNP will collect available secondary data from past and ongoing energy efficiency projects in Armenia that can be used to establish baseline and in setting targets to address gender equality particularly on access to finance, training, and other benefits.

UNDP will conduct the monitoring and evaluation of project interventions, which will place special attention on gender impacts, and will report findings to the Project Board.

During project implementation, qualitative assessments will be conducted on the gender-specific benefits of the project. This will be incorporated in the annual Project Implementation Report, Interim

[50] UN Women. National Review of Armenia. http://www.unwomen.org/~/media/headquarters/attachments/sections/csw/59/national_reviews/armenia_review_beijing20.ashx?v=1&d=20140917T100717.

Independent Evaluation Report, and Final Independent Evaluation Report. Indicators to quantify the achievement of project objectives in relation to gender equality will include men and women who had access to affordable capital for energy efficiency retrofits, number of men and women who accesses the jobs generated by the project, and benefited from training opportunities, knowledge management and information dissemination. Women's associations and professional networks, among other, will be the project's key stakeholders.

See Annex 6 for the gender analysis and action plan.

3.4. Knowledge

The project will contribute to knowledge creation and sharing by all market players. To ensure that the strengthening of knowledge will be a focus throughout the project's life, the project includes an output, Output 1.2, which deals specifically with the existence and implementation of a plan for sharing lessons learned. In addition, the provision of technical assistance to the construction sector, Government (national and sub-national) and HOAs will result in collective learning in those target groups. Energy and financial savings information will be collected, analysed and disseminated via the project website and through various other channels and activities such as workshops and advertising.

The project will support the implementation of building Energy Management Information Systems (EMIS) in retrofitted buildings. The information gained from these systems will be disseminated, helping to establish the business case for energy efficiency building retrofits, inform better policy-making and providing information for national documents on climate change such as future National Communications to the UNFCCC.

The monitoring and evaluation plan is described in Section 7. The planned knowledge management activities, including the sharing of lessons learned, are described in Output 1.2.

4. FEASIBILITY

4.1. Cost-efficiency and effectiveness

The project's objective is to deploy an integrated suite of interventions to systematically de-carbonise the existing building stock to realise both GHG emission reductions and sustainable development benefits. Barriers to achieving this include policy, financial, market and technical / capacity barriers. Addressing the policy, market and technical / capacity barriers requires technical assistance, which is provided in Components 1, 2 and 3. In order to address the financial barriers, financing is needed – which is provided in Components 3 and 4.

The concessional loan, subject to EIB's due diligence, will be offered on terms that will not crowd-out private and other public investment. EIB follows the principles of the 'DFI Guidance for Using Investment Concessional Finance in Private Sector Operations'.[51] These principles are: additionality, crowding-in, commercial sustainability, reinforcing markets, and promoting high standards. Taken together, these principles affirm EIB's commitment to provide market-consistent support for commercially sustainable projects in situations where private investment is not forthcoming or requires supplementing.

In Component 4, grants from the GCF will be given as a temporary targeted incentive to address the needs of the most vulnerable households. The financial analysis (Annex 16) shows that, for those earning below the median household income of US$400, building retrofits are not affordable. For middle- and higher-income households, grants are not needed from an affordability point of view, and will only be used at a low level to overcome early-mover barriers. The grants will support poor and vulnerable households to allow them access to improved thermal comfort and cost / energy savings. Furthermore, incentives in the form of grants are common in developed countries – both in the EU and USA sizeable grants are common practice. KfW, for instance, provides loans together with incentive grants for energy efficiency retrofits in Germany of between 7.5-22.5%, and consequently the proposed incentive grants in Armenia can be considered modest.

In the public sector, a small incentive (totalling approximately US$ 1.5 million) is also justified based on the additionality that higher energy efficiency than 'business as usual' brings. This modest incentive will also serve to accelerate the renovation of buildings, thus improving the quality of life of citizens using public facilities such as hospitals and kindergartens.

The proposed project, by focusing on addressing systemic barriers to energy efficiency in existing housing – through policy and financial de-risking – represents an efficient and effective way to address Armenia's future GHG emissions and to meet the country's stated mitigation objectives as stated in the INDC and the sub-national targets set by cities. By providing incentivised financing, the project will also address first-mover costs and kick-start market-based refurbishment of existing housing stock. The effectiveness and efficiency of the proposed activities are characterised by the following key performance indicators:

Key performance indicator	Target
Estimated cost per tonne CO_{2eq} (total investment cost/expected lifetime direct emission reductions)	• US$ 22 / tCO_2e for total project financing • US$ 14.4 / tCO_2e for GCF financing
Estimated cost per tonne CO_{2eq} (total investment cost/expected lifetime direct and indirect emission reductions)	• US$ 5-6 / tCO_2e for total project financing • US$ 3.4-3.6 / tCO_2e for GCF financing

An appropriate benchmark for the total investment cost/expected lifetime direct emission reductions is provided by data from a recent report on energy efficiency retrofits in residential buildings in the Western Balkans.[52] For Albania, which has an electricity system with a grid emission factor similar to that of Armenia, the calculated cost per tonne of lifetime emission savings is between US$ 178-897/tCO_{2e}, depending on the type of building and the type of measures considered. For some CDM projects, data are available that have enabled calculation of the investment cost per tCO_2[53] and examples include those provided in the following table.

[51] http://www.ebrd.com/downloads/news/roundtable.pdf

[52] https://www.energy-community.org/portal/page/portal/ENC_HOME/CALENDAR/Other_Meetings/2015/03_Jun and https://www.energy-community.org/portal/page/portal/ENC_HOME/DOCS/3284024/Guidance_Note_on_Residential_Energy_Efficiency_programs.pdf

[53] CDM Pipeline, www.cdmpipeline.org

Project	Period over which emission reductions are counted (year)	Investment US$/tCO$_2$
Moldova Energy Conservation and Greenhouse Gases Emissions Reduction: This programme of 27 projects will improve efficiency and promote switching from coal/mazut to natural gas for heating public buildings	10	3,452
Massive introduction of Compact Fluorescent Lamps (CFLs) to Households in Ecuador	10	45
Energy Efficiency Measures in Office Building at Kalina of Ivory Property Trust (India)	10	250
Energy Efficiency Measures at MindSpace Building No 6 at Hyderabad	10	133
Energy Efficiency Measures at Terminal T3 (India)	7	1,002
Installation of Natural Gas-Based Combined Cooling, Heating and Power (CCHP) Systems in DLF Building 5 in Gurgaon, India	7	3,176
Energy Efficiency Measures at MindSpace Building No 9 at Hyderabad	10	82
Energy Efficiency Measures at MindSpace Building No 14 at Hyderabad	10	167

As can be seen, the cost per tCO$_2$e of building energy efficiency projects can vary widely (see also the sensitivity analysis in Annex 14). This cost will depend to a large extent on the measures to be implemented and on the carbon intensity of the local electricity grid. In the literature on energy efficiency, the cost presented is often the abatement cost, in which the energy cost savings are subtracted from the sum of investment and O&M cost. The abatement value for energy efficiency measures is often negative. This justifies the large difference between the direct emission reductions as a result of investments made in the project and the indirect emission reductions, which include investments that will be made due to the barrier removal and market creation by the project. Energy efficiency projects are justified by the fact that, although the direct cost of emission reductions may be relatively high, once existing barriers have been removed private and other public investment will follow that have the potential to lead to very large emission reductions.

4.2. Risk Management

Technical and operational risks include risks related to lack of knowledge and skills, and the under-developed nature of the ESCO market. Financial risks include those related to the level of energy prices and the availability of loans for energy efficiency investments. Social and environmental risks to the project are minor and summarized in Annex 5. An additional risk relates to the Government's commitment to adopt and implement legislation. The most significant risks are the financial risks. These will be mitigated through the creation of financial mechanisms as part of the project.

The risk rating for this project is provided in the UNDP Risk Log found in Annex 14. The overall risk rating for this project is Low. As per standard UNDP requirements, the Project Manager will monitor risks quarterly and report on the status of risks to the UNDP Country Office. The UNDP Country Office will record progress in the UNDP ATLAS risk log. Risks will be reported as critical when the impact and probability are high (i.e. when impact is rated as 5 and probability is 1,2,3,4, 5 or when impact is rated as 4 and probability is rated at 3 or higher). Management responses to critical risks will also be reported in the annual Project Implementation Report (PIR).

4.3. Social and Environmental Safeguards

The project will eliminate policy, financial, market and technical barriers to create an enabling environment for investments in energy-efficient building retrofits. The interventions from the technical assistance of the GCF are mainly capacity building. The $14 million investment by the GCF accounts for approximately 11% of the total investment cost ($122.82 million), or about 16% compared to EIB's potential parallel contribution of $86.25 million. Building retrofits may cause impacts such as generation of waste and safety risks to the community from installation and dismantling, but these are minimal, temporary and can be easily mitigated.

The overall outcome of the project will be reduction in energy consumption of the building sector, with associated reductions in GHG emissions and wider opportunities for gender mainstreaming in capacity building, financing and employment (about 1,700 jobs will be created).

The project has completed the UNDP social and environmental screening procedure (see SESP attached as Annex 5). This screening was undertaken to ensure this project complies with UNDP's Social and Environmental Standards. The overall social and environmental risk category for this project is: **Low**.

Given the type and scale of the interventions proposed by the project, no EIA is required by the Government (as confirmed in the Letter from the MoNP, dated 16 July 2015).

The UNDP SESP template used to classify the project follows the current best international practice (i.e. EBRD, EIB, ADB, WB, etc.), whereby similar projects (i.e. involving energy efficiency building retrofits) have been classified by IFIs as 'low-risk'. For example, this was the case for a recent €137 million EIB project in Romania ('Bucharest Thermal Rehabilitation', as well as the WB-GEF US$ 10.9 million grant for the Municipal Energy Efficiency Project in Armenia (approved in 2012). The EIB investment in Romania and the World Bank's project in Armenia funded identical technical measures to what are proposed under the current proposal: i.e. thermal rehabilitation of multi-storey residential and public buildings, including such physical interventions as insulation of walls, basements and attics, repair/replacement of external doors and windows, installation of reflective surfacing of walls behind radiators, replacement of boilers and heating systems. Consequently, the project has been assigned a 'low' category in UNDP's E&S Screening template based on consultation with the Government to ensure consistency in environmental and social assessments among project partners and similar initiatives in Armenia and elsewhere. However, the SESP recognises that categorisation of projects is an iterative process; should stakeholders raise concerns about the project's social and environmental aspects during implementation, the 'low risk' designation will be carefully reviewed.

Social and environmental complaints by communities and people affected by the project can be submitted to UNDP's Social and Environmental Compliance Unit (SECU). SECU will respond to claims that UNDP is not in compliance with applicable environmental and social policies. Complaints can be submitted by e-mail to project.concerns@undp.org or the UNDP website. Project-affected stakeholders can also request the UNDP Country Office for access to appropriate grievance resolution procedures for hearing and addressing project-related social and environmental complaints and disputes. Environmental and social grievances will be monitored and reported in the annual PIR.

4.4. Sustainability and Scaling Up

Long-term sustainability of the project is embedded in the project design, which aims at overcoming systemic barriers and creating market conditions for energy efficiency investment thus catalysing impacts beyond the end of the GCF funding. Sustainable market opportunities for energy efficiency investment will be created by:

- Addressing policy needs within Component 2: the legislative barriers to public and private sector investment will be addressed at national, sub-national and local authority levels, and technical and capacity barriers will be addressed.
- Addressing financing needs within Component 3: The project will put in place arrangements for long-term sustainable provision of affordable finance for energy efficiency building renovation, which matches the risk-return profile of such investment. It will do this by building the knowledge and experience of local banks and ESCOs.
- Catalysing initial investment through financial incentives provided under Component 4, which will serve to kick-start the market, addressing first-mover barriers at both local bank and borrower levels. By seeding a critical mass of investment, practical experience and know-how will be created, thus addressing these systemic barriers. For residential buildings, where the incentive will be targeted at vulnerable households, the project will work through the existing Family Benefit Scheme of the Republic of Armenia. By following this approach, the project will demonstrate how the funding that the Government currently uses to compensate vulnerable households against past energy price increases can be redirected to energy savings. To close the loop, the policy de-risking activities will aim to establish sustainable Government funding wherever such incentives will continue to be needed as a long-term way to address the needs of households living in poverty.

HACT assessments were conducted for the following two agencies:

- State Agency "Environmental Project Implementation Unit State Institution" at the Ministry of Nature Protection of the Republic of Armenia
- Yerevan Municipality.

These assessments were used to determine the adequacy of existing capacities to support National Implementation Modality (NIM) and where further support is required. Detailed finds are summarized in Annex 15.

Output 2.5 will take into account any remaining needs for the creation of a sustainable market and will put in place any necessary additional measures needed to ensure the market created will continue developing after the GCF intervention. These measures will be discussed with stakeholders and implemented before the end of the project's lifetime. Components 1 and 2 of the project are designed to have a lasting impact by overcoming the existing barriers to investment in energy efficiency retrofits in buildings in Armenia. During project implementation, Components 3 and 4 offer additional financial de-risking and financial incentives. It is expected that private and public sector financing will be attracted to the sector as a result of the implementation of these de-risking instruments, resulting in the development of a market for energy efficiency building retrofits in Armenia. As a Government institution, the project's Executing Entity – the Ministry of Nature Protection of Armenia – will remain involved in the sector.

4.5. Economic and/or Financial Analysis

The project will accelerate the market for energy efficient retrofits of buildings in: a) the residential sector, and b) the public sector. In the residential sector, two typical building models are considered: a single-family house and a multi-owner apartment building. In the public sector, two technical scenarios are considered for the same building: a retrofit with only demand-side (energy-saving) measures, and a retrofit with both demand- and supply-side (fuel-switch) measures.

Starting with the investment costs and modelled energy and financial savings, a bottom-up financial and economic model has been developed for each building-type. The fuel prices (for natural gas and electricity) are increased annually at a rate of 1% per year. This is a conservative figure: until recent public protests broke out, the Government's plan was for electricity prices to increase by 16% in 2015 alone. Investment parameters include own funds (10% for residential buildings and 20% for public building), an incentive grant and a loan, and sensitively analysis has been carried out for these parameters. The simple payback, internal rate of return (IRR) and net present value (NPV) are determined using standard financial modelling.

The choice of discount rate for the NPV calculations is guided by which party is being affected and what the time value of money is for that party.[54] The time value of money for a household varies considerably according to household members' perception of risk and the perception of likelihood of returns on the investment. There is a difference in investment in energy efficiency in the residential sector between individual households and multi-owner buildings. For investments in energy efficiency in Armenia at the building level in multi-owner buildings, the discount rate is higher due to factors such as lack of awareness amongst the owners, lack of access to financing, inertia in the decision-making process, perceptions that the building space outside of the apartment is not the owner's individual responsibility, coordination costs, absentee owners, and the perceived risk of free riders. This indicates that there should be a difference in the appropriate discount rate to be used in any financial modelling. The justification for using particular discount rates is provided below:

- **For households** (houses and dwellings within apartment buildings), the discount rate represents the opportunity cost of other investing options. As a proxy for this opportunity cost, the interest rate on savings deposits in Armenia is used (10.4% in 2014).[55] The discount rate used in calculations is 10%.
- **For residential building-level investments**, the discount rate chosen is 17.5%:
  - For building-level investments, the perception of risk is higher and the perception of likelihood of returns on the investment is lower. This is generally due to the perception that collective action may not succeed. Additionally, there is general inertia of apartment owners to invest together. This is demonstrated by the lack of investment at the apartment-building level in countries even where the legal framework is already conducive to collective decision-making (for example, Croatia, Serbia and Montenegro[56]).

[54] See discussions in, for example Woolf et al. (2012), Best Practices in Energy Efficiency Programme Screening: How to Ensure that the Value of Energy Efficiency is Properly Accounted For. Available at http://www.synapse-energy.com/sites/default/files/SynapseReport.2012-07.NHPC_.EE-Program-Screening.12-040.pdf

[55] See World Bank (2015) Data: Deposit interest rate (%) http://data.worldbank.org/indicator/FR.INR.DPST/countries

[56] World Bank (2014), *Western Balkans: Scaling-up Energy Efficiency in Buildings*: https://www.energy-

- This figure is consistent with that given in the EU analysis, 'Study evaluating the current energy efficiency policy framework in the EU and providing orientation on policy options for realising the cost-effective energy efficiency/saving potential until 2020 and beyond'[57], which uses 17.5%. This figure is also consistent with that used in the EU's PRIMES model for households[58]. While, clearly, perceptions of risk are far higher in Armenia than in the EU (as reflected by high interest rates on savings accounts, loans, etc.), this conservative figure has been used in the analysis.

- **For public buildings**, a discount rate of 10% is used.

The economic analysis takes into account increasing fuel prices, an increase in property values (for residential buildings), and an economic benefit of reduced GHG emissions valued at $25 per tonne of CO_{2eq} reduced.[59] A detailed financial and economic model has been prepared for each building-type (at the building level), and combined into an overall project-wide integrated financial model, which is available in Annex 16.

The US$20 million of GCF grants will be composed of funding used for technical assistance (Components 1, 2 and 3) to remove market and policy barriers to energy efficiency building retrofits; and for incentives (Component 4) to address the needs of vulnerable households by making loans for energy efficiency building retrofits more affordable. The technical assistance provided in Components 1, 2 and 3 are grant-funded since they address and remove systemic risks and overcome market barriers.

In Component 4, grants from the GCF will be given as a temporary targeted incentive focused on vulnerable households. The grants will support poor and vulnerable households to allow them access to improved thermal comfort and cost / energy savings. Incentives in the form of grants are common in developed countries – both in the EU and USA, sizeable grants are common practice.[60] In Germany, for instance, KfW provides loans together with incentive grants for energy efficiency retrofits of between 7.5-22.5%[61], and consequently the proposed incentive grants in Armenia can be considered modest. A total of US$ 12.5 million in incentive grants will be used to support vulnerable households in the residential sector. The strategy of working via the existing social support mechanisms aims to ensure that ownership of this support shifts to internal Armenian social security funding.

In the public sector, a small incentive (totalling around US$ 1.5 million) is also justified based on the additionality that a higher level of energy efficiency will be promoted than under the 'business as usual' scenario. In addition, the modest incentive will also serve to accelerate the renovation of buildings, thus improving the quality of life of citizens using public facilities such as hospitals and kindergartens.

community.org/portal/page/portal/ENC_HOME/DOCS/3282025/Final_Report_Scaling_Up_Energy_Efficiency_in_Buildings_in_the_Western_Balkans.pdf

[57] https://ec.europa.eu/energy/sites/ener/files/documents/2014_report_2020-2030_eu_policy_framework.pdf

[58] See page 87 of this report:

https://ec.europa.eu/energy/sites/ener/files/documents/2014_report_2020-2030_eu_policy_framework.pdf

[59] This value is within the lower end of the range of estimations used by the U.S. Environmental Protection Agency for the Social Cost of CO_2 for 2015 which were (in 2011 Dollars) USD 12 per tonne using a 5% average discount rate, USD 39 per tonne using a 3% average discount rate and USD 61 per tonne using a 2.5% average discount rate: http://www.epa.gov/climatechange/EPAactivities/economics/scc.html

[60] See for instance http://aceee.org/files/proceedings/2012/data/papers/0193-000422.pdf,

http://www.epa.gov/cleanenergy/documents/suca/program_incentives.pdf and

http://www.inspirefp7.eu/wp-content/uploads/2014/08/WP2_D2.1b_20140523_P18_Policies-and-incentives-relevant-to-retrofit.pdf

[61] See slide 10 of https://www.energy-community.org/portal/page/portal/ENC_HOME/DOCS/3736187/KfW_3_pillar_approach_EE_public_buildings.pdf

5. PROJECT RESULTS FRAMEWORK

In keeping with UNP guidance, activities have not been included in the above results framework. However, a full list of activities and inputs can be found in Annex 19 which have been taken from the original GCF proposal.

This project will contribute to the following Sustainable Development Goal (s): 7. Ensure access to affordable, reliable, sustainable and modern energy for all					
This project will contribute to the following country outcome included in the UNDAF/Country Programme Document: UNDAF Outcome 7/Country Programme Outcome(s) 4 (13): By 2020, sustainable development principles and good practices for environmental sustainability resilience building, climate change adaptation and mitigation and green economy are introduced and applied. Expected CPAP Output: 4.4 Low carbon and green economy become priority for the Government, supported by relevant regulatory framework and activities.					
This project will be linked to the following output of the UNDP Strategic Plan: Output 1.5: Inclusive and sustainable solutions adopted to achieve increased energy efficiency and universal modern energy access (especially off-grid sources of renewable energy)					
GCF Paradigm shift objectives: Shift to low-emission sustainable development pathways. 1. The project objective is to use an integrated suite of interventions to systematically de-carbonise the existing building stock to realise both energy savings and sustainable development benefits. 2. The project will create a favourable market environment and scalable business model for investment in energy efficiency retrofits, leading to sizeable energy savings and accompanying GHG emission reductions (directly, 1.4 million tCO2 over the 20-year lifetime of the investments; including additional indirect savings, a total of between 4.2-4.4 tCO2eq). It will also catalyse additional private and public sector financing of approximately US$ 100 million.					
	Objective and Outcome Indicators	**Baseline**	**Mid-term Target**	**End of Project Target**	**Assumptions**
SDG indicators	7.3.1 Energy intensity measured in terms of primary energy and GDP	5.75 (Megajoules per USD constant 2011 PPP GDP (Units)) 2012 (http://unstats.un.org/sdgs/indicators/database/ for Armenia)	TBD	TBD	Project data will be collated and shared with the National Statistical Service and other bodies monitoring SDG indicators
UNDP Strategic Plan Indicators UNDP IRRF 1.5: Inclusive and sustainable solutions adopted to achieve increased energy efficiency and universal modern energy access	1.5.1 Number of new development partnerships with funding for improved energy efficiency and/or sustainable energy solutions targeting underserved communities / groups and women # direct project beneficiaries	0 0	20 -	75 210,000	*See* Annex 8

Fund-level impacts						
				Target		
				Mid-term (if applicable)	Final	
M3.0 Reduced emissions from buildings, cities, industries and appliances	GCF core indicator: Tonnes of carbon dioxide equivalent (tCO_2eq) reduced or avoided as a result of Fund-funded projects / programmes	EMIS system to be set up in Component 1 of the Project	0	100,000 tCO_2-eq/year	Direct: 1.39 Mt over 20-year lifetimes of the buildings Indirect: additional 4.2 to 4.4 Mt of savings over the 20-year lifetimes of buildings	Improved thermal condition of buildings results in energy savings and GHG emission savings.
	GCF core indicator: Cost per tCO_2eq, defined as total investment cost / expected lifetime emission reductions	Project monitoring data on costs plus data from the indicator on tonnes of CO_2eq reduced	0	-	US$ 14 / tCO_2e for GCF for direct emission savings, and between US$ 3.4-3.6 / tCO_2e for GCF for the market transformation.	
	GCF core indicator: Volume of finance leveraged by the project and as a result of the Fund's financing, disaggregated by public and private sources	Project reporting	0	-	US$ 100 million, of which US$ 20m is from public sources and US$ 80m is from private sources	

Expected Result	Indicator	Means of Verification (MoV)	Baseline	Target		Assumptions
				Mid-term (if applicable)	Final	
Project outcomes	**Outcomes that contribute to Fund-level impacts**					
M5.0 Strengthened institutional and regulatory systems	5.1 Institutional and regulatory systems that improve incentives for low-emission planning and development and their effective implementation	Score on World Bank RISE indicators for building sector (see Annex 8)	34	64	91	Strengthened institutional and regulatory systems lead to practical change and do not remain on paper
M7.0 Lower energy intensity of buildings, cities, industries and appliances	7.1 Energy intensity / improved efficiency of buildings, cities, industries and appliances as a result of Fund support	Reported data from project monitoring component	Residential buildings: 185 kWh / m^2 Public buildings: 200 kWh / m^2	Reduced by 50%	Reduced by 50%	
1. Robust MRV for the building sector established *(Output 1 – Establishment of building sector MRV and knowledge management)*	Establishment of a web-based, publicly-accessible MRV database	Project reporting	No MRV in place	Website established and fully web-accessible	5,000 website hits per year	MRV systems continue producing data after project end
2. National, sub-national and local authorities adopt and implement an enabling policy framework for energy efficiency retrofits *(Output 2 – Policy de-risking)*	see M5.0 above					
3. Access to affordable capital for energy efficiency retrofits provided *(Output 3 – Financial de-risking)*	Value of loans for building renovation provided	Reported data from project monitoring component	0	US$ 20m	US$ 100m	The Government continues to bring energy prices in line with market prices Level of skills among local professionals is

Expected Result	Indicator	Means of Verification (MoV)	Baseline	Target		Assumptions
				Mid-term (if applicable)	Final	
						maintained at a level that can support market growth Lenders make use of learning opportunities offered by the financial mechanisms supported in this project
4. Affordability of energy efficiency retrofits for most vulnerable households ensured through targeted financial incentives to building / apartment owners / ESCOs *(Output 4 – Financial incentives)*	Number of vulnerable beneficiaries (lowest quintile of household income) with improved building energy efficiency	Applications submitted for the financial incentives scheme	0	10,000	50,000	Targeted financial incentives are aligned with the capital provided for energy efficiency retrofits, effectively leading to the implementation of retrofits
Project outputs / GCF Activities						
1.1 MRV systems for the buildings sector in Armenia established	Development and coverage of MRV system and database	Regular project reporting	NA	Developed and in use for renovated buildings: full coverage of buildings retrofitted in this project	Developed and in use for renovated buildings: full coverage of buildings retrofitted in this project	Building occupants agree to cooperate with the implementation of MRV systems
1.2 Knowledge management and MRV information disseminated	Existence and implementation of a plan for sharing lessons learned Number of men and women users of project website	Regular project reporting	NA	Created and implemented	Number of beneficiaries: 250,000	Learning opportunities offered by this project lead to sustained lending for energy efficiency investments

Expected Result	Indicator	Means of Verification (MoV)	Baseline	Target		Assumptions
				Mid-term (if applicable)	Final	
	Number of women's group involved					
2.1 Public instruments for the promotion of investment in energy efficiency selected	UNDP's framework to support policy-makers in selecting public instruments to promote energy efficiency investment in developing countries used, adapted as necessary	Report on implementation of the framework	Framework not used for energy efficiency in Armenia	Number of public instruments selected: 3	Number of public instruments selected: 3	Policy-makers follow through on implementation of the selected instruments
2.2 Support provided to on-going legal reform in the field of energy efficiency	Binding legislation on building codes and adequate secondary legislation adopted	National legislation	Level 3. Policies proposed and consultation ongoing[62]	Level 4. Strong policy adopted	Level 5. Strong policy adopted and institutional capacity strengthened	UNDP's working relationship with the Government is effectively employed to maintain the momentum for legal reform
2.3 Support provided for the creation of an enabling policy framework for energy efficiency retrofits in multi-owner residential buildings	Adequate secondary legislation – providing a clear and effective set of functional models and a standard set of rules for multi-owner building management bodies to undertake energy efficiency retrofits – developed, introduced and enforced	National legislation	Secondary legislation lacking	Level 6. Sub-sector plans reflect key policy targets	Level 7. Regulatory framework developed	UNDP's working relationship with the Government is effectively employed to maintain the momentum for creation of an enabling policy framework
2.4 Support provided to building owners / managers / owner associations / ESCOs on legal matters related to	Business models for repayment of energy efficiency investments implemented	Regular project reporting	Level 1. No business models for repayment	Level 3. Strong proposal defined with buy-in from	Level 5. Financial mechanism in operation with evidence of stability	Gradual introduction of performance-based contracts and risk transfer to ESCOs, combined with capacity building, lead to

[62] See note below the table for an explanation of the baseline and targets.

Expected Result	Indicator	Means of Verification (MoV)	Baseline	Target		Assumptions
				Mid-term (if applicable)	Final	
energy efficiency retrofit projects			of energy efficiency investments in buildings in place	stakeholders confirmed		the development of an ESCO market
2.5 Exit strategy measures implemented	Additional exit strategy measures designed and implemented	Regular project reporting	N/A	Additional exit strategy measures designed	Additional exit strategy measures implemented	Exit strategy succeeds in maintaining the momentum created by the project and leads to local stakeholders continuing to further develop the market
3.1 Technical assistance provided to banks and other financial institutions	Capacity of banks to develop and market products for energy efficiency retrofits in individual houses Number of men and women professionals trained on appraising investments and developing energy efficiency projects	Survey of bank employees	Banks do not have the capacity to develop and market products for energy efficiency retrofits in individual houses	2 Armenian banks have the capacity to develop and market products for energy efficiency retrofits in individual houses	4 Armenian banks have the capacity to develop and market products for energy efficiency retrofits in individual houses	Banks are interested and participate in capacity building to enable them to deliver energy efficiency projects in individual houses and buildings
3.2 Technical assistance for HOA market facilitation provided to banks	Capacity of banks to develop and market products for energy efficiency retrofits in multi-owner residential buildings	Survey of bank employees	Banks do not have the capacity to develop and market products for energy efficiency retrofits in	2 Armenian banks have the capacity to develop and market products for energy efficiency retrofits in multi-owner	4 Armenian banks have the capacity to develop and market products for energy efficiency retrofits in multi-owner residential buildings	Banks are interested and participate in capacity building to enable them to deliver energy efficiency projects in multi-owner residential buildings

Expected Result	Indicator	Means of Verification (MoV)	Baseline	Target		Assumptions
				Mid-term (if applicable)	Final	
			multi-owner residential buildings	residential buildings		
3.3 Technical assistance provided to local government to develop energy efficiency retrofit projects for publicly-owned buildings	Capacity of local government to develop energy efficiency retrofit projects for publicly-owned buildings	Survey of local government employees	Local government does not have the capacity to develop energy efficiency retrofit projects for publicly-owned buildings	50% of local planning department employees believe local government has the capacity to develop energy efficiency retrofit projects for publicly- owned buildings	80% of local planning department employees believe local government has the capacity to develop energy efficiency retrofit projects for publicly- owned buildings	Local government is interested and participates in capacity building to enable it to deliver energy efficiency projects in public buildings
3.4 Access to affordable capital for energy efficiency retrofits provided	Amount and number of loans for building renovation provided	Reported data from project monitoring component	No lending provided	$20 million	$86.25 million	Economic situation continues to improve
3.5 Marketing platform created	Marketing materials developed and platform created	Marketing materials, project reporting	No marketing materials exist	Marketing materials created and disseminated to at least 5,000 stakeholders	Marketing materials created and disseminated to at least 25,000 stakeholders	Marketing campaign successfully raises awareness of the opportunities offered by building energy efficiency retrofits
4.1 Targeted financial incentives provided to vulnerable groups to help address the affordability gap	Financial mechanism to provide targeted financial incentives in place and incentives provided	Reported data from project monitoring component	No incentives in place	Incentives provided to 15,000 beneficiaries	Incentives provided to 50,000 beneficiaries	Sufficient uptake of the financial incentive among the target market of vulnerable home-owners

Expected Result	Indicator	Means of Verification (MoV)	Baseline	Target		Assumptions
				Mid-term (if applicable)	Final	
	Number of female-headed households who received funding Number of beneficiaries (disaggregated by sex and age) in the female-headed households					

Project activities and inputs can be found in Annex 19 of this project document.

Note on the indicators for 2.2, 2.3:

The indicator rating will be given in a band of 1-10 where (based on the GEF results framework, July 2014):

1. No policy or strategy for climate change is in place or major development policies/strategies have marginal emphasis on climate change
2. Requisite assessments/knowledge products conducted to support sound climate change mitigation enabling policy framework
3. Policy / strategy proposed and consultations ongoing (quality is good and addresses the main climate change mitigation issues related to the relevant sectors)
4. Strong policy / strategy adopted while implementation (or capacity) is weak / in progress
5. Strong policy / strategy adopted and institutional capacity for implementing key policy directives strengthened with adequate budget allocation
6. Sub-sector and institutional plans reflect key policy targets and priority actions of main development / climate plans and capacity for implementation at sub-sector is strengthened
7. Regulatory framework developed to implement the policy / strategy (relevant regulations adopted, routine screenings conducted)
8. Strong policy and regulatory frameworks designed with financial / market / incentive based mechanisms in multiple sectors of the economy
9. Strong institutional capacity to foster innovative mechanisms, and remove constraints for low GHG development in more than one sector – GHG targets are met in more than one sector
10. Enabling policy / regulatory and planning frameworks successfully promote economy-wide GHG mitigation and low GHG development (targets enforced, market mechanism functioning well)

Note on the indicator for 2.4:

The indicator rating will be given in a band of 1-10 where (based on the GEF results framework, July 2014):

1. No such facilities are in place
2. Assessments and technical studies for financial/performance-based mechanisms have been completed
3. Strong proposal defined with buy-in from stakeholders confirmed
4. Resources and capacity for financial/incentive mechanisms secured
5. Financial / performance based mechanism in operation with evidence of stability
6. Financial / performance based mechanism successfully demonstrated
7. Policy and enabling framework addresses any constraints to wider uptake of such mechanisms
8. Incidence of replication and scale-up within and across sectors
9. Substantive replication and scale-up of financial / performance-based mechanisms (significant percent of sector investment flows through such mechanisms or significant volume of such investments)
10. Substantial GHG emission reduction/mitigation in associated sectors realised through the mechanism

6. MANAGEMENT ARRANGEMENTS

i. Roles and responsibilities of the project's governance mechanism

The project will be implemented following UNDP's National Implementation Modality (NIM), according to the Standard Basic Assistance Agreement between UNDP and the Government of Armenia, and the Country Programme Action Plan (CPAP). The NIM is explicitly designed to ensure domestic actors and systems are used to strengthen national ownership, accountability and capacity development.

The **Implementing Partner** (GCF Executing Entity) for this project is the Ministry of Nature Protection (MoNP), the national authorised body for UNFCCC implementation in Armenia and the appointed NDA for the GCF. MoNP has been coordinating climate change programmes since 1997. The Implementing Partner is the entity responsible and accountable for managing the project, including the monitoring and evaluation of project interventions, achieving project outcomes, and for the effective use of the project resources. The Implementing Partner is responsible for:

- Approving and signing the multiyear workplan;
- Approving and signing the combined delivery report at the end of the year; and,
- Signing the financial report or the funding authorization and certificate of expenditures.

The project organisation structure is summarised in Figure 2.

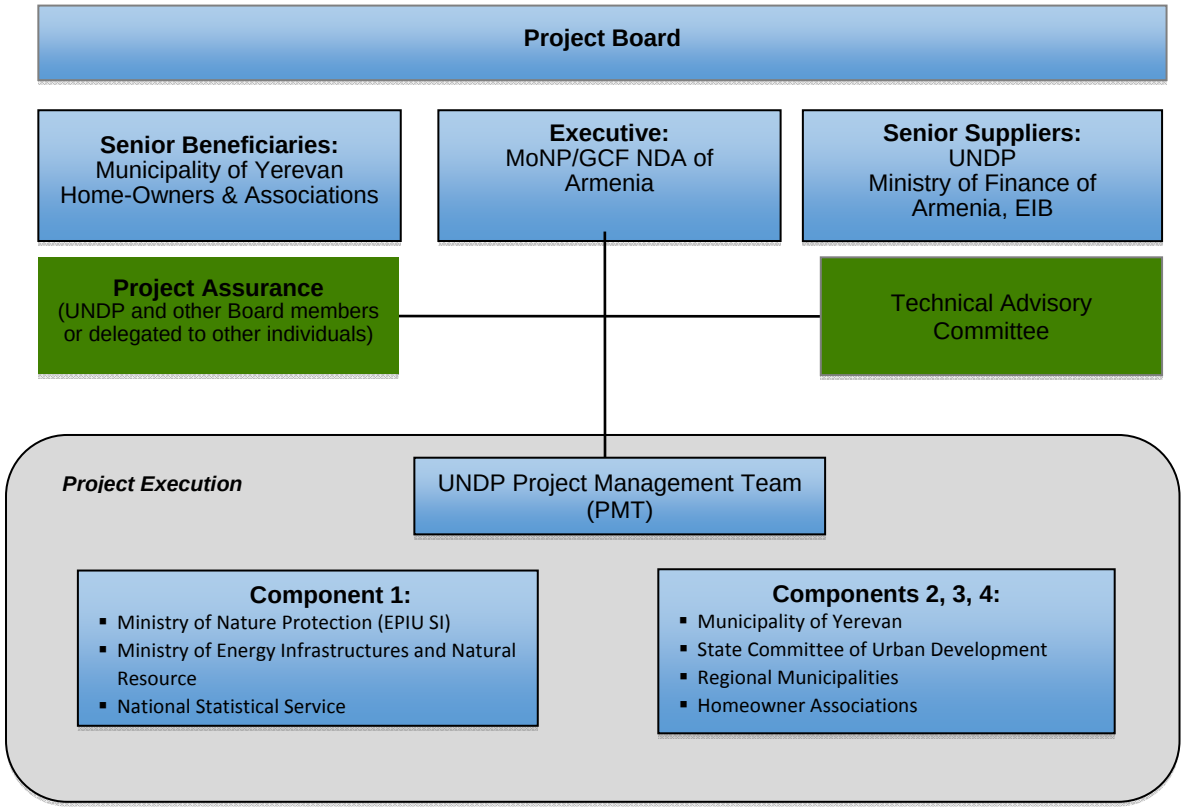

Figure 2. Project Organisation Structure

The following parties will assist MoNP in successfully delivering project outcomes: MoNP's Environmental Project Implementation Unit State Institution (EPIU SI) and the Municipality of Yerevan (through Project Management Team (PMT) – to be established), as the Responsible Parties acting on behalf of MoNP (Executing Entity of this project). HACT assessment of EPIU SI and Municipality of Yerevan has been conducted at the request of GCF before the project signature.

Day to day implementation of the project will be conducted by PMT operating under UNDP rules and procedures. The responsible parties will act on behalf of the implementing partner on the basis of written agreement to purchase or provide services using the project budget. The responsible parties will also manage the use of these goods and services to carry out project activities and produce outcomes.

Project Board: The Project Board (also called Project Steering Committee) is the group responsible for making by consensus, management decisions for a project when guidance is required by the Project Manager, including recommendation for UNDP/Implementing Partner approval of project plans and revisions. The Project Board will be comprised of the representatives of the Ministry of Nature Protection, the Ministry of Finance, Yerevan Municipality, UNDP and financing institutions (EIB). Each institution will formally appoint a representative to the Board. The project's governance mechanism (i.e., project board) will hold regular project reviews to assess the performance of the project and review the Multi-Year Work Plan to ensure realistic budgeting over the life of the project. In order to ensure UNDP's ultimate accountability, Project Board decisions will be made in accordance with standards that shall ensure management for development results, best value for money, fairness, integrity, transparency and effective international competition. In case a consensus cannot be reached within the Board, the final decision shall rest with the UNDP Portfolio Manager.

Specific responsibilities of the Project Board include:

- Provide overall guidance and direction to the project, ensuring it remains within any specified constraints;
- Address project issues as raised by the project manager;
- Provide guidance on new project risks, and agree on possible countermeasures and management actions to address specific risks;
- Agree on project manager's tolerances as required;
- Review the project progress, and provide direction and recommendations to ensure that the agreed deliverables are produced satisfactorily according to plans;
- Appraise the annual project implementation report, including the quality assessment rating report; make recommendations for the workplan;
- Provide ad hoc direction and advice for exceptional situations when the project manager's tolerances are exceeded;
- Assess and decide to proceed on project changes through appropriate revisions.

The composition of the Project Board must include the following roles:

1) **Executive:** The Executive is an individual who represents ownership of the project who will chair the Project Board. This role can be held by a representative from the Government Cooperating Agency or UNDP. The Executive is the Ministry of Nature Protection.

   The Executive is ultimately responsible for the project, supported by the Senior Beneficiary and Senior Supplier. The Executive's role is to ensure that the project is focused throughout its life cycle on achieving its objectives and delivering outputs that will contribute to higher level outcomes. The Executive has to ensure that the project gives value for money, ensuring cost-conscious approach to the project, balancing the demands of beneficiary and suppler.

   Specific Responsibilities: (as part of the above responsibilities for the Project Board)
   - Ensure that there is a coherent project organisation structure and logical set of plans;
   - Set tolerances in the AWP and other plans as required for the Project Manager;
   - Monitor and control the progress of the project at a strategic level;
   - Ensure that risks are being tracked and mitigated as effectively as possible;
   - Brief relevant stakeholders about project progress;
   - Organise and chair Project Board meetings.

2) **Senior Supplier:** The Senior Supplier is an individual or group representing the interests of the parties concerned which provide funding and/or technical expertise to the project (designing, developing, facilitating, procuring, implementing). The Senior Supplier's primary function within the Board is to provide guidance regarding the technical feasibility of the project. The Senior Supplier role must have the authority to commit or acquire supplier resources required. If necessary, more than one person may be required for this role. The Senior Suppler is: UNDP, Ministry of Finance of Armenia, and EIB.

   Specific Responsibilities: (as part of the above responsibilities for the Project Board)
   - Make sure that progress towards the outputs remains consistent from the supplier perspective;

- Promote and maintain focus on the expected project output(s) from the point of view of supplier management;
- Ensure that the supplier resources required for the project are made available;
- Contribute supplier opinions on Project Board decisions on whether to implement recommendations on proposed changes;
- Arbitrate on, and ensure resolution of, any supplier priority or resource conflicts.

3) **Senior Beneficiary:** The Senior Beneficiary is an individual or group of individuals representing the interests of those who will ultimately benefit from the project. The Senior Beneficiary's primary function within the Board is to ensure the realization of project results from the perspective of project beneficiaries. The Senior Beneficiary role is held by a representative of the government or civil society. The Senior Beneficiary is the Municipality of Yerevan.

   The Senior Beneficiary is responsible for validating the needs and for monitoring that the solution will meet those needs within the constraints of the project. The Senior Beneficiary role monitors progress against targets and quality criteria. This role may require more than one person to cover all the beneficiary interests. For the sake of effectiveness, the role should not be split between too many people.

   Specific Responsibilities (as part of the above responsibilities for the Project Board)
   - Prioritize and contribute beneficiaries' opinions on Project Board decisions on whether to implement recommendations on proposed changes;
   - Specification of the Beneficiary's needs is accurate, complete and unambiguous;
   - Implementation of activities at all stages is monitored to ensure that they will meet the beneficiary's needs and are progressing towards that target;
   - Impact of potential changes is evaluated from the beneficiary point of view;
   - Risks to the beneficiaries are frequently monitored.

The Board will be guided by the principles of constructive and mutually beneficial partnership, bringing together national counterparts, beneficiaries, development partners and UNDP on an equal basis to decide on project management issues, and in line with the UNDP Programme and Operations Policy and Procedure (POPP) and other documents. Board meetings will be scheduled twice a year, unless an ad hoc meeting is requested in writing by a member of the Board.

Technical Advisory Committee: The Technical Advisory Committee will comprise representatives of interested public and private agencies. The Ministry of Energy Infrastructure and Natural Resources, the State Urban Development Committee, the Territorial Administration and Development Ministry, the Ministry of Economic Development and Investment, the Ministry of Nature Protection, the Ministry of Social Affairs and Labor, the R2E2 Fund, the National Institute for Standards of the Republic of Armenia, and the National University of Architecture and Construction will be invited to nominate representatives to the Technical Advisory Committee. This group will meet annually, with periodic consultation as needed throughout the year. The Board will actively seek and take into account the input from the Technical Advisory Committee. Once a year, Board meetings will be timed to occur immediately after the annual meetings of the Technical Advisory Committee.

Project Manager: The Project Manager has the authority to run the project on a day-to-day basis on behalf of UNDP within the constraints laid down by the Project Board. The Project Manager function will end when the final project Final Independent Evaluation Report, and other documentation required by the GCF and UNDP, have been completed and submitted to UNDP. The Project Manager is responsible for day-to-day management and decision-making for the project and for the establishment of internal control processes in the project. The Project Manager's prime responsibility is to ensure that the project produces the results specified in the project document, to the required standard of quality and within the specified constraints of time and cost. The Project Manager will be supported by technical and legal advisors. The Terms of Reference of the key technical staff will be developed during the inception phase.

The Implementing Partner appoints the Project Manager, who should be different from the Implementing Partner's representative in the Project Board.

Specific responsibilities of the Project Manager include:

- Provide direction and guidance to project team(s)/ responsible party(ies);
- Liaise with the Project Board to assure the overall direction and integrity of the project;

- Identify and obtain any support and advice required for the management, planning and control of the project;
- Responsible for project administration;
- Plan the activities of the project and monitor progress against the project results framework and the approved annual workplan;
- Mobilize personnel, goods and services, training and micro-capital grants to initiative activities, including drafting terms of reference and work specifications, and overseeing all contractors' work;
- Monitor events as determined in the project monitoring schedule plan/timetable, and update the plan as required;
- Manage requests for the provision of financial resources by UNDP, through advance of funds, direct payments or reimbursement using the fund authorization and certificate of expenditures;
- Monitor financial resources and accounting to ensure the accuracy and reliability of financial reports;
- Be responsible for preparing and submitting financial reports to UNDP on a quarterly basis;
- Manage and monitor the project risks initially identified and submit new risks to the project board for consideration and decision on possible actions if required; update the status of these risks by maintaining the project risks log;
- Capture lessons learned during project implementation;
- Prepare the annual workplan for the following year; and update the Atlas Project Management module if external access is made available;
- Prepare the Annual Project Report and submit the final report to the Project Board;
- Based on the Annual Project Report and the Project Board review, prepare the AWP for the following year;
- Ensure the Interim Independent Evaluation (IIE) process is undertaken as per the UNDP guidance, and submit the final IIE report to the Project Board;
- Identify follow-on actions and submit them for consideration to the Project Board;
- Ensure the Final Independent Evaluation (FIE) process is undertaken s per the UNDP guidance, and submit the FIE report to the Project Board.

Project Assurance:

UNDP provides a three – tier supervision, oversight and quality assurance role – funded by the agency fee – involving UNDP staff in Country Offices and at regional and headquarters levels. Project Assurance must be totally independent of the Project Management function. The quality assurance role supports the Project Board and Project Management Unit by carrying out objective and independent project oversight and monitoring functions. This role ensures appropriate project management milestones are managed and completed. The Project Board cannot delegate any of its quality assurance responsibilities to the Project Manager. This project oversight and quality assurance role is covered by the accredited entity fee provided by the GCF.

As an Accredited Entity to the GCF, UNDP delivers the following GCF-specific oversight and quality assurance services: (i) day to day project oversight supervision covering the start-up and implementation; (ii) oversight of project completion; and (iii) oversight of project reporting. A detailed list of the services is presented in the table below.

Function	Detailed description of activity	Typical GCF fee breakdown
Day-to-day oversight supervision	**1. Project start-up:** • In the case of Full Funding Proposals, prepare all the necessary documentation for the negotiation and execution of the Funding Activity Agreement (for the project) with the GCF, including all schedules • In the case of readiness proposals, if needed assist the NDA and/or government partners prepare all the necessary documentation for approval of a readiness grant proposal • Prepare the Project Document with the government counterparts • Technical and financial clearance for the Project Document	70%

Function	Detailed description of activity	Typical GCF fee breakdown
	• Organize Local Project Appraisal Committee • Project document signature • Ensure quick project start and first disbursement • Hire project management unit staff • Coordinate/prepare the project inception workshop • Oversee finalization of the project inception workshop report **2. Project implementation:** • Project Board: Coordinate/prepare/attend annual Project Board Meetings • Annual work plans: Quality assurance of annual work plans prepared by the project team; issue UNDP annual work plan; strict monitoring of the implementation of the work plan and the project timetable according to the conditions of the FAA and disbursement schedule (or in the case of readiness the approved readiness proposal) • Prepare GCF/UNDP annual project report: review input provided by Project Manager/team; provide specialized technical support and complete required sections • Portfolio Report (readiness): Prepare and review a Portfolio Report of all readiness activities done by UNDP in line with Clause 9.02 of the Readiness Framework Agreement. • Procurement plan: Monitor the implementation of the project procurement plan • Supervision missions: Participate in and support in-country GCF visits/learning mission/site visits; conduct annual supervision/oversight site missions • Interim Independent Evaluation Report: Initiate, coordinate, finalize the project interim evaluation report and management response • Risk management and troubleshooting: Ensure that risks are properly managed, and that the risk log in Atlas (UNDP financial management system) is regularly updated; Troubleshooting project missions from the regional technical advisors or management and programme support unit staff as and when necessary (i.e. high risk, slow performing projects) • Project budget: Provide quality assurance of project budget and financial transactions according to UNDP and GCF policies • Performance management of staff: where UNDP supervises or co-supervises project staff • Corporate level policy functions: Overall fiduciary and financial policies, accountability and oversight; Treasury Functions including banking information and arrangements and cash management; Travel services, asset management, and procurement policies and support; Management and oversight of the audit exercise for all GCF projects; Information Systems and Technology provision, maintenance and support; Legal advice and contracting/procurement support policy advice; Strategic Human Resources Management and related entitlement administration; Office of Audit and Investigations oversight/investigations into allegations of misconduct, corruption, wrongdoing and fraud; and social and environmental compliance unit and grievance mechanism.	

Function	Detailed description of activity	Typical GCF fee breakdown
Oversight of project completion	• Initiate, coordinate, finalize the Project Completion Report, Final Independent Evaluation Report and management response • Quality assurance of final evaluation report and management response • Independent Evaluation Office assessment of final evaluation reports; evaluation guidance and standard setting • Quality assurance of final cumulative budget implementation and reporting to the GCF • Return of any un-spent GCF resources to the GCF	10%
Oversight of project reporting	• Quality assurance of the project interim evaluation report and management response • Technical review of project reports: quality assurance and technical inputs in relevant project reports • Quality assurance of the GCF annual project report • Preparation and certification of UNDP annual financial statements and donor reports • Prepare and submit fund specific financial reports	20%
	TOTAL	**100%**

MoNP: MoNP will be responsible for the overall supervision of the project to ensure synergy with other GHG mitigation policies and measures in the country. UNDP has a long track-record of successful collaboration with MoNP, dating from 1997. MoNP has the capacity and knowledge to guide and oversee the conceptual aspect of project implementation, including professional guidance on achieving the climate change mitigation objectives and overseeing the GHG emissions reduction impacts. MoNP has been the implementing agency for the full-size UNDP- supported and GEF-financed 'Improving Energy Efficiency of Municipal Heat and Hot Water Supply' project and for the UNDP- supported and GEF-financed 'Improving Energy Efficiency in Buildings' project, and has a proven track-record in successful implementation and cooperation with different ministries and stakeholders. The day-to-day implementation of the project will be carried out through the well-established UNDP Climate Change Programme Unit coordinated by MoNP. GCF funds will not be used to pay the salaries of Government personnel, whose costs will be fully covered by the Government.

The MoNP will appoint the **Project National Director** with following role and responsibilities:

- Bears the responsibility for coordination of project realization, in the side of the Government of RA;
- Directs the project over its entire duration, in order to provide for the realization of project action steps in accordance with the project document;
- Provides for coordination among project action steps and corresponding steps made in the framework of government programs and relevant incentives;
- Presents various forms of support for the successful execution of the project and corresponding steps after completion of the project, including the long-term persistence of project results, as well as dissemination of lessons learned;
- Confirms Annual Work Plans and project budgets;
- Confirms financial and substantive reports on project realization;
- Provides for collaboration with partners and coordination with departments of the National Implementing Partner and Responsible Parties.

Environmental Project Implementation Unit State Institution (EPIU SI): MoNP's EPIU SI will be closely involved in project implementation (in particular, it will lead the Component 1 on MRV) and will also receive assistance and capacity building from the project to prepare for its subsequent accreditation under the GCF as a National Accredited Entity. EPIU SI is currently undergoing the third

stage of accreditation process for the Adaptation Fund, and the support to GCF accreditation will build on this AF baseline.

Municipality of the City of Yerevan: The Municipality of the City of Yerevan, as the major beneficiary of the project, will also act as a Responsible Party of the project. The Municipality is approving and managing the city budget on an annual base. The 2015 budget, approved on December 23 by Council decision #265-N, involves income of approximately US$ 149.73 million and expenditures of approximately US$ 150.25 million. Yerevan Municipality has a special procurement department responsible for all procurements, including services and works executed through open and competitive tenders in compliance with the Law on Procurement of the Republic of Armenia. Yerevan Municipality has a long track-record of successful collaboration in, and implementation of, international projects. Some of the most recent examples include the implementation of the 'Sustainable Transport Development Investment Programme' under a loan agreement between the Armenian Republic and the Asian Development Bank. The project, with a total value of US$ 48 million, is implemented by the Municipality through the 'Yerevan Construction Investment Project Implementation Unit (PIU)'. The Municipality is also an implementing agency of the EBRD US$ 4.0 million loan and EURO 1.9 million grant project aimed at energy efficient upgrades of the street lighting system in the city.

Terms of reference (including selection, membership, and accountability) will be established for each function in the structure. Signed conflict of interest declarations will be required from members of the Project Board, Executive, Project Management Team and Project Implementation Unit.

The energy efficiency retrofits themselves will be performed by private-sector engineering companies. For public buildings, procurement will take place according to the UNDP and national public procurement rules. For residential beneficiaries, procurement requirement may be specified by the banks that are providing loans, subject to the on-lending requirements. The approach will be competitive / private sector-oriented, with the aim of creating a competitive sustainable market for energy efficiency retrofits in the country.

The approach to funding the four project components are as follows:

- Component 1: Competitive and open tendering for individual and company services
- Component 2: Competitive and open tendering for individual and company services
- Component 3: Competitive and open tendering for individual and company services
- Component 4: For investments that meet eligibility requirements (i.e. grants to vulnerable households), incentives funds will be provided by UNDP via municipalities or the PMT. Vulnerable households, recipients of the funds, will be selected as part of the social safety net programme, the Family Benefit Scheme, which already provide compensation to eligible households against energy price increases. The scheme uses a scoring system for household vulnerability and allocates state family benefits via Social Service Centres in each region/district. One option for provision of targeted incentives is the use of a voucher scheme given via the Social Service Centre that are passed by the beneficiary to the installer / ESCO (to be competitively selected under Component 3) and then redeemed for eligible measures following ex-post verification). Under the proposed scheme the payment will be made directly to the companies (ESCOs) against vouchers and subject to positive verification that energy efficiency measures were implemented and savings achieved.

The UNDP CO will oversee annual financial audits, and the execution of an Interim Independent Evaluation and a Final Independent Evaluation. All financial transactions and agreements, including contracts with staff and consultants as well as procurement of goods and services, will follow the rules and regulations of the United Nations. The UNDP Regional Coordinating Unit will provide regular programmatic and administrative oversight as well. See Figure 2 for a graphical representation of the project management structure.

To ensure smooth start-up of the project, implementation will commence with an inception phase. In this phase, initial consultations between all parties will be conducted to consolidate the methodology and detailed work plan. At this point, project activities will be reviewed and if necessary, adjustments will be made to take into account any new developments such as changes in market conditions and policy environment.

ii. Direct Project Services as requested by Government: (services provided to government directly under NIM)

The UNDP Country Office will also deliver a pre-determined set of project-specific execution services at the request of the Government. To ensure the strict independence required by the GCF and in accordance with the UNDP Internal Control Framework, these execution services should be delivered independent from the GCF-specific oversight and quality assurance services (i.e. not done by same person to avoid conflict of interest).

These execution services will be charged to the project budget in accordance with the UNDP's Harmonized Conceptual Funding Framework and Cost Recovery Methodology. The letter of agreement for these direct project costs is included in Annex 2 to this project document.

The government has requested UNDP to undertake the following services (noted in the Addendum to Annex 2): payment process, credit card payment, new vendor creation in ATLAS, payroll validation, leave monitoring, IC and SC recruitment, issue IDs, travel expenses (F10) settlement, ticket request, hotel reservation, visa request, vehicle registration, procurement process involving local CAP or RACP/ACP, procurement not involving review bodies, and disposal of equipment.

iii. Project Management Team

Day to day implementation of the project will be conducted by the PMT operating under UNDP rules and procedures. The PMT will be led by the Project Manager, whose role is described in the section above.

To ensure sustainability and linkage with ongoing climate change projects under UNDP implementation, the project team will work closely with Climate Change Programme Unit coordinated by and located in the MoNP, thus ensuring synergy and cost efficiency of activities under implementation. The office space will be provided by the MoNP as part of government in-kind contribution, as well as premises for meetings, means of communication and other utilities, as well as information and time of civil servants and governmental officials involved in Technical Advisory Committee.

The project will operate in close collaboration with two other ongoing UNDP projects on energy efficiency in Armenia. The UNDP-GEF "Green Urban Lighting" UNDP-GEF/00074869 and UNDP "Regulatory Framework to Promote of Energy Efficiency in the Countries of the Eurasian Economic Union" project, the later which will commence around the time of the inception of the GCF project. Linkage with these projects will provide valuable connections with outreach partners, including apartment-owner associations and the Municipality of Yerevan as well as other municipalities. The UNDP projects will also offer collaborative assistance with regard to building codes and demonstration projects in public buildings as some objectives are in line with those of the UNDP-GCF project (e.g. integration of minimum lighting efficiency standards, procurement rules, labelling of and testing of appliances, materials, etc.). All three projects will be overseen by UNDP Climate Change Programme Coordinator and Head of UNDP Energy and Environment Unit of UNDP in Armenia.

The Project Manager will be supported by international consultants as well as by local support staff in the overall project management. The services of an international consultant will be engaged during the project inception phase.

The PMT will be staffed by a construction engineer, energy audit specialist and public relations specialist.

Project support staff will provide services required for the project implementation: administrative assistant will ensure support in financial management and accountability, issuance of payments, support related to project reporting, filing of project information, ensuring completeness and timeliness of financial reporting and other support on financial matters, procurement or hiring procedures; IT support, management of the office LAN and website services will be provided by dedicated experts; the driver-logistics clerk will provide all required logistics support.

The four project components will be staffed by the task leaders and short time local experts and international experts, working closely together.

The PMT will assist in recruitment of International and National Consultants, including candidate search/selection, preparation of TORs, and supervision of the deliverables; project coordination, including organization of regular meetings with the national partners; financial management and accountability, issuance of payments, technical reporting including preparation of progress reports; monitoring and evaluation; organization of training/workshop activities; and other tasks.

iv. Agreement on intellectual property rights and use of logo on the project's deliverables

In order to accord proper acknowledgement to the GCF for providing grant funding, the GCF logo will appear together with the UNDP logo on all promotional materials, other written materials like publications developed by the project, and project hardware. Any citation on publications regarding projects funded by the GCF will also accord proper acknowledgement to the GCF as per the GCF branding guidelines.

v. Disclosure of information

Information will be disclosed in accordance with relevant policies notably the UNDP Disclosure Policy[63] and the GCF Disclosure Policy[64].

vi. Carbon offsets or units

As outlined in the AMA agreement between UNDP and the GCF, to the extent permitted by applicable laws and regulations, the Implementing Partner will ensure that any greenhouse gas emission reductions (e.g. in emissions by sources or an enhancement of removal by sinks) achieved by this project shall not be converted into any offset credits or units generated thereby, or if so converted, will be retired without allowing any other emissions of greenhouse gases to be offset.

[63] See http://www.undp.org/content/undp/en/home/operations/transparency/information_disclosurepolicy/

[64] See https://www.greenclimate.fund/documents/20182/184476/GCF_B.12_24_-_Comprehensive_Information_Disclosure_Policy_of_the_Fund.pdf/f551e954-baa9-4e0d-bec7-352194b49bcb

7. MONITORING AND EVALUATION PLAN

The project results as outlined in the project results framework will be monitored and reported annually and evaluated periodically during project implementation to ensure the project effectively achieves these results.

Project-level monitoring and evaluation will be undertaken in compliance with the UNDP POPP and the UNDP Evaluation Policy. While these UNDP requirements are not outlined in this project document, the UNDP Country Office will work with the relevant project stakeholders to ensure UNDP M&E requirements are met in a timely fashion and to high quality standards. Additional mandatory GCF-specific M&E requirements will be undertaken in accordance with relevant GCF policies.

In addition to these mandatory UNDP and GCF M&E requirements, other M&E activities deemed necessary to support project-level adaptive management will be agreed during the Project Inception Workshop and will be detailed in the Inception Workshop Report. This will include the exact role of project target groups and other stakeholders in project M&E activities including national/regional institutes assigned to undertake project monitoring.

(i) M&E oversight and monitoring responsibilities

Project Manager: The Project Manager is responsible for day-to-day project management and regular monitoring of project results and risks, including social and environmental risks. The Project Manager will ensure that all project staff maintain a high level of transparency, responsibility and accountability in M&E and reporting project results. The Project Manager will develop annual work plans to ensure the efficient implementation of the project. The Project Manager will inform the Project Board, the UNDP Country Office and the UNDP-GEF Regional Technical Advisor of any delays or difficulties as they arise during implementation so that appropriate support and corrective measures can be adopted.

The Project Manager will develop annual work plans to support the efficient implementation of the project. The Project Manager will ensure that the standard UNDP and GCF M&E requirements are fulfilled to the highest quality. This includes, but is not limited to, ensuring the results framework indicators are monitored annually in time for evidence-based reporting in the Annual Project Report, and that the monitoring of risks and the various plans/strategies developed to support project implementation (e.g. Environmental and social management plan, gender action plan etc..) occur on a regular basis.

Project Board: The Project Board will take corrective action as needed to ensure the project achieves the desired results. The Project Board will hold project reviews to assess the performance of the project and appraise the Annual Work Plan for the following year. In the project's final year, the Project Board will hold an end-of-project review to capture lessons learned and discuss opportunities for scaling up and to highlight project results and lessons learned with relevant audiences. This final review meeting will also discuss the findings outlined in the project Final Independent Evaluation report and the management response.

Project Implementing Partner: The Implementing Partner is responsible for providing any and all required information and data necessary for timely, comprehensive and evidence-based project reporting, including results and financial data, as necessary and appropriate. The Implementing Partner will strive to ensure project-level M&E is undertaken by national institutes, and is aligned with national systems so that the data used by and generated by the project supports national systems.

Country Office: The UNDP Country Office will support the Project Manager as needed, including through annual supervision missions. The annual supervision missions will take place according to the schedule outlined in the annual work plan. Supervision mission reports will be circulated to the project team and Project Board within one month of the mission. The UNDP Country Office will initiate and organize key M&E activities including the Annual Project Report, the Interim Independent Evaluation and the Final Independent Evaluation. The UNDP Country Office will also ensure that the standard UNDP and GCF M&E requirements are fulfilled to the highest quality.

The UNDP Country Office is responsible for complying with all UNDP project-level M&E requirements as outlined in the UNDP POPP. This includes ensuring the UNDP Quality Assurance Assessment during implementation is undertaken annually; the regular updating of the ATLAS risk log; and, the updating of the UNDP gender marker on an annual basis based on gender mainstreaming progress

reported in the Annual Project Report and the UNDP ROAR. Any quality concerns flagged during these M&E activities (e.g. Annual Project Report quality assessment ratings) must be addressed by the UNDP Country Office and the Project Manager.

The UNDP Country Office will support GCF staff (or their designate) during any missions undertaken in the country, and support any ad-hoc checks or ex post evaluations that may be required by the GCF.

The UNDP Country Office will retain all project records for this project for up to seven years after project financial closure in order to support any ex-post reviews and evaluations undertaken by the UNDP Independent Evaluation Office (IEO) and/or the GCF.

UNDP-Global Environmental Finance Unit (UNDP-GEF): Additional M&E and implementation oversight, quality assurance and troubleshooting support will be provided by the UNDP-GEF Regional Technical Advisor and the UNDP-GEF Directorate as outlined in the management arrangement section above.

(ii) Audit

The project will be audited according to UNDP Financial Regulations and Rules and applicable audit policies on NIM implemented projects.[65] Additional audits may be undertaken at the request of the GCF.

(iii) Additional monitoring and reporting requirements

Project inception Workshop and Report

A project inception workshop will be held within two months after the project document has been signed by all relevant parties to, amongst others:

a) re-orient project stakeholders to the project strategy and discuss any changes in the overall context that influence project implementation;

b) discuss the roles and responsibilities of the project team, including reporting and communication lines and conflict resolution mechanisms;

c) review the results framework and discuss reporting, monitoring and evaluation roles and responsibilities and finalise the M&E plan;

d) Discuss reporting, monitoring and evaluation roles and responsibilities and finalize the M&E budget; identify national/regional institutes to be involved in project-level M&E;
e) Identify how project M&E can support national monitoring of SDG indicators as relevant;

f) Update and review responsibilities for monitoring the various project plans and strategies, including g) review financial reporting procedures and mandatory requirements, and agree on the arrangements for the annual audit;

h) plan and schedule Project Board meetings and finalise the first year annual work plan.

The Project Manager will prepare the inception report no later than one month after the inception workshop. The final inception report will be cleared by the UNDP Country Office and the UNDP Regional Technical Advisor, and will be approved by the Project Board.

Annual Project Report

The Project Manager, the UNDP Country Office, and the UNDP-GEF Regional Technical Advisor will provide objective input to the annual project report covering the calendar year for each year of project implementation. The Project Manager will ensure that the indicators included in the project results framework are monitored annually in advance so that progress can be included in the report. Any environmental and social risks and related management plans will be monitored regularly, and progress will be included in the report.

[65] See guidance here: https://info.undp.org/global/popp/frm/pages/financial-management-and-execution-modalities.aspx

The Annual Project Report will be shared with the Project Board. The UNDP Country Office will coordinate the input of other stakeholders to the report as appropriate. The quality rating of the previous year's report will be used to inform the preparation of the subsequent report.

Lessons learned and knowledge generation: Results from the project will be disseminated within and beyond the project intervention area through existing information sharing networks and forums. 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 the project. The project will identify, analyse and share lessons learned that might be beneficial to the design and implementation of similar projects and disseminate these lessons widely. There will be continuous information exchange between this project and other projects of similar focus in the same country, region and globally.

Periodic Monitoring through site visits

The UNDP Country Office and the UNDP-GEF RCU will conduct visits to project sites based on the agreed schedule in the project's Inception Report / Annual Work Plan to assess first hand project progress. Other members of the Project Board may also join these visits. A Field Visit Report / Back To Office Report (BTOR) will be prepared by the Country Office and UNDP RCU and will be circulated no less than one month after the visit to the project team and PSC members.

Interim Independent Evaluation

An Interim Independent Evaluation (IIE) process will begin after the second Annual Project Report has been submitted to the GCF. The IIE will be conducted to conclude at the midpoint of the project (2.5 years after Project Document signature). The IIE report is expected to be submitted to the GCF in the year marking the halfway point between the Project Document signature. The IIE findings and responses outlined in the management response will be incorporated as recommendations for enhanced implementation during the final half of the project's duration. The terms of reference, the review process and the IIE report will follow the standard templates and guidance prepared by the UNDP IEO for GEF-financed projects available on the UNDP Evaluation Resource Center. As noted in this guidance, the evaluation will be 'independent, impartial and rigorous'. The consultants that will be hired to undertake the assignment will be independent from organizations that were involved in designing, executing or advising on the project to be evaluated. Other stakeholders will be involved and consulted during the Final Independent Evaluation process. Additional quality assurance support is available from the UNDP-GEF Directorate. The final IIE report will be cleared by the UNDP Country Office and the UNDP Regional Technical Advisor, and will be approved by the Project Board. The final IIE report will be available in English.

Final Independent Evaluation

An independent Final Independent Evaluation (FIE) will take place upon completion of all major project outputs and activities. The Final Independent Evaluation process will begin at least six months before operational closure of the project allowing the evaluation mission to proceed while the project team is still in place, yet ensuring the project is close enough to completion for the evaluation team to reach conclusions on key aspects such as project sustainability. The Final Independent Evaluation Report is to be submitted to the GCF Secretariat 3 months before the scheduled end of the project.

The Project Manager will remain on contract until the FIE report and management response have been finalized. The terms of reference, the review process and the FIE report will follow the standard templates and guidance prepared by the UNDP IEO for GEF-financed projects available on the UNDP Evaluation Resource Center. As noted in this guidance, the evaluation will be 'independent, impartial and rigorous'. The consultants that will be hired to undertake the assignment will be independent from organizations that were involved in designing, executing or advising on the project to be evaluated. Additional quality assurance support is available from the UNDP-GEF Directorate. The FIE report will be cleared by the UNDP Country Office and the UNDP Regional Technical Advisor, and will be approved by the Project Board. The FIE report will be available in English. The FIE report will be publically available in English on the UNDP ERC.

The UNDP Country Office will include the planned project Final Independent Evaluation in the UNDP Country Office evaluation plan, and will upload the Final Independent Evaluation report in English and the management response to the public UNDP Evaluation Resource Centre (ERC) (www.erc.undp.org).

The UNDP Country Office will retain all M&E records for this project for up to seven years after project financial closure in order to support ex-post evaluations.

Final Report

The Project Completion Report (Final APR) along with the FIE report and corresponding management response will serve as the final project report package. The final project report package shall be discussed with the Project Board during an end-of-project review meeting to discuss lesson learned and opportunities for scaling up.

Communications and visibility requirements

Full compliance is required with UNDP's Branding Guidelines. These can be accessed at http://intra.undp.org/coa/branding.shtml, and specific guidelines on UNDP logo use can be accessed at: http://intra.undp.org/branding/useOfLogo.html. Amongst other things, these guidelines describe when and how the UNDP logo needs to be used, as well as how the logos of donors to UNDP projects needs to be used. For the avoidance of any doubt, when logo use is required, the UNDP logo needs to be used alongside the GCF logo. The UNDP logo can be accessed at http://intra.undp.org/coa/branding.shtml.

Full compliance is also required with the GCF's guidelines concerning communications and visibility.

Where other agencies and project partners have provided support through co-financing, their branding policies and requirements should be similarly applied.

Table 5. M&E workplan and budget

Type of M&E activity	Responsible Parties	Budget US$ *Excluding project team staff time*	Timeframe
Inception Workshop	▪ UNDP CO	Indicative cost: $10,000	3 months from first GCF disbursement to organize inception meeting
Inception Workshop Report and baseline assessment	▪ Project Manager ▪ UNDP CO		At least 5 months required to collect baselines after Inception Meeting is conducted
Standard UNDP monitoring and reporting requirements as outlined in the UNDP POPP	UNDP Country Office	None	Quarterly, annually
Monitoring of indicators in project results framework *(including hiring of external experts, project surveys, data analysis etc…)*	Project Manager	Per year: $10,000, Or 60,000	Annually
Annual Project Report	▪ Project manager and team ▪ UNDP CO ▪ UNDP-GEF Team	None	Annually
NIM Audit as per UNDP audit policies	▪ UNDP Country Office	Indicative cost per year: 5,000 Or $30,000	Annually or other frequency as per UNDP Audit policies
Monitoring of environmental and social risks, and corresponding management plans as relevant	Project Manager ▪ UNDP CO	None	On-going
Monitoring of gender action plan Monitoring of stakeholder engagement plan	Project Manager ▪ UNDP CO	Per year: $2,000 Or $12,000	On-going

Type of M&E activity	Responsible Parties	Budget US$ *Excluding project team staff time*	Timeframe
Addressing environmental and social grievances	Project Manager UNDP Country Office ▪ BPPS as needed	*TBD: Costs associated with related missions, workshops, BPPS expertise etc. can be charged to the project budget.*	
Project Board meetings	▪ Project Board ▪ UNDP Country Office ▪ Project Manager	Per year: $1000 Or $6,000	At minimum annually
Supervision missions	▪ UNDP Country Office	None[66]	Two per year
Oversight missions	▪ UNDP-GEF team	None[67]	Troubleshooting as needed
GCF learning missions/site visits	▪ UNDP Country Office and Project Manager and UNDP-GEF team	None	To be determined
Interim Independent Evaluation (IIE) and management response	▪ UNDP Country Office and Project team and UNDP-GEF team	$30,000	Once at mid tem of the project
Final Independent Evaluation included in UNDP evaluation plan, and management response	▪ UNDP Country Office and Project team and UNDP-GEF team	$50,000	The Independent Final Evaluation Report is to be submitted to the GCF Secretariat 3 months before the scheduled end of the project
Translation of IIE and FIE reports into English	▪ UNDP Country Office	$7,000	As required. GCF will only accept reports in English.
TOTAL indicative COST Excluding project team staff time and UNDP staff and travel expenses		$ 205,000	

[66] The costs of UNDP Country Office and UNDP-GEF Unit's participation and time are charged to the GCF Agency Fee.

[67] The costs of UNDP Country Office and UNDP-GEF Unit's participation and time are charged to the GCF Agency Fee.

8. FINANCIAL PLANNING AND MANAGEMENT

The total cost of the project is USD 116,070,000 . This is financed through a GCF grant of USD 20,000,000, USD 420,000 in cash co-financing and USD 1,000,000 parallel co-financing to be administered by UNDP, USD 8,000,000 from the Yerevan Municipality, USD 400,000 from Government of Armenia along with USD 86,250.000 in parallel additional co-financing from EIB, as well as other funding sources available in the market. UNDP, as the GCF Accredited Agency, is responsible for the oversight and quality assurance of the execution of GCF resources and the cash co-financing transferred to UNDP bank account only.

The Accredited Entity's fee is not included in the GCF Proceeds.

(i) Project Financing

Component	Outputs	Financing institution			Total (million US$)
		GCF	Government	UNDP	
		Grant	Grant	Grant	
	1.1 MRV systems for the buildings sector in Armenia	0.650			
	1.2 Knowledge management and MRV information dissemination	0.240			
	2.1 Public instruments for the promotion of investment in energy efficiency	0.140			
	2.2 Support to ongoing legal reform in the field of energy efficiency	0.200			
	2.3 Support for the creation of an enabling policy framework for energy efficiency retrofits in multi-owner residential buildings	0.120			
	2.4 Support to building owners / managers / owner associations / ESCOs	0.280			
	2.5 Exit strategy	0.150			
	3.1 Technical assistance to banks and other financial institutions	0.850			
	3.2 Technical assistance to banks for Home-Owner Association (HOA) market facilitation	1.270			
	3.3 Technical assistance to local government to develop energy efficiency retrofit projects for publicly-owned buildings	0.870			
	3.4 Access to affordable capital for energy efficiency retrofits	0.000			

Component	Outputs	Financing institution			Total (million US$)
		GCF	Government	UNDP	
		Grant	Grant	Grant	
	3.5 Marketing platform	0.430			
Component 4. Financial Incentives	4.1 Targeted financial incentives provided to vulnerable groups	14.000	0.000		14.000
Project Management	Project Manager, assistant, travel, office running cost and office equipment, meetings of Project Board and Technical Advisory Committee, independent evaluation, financial audit and other project management costs.	0.800	0.100	0.210	1.110
Total		**20.000**	**8.400**	**1.420**	**29.820**

(ii) GCF Disbursement schedule

GCF grant funds will be disbursed according to the GCF disbursement schedule. The Country Office will submit an annual work plan to the UNDP-GEF Unit and comply with the GCF milestones in order for the next tranche of project funds to be released. All efforts must be made to achieve 80% delivery annually.

Please see the Indicative Disbursement Schedule below:

Disbursements	GCF proceeds (USD)	Indicative expected month and year of disbursement
Disbursement 1	729,000	July 2017
Disbursement 2	1,608,000	July 2018
Disbursement 3	3,596,000	July 2019
Disbursement 4	4,191,000	July 2020
Disbursement 5	5,358,000	July 2021
Disbursement 6	4,518,000	July 2022
Total	**20,000,000**	

In addition to Clause 18.02 of the AMA, UNDP covenants that as from the Effective Date of FAA it shall:

- Upon request by the GCF, inform the GCF on the status of the co-financing funds that have been disbursed and applied to the implementation of the Project activities;
- Upon the UNDP becoming aware of any commitment from financial institution(s) (such as the European Investment Bank) for the financing of energy efficiency retrofitting for private individual buildings and multiple flat housing complexes, as provided in the Funding Proposal, and as soon as possible, provide evidence of such commitment to the Fund;
- Within twenty four (24) months after the FAA Effective Date, procure an independent evaluator to conduct a technical review of outputs 1, 2 and 3 (as described in Project Results Framework), which will be financed by the UNDP, and carried out in accordance with the terms of reference to be provided by the GCF to the UNDP within two (2) months after the FAA Effective Date;
- Ensure that no GCF Proceeds disbursed by the GCF are used to finance the implementation of output 4 (as described in Project Results Framework) before receiving a written confirmation provided by the GCF that the results of the independent review referred to in Clause 9.02(c) of the FAA are satisfactory for implementation of output 4 (as described in Project Results Framework);

- Within sixty (60) months after the FAA Effective Date, submit a fully developed exit strategy in form and substance satisfactory to the GCF;
- Continuously screen and monitor potential environmental and social risks and impacts arising from the project using the Social and Environmental Screening Report based on the UNDP's environmental and social management system, for the relevant project; and
- Ensure that the legal agreements between the UNDP, GCF Executing Entity (Implementing Partner) and the Responsible Party are signed and effective prior to the Responsible Party involvement in the project.

(iii) Budget Revision and Tolerance

GCF requirement: 10% of the total projected costs per year can be reallocated among the budget account categories within the same project output. Any budget reallocation involving a major change in the project's scope, structure, design or objectives or any other change that substantially alters the purpose or benefit of the project requires the GCF's prior written consent.

UNDP requirement: As outlined in the UNDP POPP, the project board will agree on a budget tolerance level for each plan under the overall annual work plan allowing the project manager to expend up to the tolerance level beyond the approved project budget amount for the year without requiring a revision from the Project Board (within the GCF requirements noted above). Should such deviation occur, the Project Manager and UNDP Country office will seek the approval of the UNDP-GEF Unit.

Any over expenditure incurred beyond the available GCF grant amount will be absorbed by non-GCF resources (e.g. UNDP TRAC or cash co-financing).

(iv) Refund to GCF

Unspent GCF resources must be returned to the GCF. Should a refund of unspent funds to the GCF be necessary, this will be managed directly by the UNDP-GEF Unit in New York.

(v) Project Closure

Project closure will be conducted as per UNDP requirements outlined in the UNDP POPP.[68] On an exceptional basis only, a no-cost extension beyond the initial duration of the project will be sought from in-country UNDP colleagues and then the UNDP-GEF Executive Coordinator.

(vi) Operational completion

The project will be operationally completed when the last UNDP-financed inputs have been provided and the related activities have been completed. This includes the final clearance of the Final Independent Evaluation Report (that will be available in English) and the corresponding management response, and the end-of-project review Project Board meeting. The Implementing Partner through a Project Board decision will notify the UNDP Country Office when operational closure has been completed.

UNDP and the Implementing Partner agree that any durable assets or equipment purchased during the implementation of the project (such as vehicles or office equipment) will upon operational completion of the project be transferred to the Implementing Partner. Any funds or proceeds received from the sale of such assets will be transferred to the GCF.

(vii) Financial completion

The project will be financially closed when the following conditions have been met: a) The project is operationally completed or has been cancelled; b) The Implementing Partner has reported all financial transactions to UNDP; c) UNDP has closed the accounts for the project; d) UNDP and the Implementing Partner have certified a final Combined Delivery Report (which serves as final budget revision).

[68] see https://info.undp.org/global/popp/ppm/Pages/Closing-a-Project.aspx

The project is required to be financially completed within 12 months of operational closure or after the date of cancellation. Between operational and financial closure, the implementing partner will identify and settle all financial obligations and prepare a final expenditure report. The UNDP Country Office will send the final signed closure documents including confirmation of final cumulative expenditure and unspent balance to the UNDP-GEF Unit for confirmation before the project will be financially closed in Atlas by the UNDP Country Office.

9. TOTAL BUDGET AND WORKPLAN

Atlas Primary Output Project Title	De-risking and scaling up investment in energy efficient building retrofits
UNDP-GEF PIMS No.	5684
Implementing partner	Ministry of Nature Protection of Republic of Armenia

GCF Output / Atlas Activity	Responsible Party (Atlas Implementing Agent)	Financing Source	Budgetary Account Code	Budget Account Description	Amount Year 1 (USD)	Amount Year 2 (USD)	Amount Year 3 (USD)	Amount Year 4 (USD)	Amount Year 5 (USD)	Amount Year 6 (USD)	TOTAL (USD)	Budget Note
			71200	International Consultants	18,000	45,000	25,000	25,000	-	-	113,000	1
			71300	Local Consultants	35,000	40,000	35,000	35,000	35,000	35,000	215,000	2
			71400	Contractual Services - Individ	15,000	15,000	15,000	15,000	15,000	15,000	90,000	3
			72100	Contractual Services - Companies	30,000	30,000	40,000	40,000	40,000	35,000	215,000	4
			72200	Equipment and Furniture	50,000	4,000		-	-	-	54,000	5
			72400	Communic & Audio Visual Equip	10,000	20,000	3,000	3,000	3,000	3,000	42,000	6
			72800	Information Technology Equipmt	7,000	28,000	5,000	3,000	3,000	3,000	49,000	7
			73400	Rental & Maint of Other Equip	-	2,000	2,000	2,000	2,000	2,000	10,000	8
			74200	Audio Visual & Print Prod Costs	7,000	7,000	7,000	5,000	5,000	5,000	36,000	9
			74500	Miscellaneous Expenses	1,000	1,000	1,000	1,000	1,000	1,000	6,000	10
			75700	Training, Workshops and Conference	8,000	12,000	10,000	10,000	10,000	10,000	60,000	11

				GCF	181,000	204,000	143,000	139,000	114,000	109,000	890,000	
			71400	Contractual Services - Individ	-	17,000	17,000	17,000	17,000	17,000	85,000	12
			71600	Travel	4,000	3,000	3,000	3,000	3,000	3,000	19,000	13
			72100	Contractual Services - Companies	22,000	20,000	20,000	10,000			72,000	14
			75700	Training, Workshops and Conference	4,000	4,000	4,000	4,000	4,000	4,000	24,000	15
				UNDP	30,000	44,000	44,000	34,000	24,000	24,000	200,000	
				Total 1	**211,000**	**248,000**	**187,000**	**173,000**	**138,000**	**133,000**	**1,090,000**	
			71200	International Consultants	50,000	80,000	80,000	60,000	60,000	10,000	340,000	16
			71300	Local Consultants	35,000	45,000	45,000	45,000	30,000	5,000	205,000	17
			71400	Contractual Services - Individ	25,000	25,000	25,000	25,000	-	-	100,000	18
			71600	Travel	5,000	5,000	5,000	5,000	5,000	-	25,000	19
			72100	Contractual Services - Companies	25,000	30,000	25,000	25,000	-	-	105,000	20
			74200	Audio Visual & Print Prod Costs	8,000	8,000	6,000	6,000	5,000	3,000	36,000	21
			75700	Training, Workshops and Conference	8,000	15,000	18,000	18,000	10,000	10,000	79,000	22
				GCF	156,000	208,000	204,000	184,000	110,000	28,000	890,000	
				Total 2	**156,000**	**208,000**	**204,000**	**184,000**	**110,000**	**28,000**	**890,000**	
			71200	International Consultants	40,000	180,000	160,000	160,000	140,000	50,000	730,000	23
			71300	Local Consultants	40,000	120,000	120,000	130,000	120,000	60,000	590,000	24
			71400	Contractual Services - Individ	22,000	35,000	35,000	35,000	35,000	35,000	197,000	25

			71600	Travel	5,000	26,000	30,000	20,000	20,000	9,000	110,000	26
			72100	Contractual Services - Companies	190,000	260,000	300,000	320,000	320,000	120,000	1,510,000	27
			74200	Audio Visual & Print Prod Costs	-	20,000	40,000	40,000	30,000	20,000	150,000	28
			75700	Training, Workshops and Conference	8,000	35,000	30,000	20,000	20,000	20,000	133,000	29
				Total 3	**305,000**	**676,000**	**715,000**	**725,000**	**685,000**	**314,000**	**3,420,000**	
			72600	Grants	-	-	900,000	900,000	1,500,000	1,800,000	5,100,000	30
			72100	Contractual Services - Companies	-	400,000	1,500,000	2,100,000	2,800,000	2,100,000	8,900,000	31
				Total 4	**-**	**400,000**	**2,400,000**	**3,000,000**	**4,300,000**	**3,900,000**	**14,000,000**	
			71400	Contractual Services - Individ	50,000	63,000	63,000	63,000	63,000	63,000	365,000	32
			71600	Travel	5,000	5,000	5,000	5,000	5,000	5,000	30,000	33
			72400	Communic & Audio Visual Equip	5,000	6,000	5,000	5,000	5,000	4,000	30,000	34
			72800	Information Technology Equipmt	5,000	5,000	5,000	5,000	5,000	5,000	30,000	35
			74596	Services to Projects – GOE for CO	14,000	35,000	50,000	60,000	66,000	80,000	305,000	36
			75700	Training, Workshops and Conference	8,000	6,000	6,000	5,000	5,000	10,000	40,000	37
				GCF	87,000	120,000	134,000	143,000	149,000	167,000	800,000	
			71200	International Consultants	-	15,000	30,000	-	-	40,000	85,000	38
			71400	Contractual Services - Individ	15,000	12,000	12,000	10,000	9,000	9,000	67,000	39

		UNDP	72400	Communic & Audio Visual Equip	3,000	2,500	2,500	3,000	2,500	2,500	16,000	40
			72500	Supplies	2,000	2,000	2,000	2,000	2,000	2,000	12,000	41
			74100	Professional Services - Int	2,000	4,000	4,000	4,000	7,000	8,000	29,000	42
			74200	Audio Visual & Print Prod Costs	3,000	2,000	2,000	1,000			8,000	43
			74500	Miscellaneous Expenses	1,000	1,000	1,000	-	-	-	3,000	44
				UNDP	26,000	38,500	53,500	20,000	20,500	61,500	220,000	
				Total 5	**113,000**	**158,500**	**187,500**	**163,000**	**169,500**	**228,500**	**1,020,000**	
				Total GCF	729,000	1,608,000	3,596,000	4,191,000	5,358,000	4,518,000	**20,000,000**	
				Total Accredited Entity (cash)	56,000	82,500	97,500	54,000	44,500	85,500	**420,000**	
				Total Accredited Entity (parallel)							**1,000,000**	
				Total Government (MNP)							**400,000**	
				Total Yerevan Municipality							**8,000,000**	
				Total EIB							**86,250,000**	
				Grand Total							**116,070,000**	

Budget notes:

General Cost Factors

- Short-term national consultants (NC) are budgeted at US$ 500 per week.
- International consultants (IC) are budgeted at US$3000 per week.
- DSA's are budgeted at US$ 180 per day.
- International flight tickets are budgeted at US$ 1500 per round trip.
- Other expenses are based on UNDP standard costs.

No.	Description of cost item
	· International technical advisor support in localization of the international requirements for the MRV system
	· Supporting initiatives, including coordination with planned and parallel activities led by UNDP
	· Short-term local consultants hired to: collect and analyze information on institutional needs and capacity for implementation of commitments under convention, describe education, public awareness, capacity building, constraints and gaps
	· Short-term local consultants to identify capacity needs for technology transfer
3	· Expert team assistant to provide technical support to national and international experts, responsible for collection, compilation and editing technical reports, including training kits and fact sheets. Regular updates and drafting materials for communications
	· Local company for establishment of the MRV system related arrangements
	· Local company for MRV system information dissemination
	· Local company for developing and managing the website and advisory /information related to EE-specific portal
5	· Purchase of EMIS-related equipment, vehicle for EMIS equipment
6	· Communication costs -- internet, telephone. The project will purchase internet access and cover connectivity charges, purchase monitors and computers, and will include servers (for the MRV database). The MRV database will be established at the Ministry of Nature Protection and will require specific capacity servers meeting the requirements to host the database and link with the municipalities.
7	· Information technology supplies, which includes acquisition of technology hardware (hard disks, expansion disks), software and supplies (including printing supplies) related to establishing and operationalizing the building sector MRV
8	· Costs related to maintenance and operation of office and transportation equipment
9	· Translation, interpretation, publication, small video production, ads (hardcopy, videos, TV). All reports will be made available in national language and English. Trainings, workshops and conferences will include interpretation as appropriate to the stakeholders/recipients.
10	· Misc
11	· Organization/participation in meetings, workshops, stakeholder consultations for establishment of reliable, transparent MRV system for overall project and each site specific data
12	· Short-term local consultants to identify capacity needs for technology transfer
13	· Travel costs for in and out of country travel for international and national consultants
14	· Supporting initiatives, including coordination with planned and parallel activities led by UNDP
15	· Supporting initiatives, including coordination with planned and parallel activities led by UNDP related to knowledge management, information transfer
	· International consultant for Localization of international best practice

	· International consultant for supporting the development of the exit strategy
	· Long term local technical support for de-risking initiatives
	· Local consultant for supporting the development of the exit strategy
	· Project manager to share expert task (40%) to provide expert backstopping on the legal/institutional enabling framework for the retrofit activities in public and residential buildings
	· Consultants for development of legal-regulatory package
	· Consultants for legal advice
19	· Travel costs for in and out of country travel for international and national consultants
20	· Local companies for development of legal-regulatory package
21	· Translation, interpretation, publication, small video production, ads (hardcopy, videos, TV). All reports will be made available in national language and English. Trainings, workshops and conferences will include interpretation as appropriate to the stakeholders/recipients.
22	· Organization/participation in meetings, workshops, stakeholder consultations
	· International consultant for assisting the team with on-call advice
	· Support to public building EE retrofits
	· Assisting of implementation of public buildings' energy efficiency financing
	· International consultants to develop marketing platform
	· Support for development of financial instruments for individual households
	· Development of business plans for project stakeholder HoAs
	· Development of verification and validation related activities
	· National consultants to work on implementation of public building energy efficiency financing
	· Local consultant to develop marketing platform
	· Financial consultant to be hired under service contract modality
	· Local adviser on energy audit
	· Local adviser on EE finance
	· Project consultant on PR, outreach and marketing platform
26	· Travel costs for in and out of country travel for international and national consultants
	· Local companies for development of marketing products
	· Local companies for development of de-risking schemes
	· Development of energy audits
	· Development of financial instruments
	· Local companies to support marketing platform implementation
	Note that this will include work by companies that are the intermediaries (ESCOs and HOAs) who will be prototyping financial de-risking instruments, and also the marketing and financial advisory companies who will be providing specialized support. These companies are not preselected, but will be selected via a competitive procurement process consistent with the specific needs of residential and public buildings, therefore we cannot provide a breakdown by each company. However, we can provide the breakdown by company type: de-risking for USD 1,000,000 and marketing and financial advisory USD 510,000.

28	· Translation, interpretation, publication etc. related costs. The preparation of financial documentation and review of international documentation will require translation. This will require specialized translators and interpreters, with higher specific costs. Further, the project will be producing manuals (which will include both translation and printing costs). Advertisements targeted at households or bank clients (individuals or ESCOs) will be prepared and launched, and short videos will be produced for running within participating local banks targeting their customers.
29	· Costs associated with organization/participation in meetings, workshops, stakeholder consultations
30	· Micro-capital grants to Home-owners Associations (HOAs) that have NGO status in Armenia, for retrofits totalling ~$150k per set of buildings overseen by different HOAs. Grants will have to follow the UNDP Micro-Capital Grants policy.
	· Contractual services providing implementation of incentive programme with ESCOs - public sector
	· Contractual services providing implementation of incentive programme with ESCOs - residential sector
32	· Project manager
33	· Travel costs for in and out of country travel for international and national consultants
34	· Communication costs -- internet, telephone
35	· Office IT equipment
36	· Direct project costs - support services. For full details see UNDP Project Document, Annex 2, Attachment 1 'Description of UNDP Country Office Support Services'
37	· Costs associated with organization/participation in meetings, workshops, stakeholder consultations. Training will be provided on project management, reporting and related learning costs (e.g. tax requirements, procurement rules). This will not be used for UNDP internal costs.
38	· International consultants hired to undertake the initial review, Interim Independent Evaluation and final evaluations
39	· Driver
40	· Office communication expenses
41	· Stationery and other office supplies
42	· Project financial audit
43	· Translation, interpretation, publication. All reports will be made available in national language and English. Meetings will include interpretation as appropriate to the stakeholders/recipients.
44	· Miscellaneous

The detailed timetable of project implementation is provided in Annex 10. Overall project workplan is provided in the table below.

Table 6. The project overall workplan

	Yr1 Q1	Yr1 Q2	Yr1 Q3	Yr1 Q4	Yr2	Yr3	Yr4	Yr5	Yr6
Project Inception									
Component 1: MRV									
Component 2: Policy de-risking									
Component 3: Financial de-risking									
Component 4: Financial incentives									
Interim Independent Evaluation and final independent evaluation									

10. LEGAL CONTEXT

i. Additional legal conditions

Any designations on maps or other references employed in this project document do not imply the expression of any opinion whatsoever on the part of UNDP concerning the legal status of any country, territory, city or area or its authorities, or concerning the delimitation of its frontiers or boundaries.

By signing this UNDP GCF project document, the Implementing Partner also agrees to the terms and conditions of the GCF Funded Activity Agreement (FAA) included in Annex 1 and to use the GCF funds for the purposes for which they were provided. UNDP has the right to terminate this project should the Implementing Partner breach the terms of the GCF FFA.

ii. Legal Context Standard Clauses

This project document shall be the instrument referred to as such in Article 1 of the Standard Basic Assistance Agreement between the Government of Armenia and UNDP, signed on 8 March 1995.[69] All references in the SBAA to "Executing Agency" shall be deemed to refer to "Implementing Partner."

This project will be implemented by Ministry of Nature Protection of Republic of Armenia "Implementing Partner") in accordance with its financial regulations, rules, practices and procedures only to the extent that they do not contravene the principles of the Financial Regulations and Rules of UNDP. Where the financial governance of an Implementing Partner does not provide the required guidance to ensure best value for money, fairness, integrity, transparency, and effective international competition, the financial governance of UNDP shall apply.

iii. Risk Management

Consistent with the Article III of the SBAA [or the Supplemental Provisions to the Project Document], the responsibility for the safety and security of the Implementing Partner and its personnel and property, and of UNDP's property in the Implementing Partner's custody, rests with the Implementing Partner. To this end, the Implementing Partner shall:

a) 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;
b) assume all risks and liabilities related to the Implementing Partner'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 the Implementing Partner's obligations under this Project Document.

The Implementing Partner agrees to undertake all reasonable efforts to ensure that no UNDP funds received pursuant to the Project Document are used to provide support to individuals or entities associated with terrorism and that the recipients of any amounts provided by UNDP hereunder do not appear on the list maintained by the Security Council Committee established pursuant to resolution 1267 (1999). The list can be accessed via http://www.un.org/sc/committees/1267/aq_sanctions_list.shtml.

Social and environmental sustainability will be enhanced through application of the UNDP Social and Environmental Standards (http://www.undp.org/ses) and related Accountability Mechanism (http://www.undp.org/secu-srm).

The Implementing Partner shall: (a) conduct project and programme-related activities in a manner consistent with the UNDP Social and Environmental Standards, (b) implement any management or mitigation plan prepared for the project or programme to comply with such standards, and (c) engage

[69] http://www.ilo.int/dyn/legprot/en/f?p=2200:10002:29170441350755::NO:10002:P10002_COUNTRY_ID:102540:NO

in a constructive and timely manner to address any concerns and complaints raised through the Accountability Mechanism. UNDP will seek to ensure that communities and other project stakeholders are informed of and have access to the Accountability Mechanism.

All signatories to the Project Document shall cooperate in good faith with any exercise to evaluate any programme or project-related commitments or compliance with the UNDP Social and Environmental Standards. This includes providing access to project sites, relevant personnel, information, and documentation.

The Implementing Partner will take appropriate steps to prevent misuse of funds, fraud or corruption, by its officials, consultants, responsible parties, subcontractors and sub-recipients in implementing the project or using UNDP funds. The Implementing Partner will ensure that its financial management, anti-corruption and anti-fraud policies are in place and enforced for all funding received from or through UNDP.

The requirements of the following documents, then in force at the time of signature of the Project Document, apply to the Implementing Partner: (a) UNDP Policy on Fraud and other Corrupt Practices and (b) UNDP Office of Audit and Investigations Investigation Guidelines. The Implementing Partner agrees to the requirements of the above documents, which are an integral part of this Project Document and are available online at www.undp.org.

In the event that an investigation is required, UNDP has the obligation to conduct investigations relating to any aspect of UNDP projects and programmes. The Implementing Partner shall provide its full cooperation, including making available personnel, relevant documentation, and granting access to the Implementing Partner's (and its consultants', responsible parties', subcontractors' and sub-recipients') premises, for such purposes at reasonable times and on reasonable conditions as may be required for the purpose of an investigation. Should there be a limitation in meeting this obligation, UNDP shall consult with the Implementing Partner to find a solution.

The signatories to this Project Document will promptly inform one another in case of any incidence of inappropriate use of funds, or credible allegation of fraud or corruption with due confidentiality.

Where the Implementing Partner becomes aware that a UNDP project or activity, in whole or in part, is the focus of investigation for alleged fraud/corruption, the Implementing Partner will inform the UNDP Resident Representative/Head of Office, who will promptly inform UNDP's Office of Audit and Investigations (OAI). The Implementing Partner shall provide regular updates to the head of UNDP in the country and OAI of the status of, and actions relating to, such investigation.

UNDP shall be entitled to a refund from the Implementing Partner of any funds provided that have been used inappropriately, including through fraud or corruption, or otherwise paid other than in accordance with the terms and conditions of the Project Document. Such amount may be deducted by UNDP from any payment due to the Implementing Partner under this or any other agreement.

Where such funds have not been refunded to UNDP, the Implementing Partner agrees that donors to UNDP (including the Government) whose funding is the source, in whole or in part, of the funds for the activities under this Project Document, may seek recourse to the Implementing Partner for the recovery of any funds determined by UNDP to have been used inappropriately, including through fraud or corruption, or otherwise paid other than in accordance with the terms and conditions of the Project Document.

Note: The term "Project Document" as used in this clause shall be deemed to include any relevant subsidiary agreement further to the Project Document, including those with responsible parties, subcontractors and sub-recipients.

Each contract issued by the Implementing Partner in connection with this Project Document shall include a provision representing that no fees, gratuities, rebates, gifts, commissions or other payments, other than those shown in the proposal, have been given, received, or promised in connection with the

selection process or in contract execution, and that the recipient of funds from the Implementing Partner shall cooperate with any and all investigations and post-payment audits.

Should UNDP refer to the relevant national authorities for appropriate legal action any alleged wrongdoing relating to the project, the Government will ensure that the relevant national authorities shall actively investigate the same and take appropriate legal action against all individuals found to have participated in the wrongdoing, recover and return any recovered funds to UNDP.

The Implementing Partner shall ensure that all of its obligations set forth under this section entitled “Risk Management” are passed on to each responsible party, subcontractor and sub-recipient and that all the clauses under this section entitled “Risk Management Standard Clauses” are included, mutatis mutandis, in all sub-contracts or sub-agreements entered into further to this Project Document.

11. MANDATORY ANNEXES

The following documents are mandatory annexes and must be included as part of the final project document package. These documents must be posted to open.undp.org, and can also be posted to the UNDP County Office website as appropriate.

1. GCF Funding Activity Agreement and Notice of Effectiveness
2. Direct project cost letter of agreement – Standard letter of agreement between UNDP and the Government for the provision of Services
3. Letter of agreement between the Implementing Partner and Responsible Parties
4. Letters of co-financing
5. Social and environmental screening procedure and management plan
6. Gender analysis and action plan
7. Map of project location(s) with GPS Coordinates
8. Monitoring Plan
9. Evaluation Plan
10. Timetable of project implementation
11. Procurement plan
12. Terms of reference for Project staff
13. UNDP Project Quality Assurance Report
14. UNDP Risk Log
15. Results of the capacity assessment of the project implementing partner and HACT micro assessment
16. Technical, economic and financial analysis
17. Theory of Change
18. GHG reduction calculations
19. Project activities and inputs

Annex 1. GCF Funding Activity Agreement and Notice of Effectiveness

GREEN CLIMATE FUND

GCF
FUNDED ACTIVITY AGREEMENT
(GRANTS)

between

UNITED NATIONS DEVELOPMENT PROGRAMME

and

GREEN CLIMATE FUND

FUNDED ACTIVITY: FP010 "De-risking and scaling up investment in energy efficient building retrofits"

Dated 7th June 2017

GREEN CLIMATE FUND

TABLE OF CONTENTS

GREEN CLIMATE FUND

Funded Activity Agreement (Grants)

This FUNDED ACTIVITY AGREEMENT (the "**FAA**" or this "**Agreement**") dated 7th June 2017 between:

UNITED NATIONS DEVELOPMENT PROGRAMME, an international organization established by the General Assembly of the United Nations pursuant to its resolution 2029(XX) of 22 November 1965 and having its registered office at One UN Plaza, New York, New York 10017, United States of America (the "**Accredited Entity**" or "**UNDP**"); and

THE GREEN CLIMATE FUND, designated as an operating entity of the financial mechanism under Article 11 of the United Nations Framework Convention on Climate Change and established pursuant to the Governing Instrument for the Green Climate Fund, approved by the COP at its seventeenth session, on 11 December 2011, and is annexed to Decision 3/CP.17, possessing juridical personality in order to operate effectively internationally, having such legal capacity as is necessary for the exercise of its functions and the protection of its interests and having its headquarters at Songdo, Incheon, Republic of Korea ("**GCF**" or the "**Fund**"),

each a "**Party**" and together the "**Parties**".

WHEREAS

(A) The Accredited Entity and the GCF entered into an accreditation master agreement on 5 August 2016 (the "**AMA**"), which sets forth, amongst others, the general terms and conditions applicable between the Parties in connection with a funded activity;

(B) In accordance with Clause 4.11 of the AMA, the Accredited Entity has submitted to the Fund a funding proposal, which is attached to this Agreement as Annex 1 (the "**Funding Proposal**") requesting funding for the activity described therein (the "**Funded Activity**" or "**Project**");

(C) The NDA of the Host Country has issued the No-Objection Letter dated 4 September 2015 with respect to the Funding Proposal;

(D) The Board of the Fund, by its decision B.13/23 ("**Approval Decision**"), approved the Funding Proposal in the amount of USD 20,000,000 (twenty million US Dollars), contingent on the fulfilment of the conditions and with due consideration of the recommendations as contained in annex III, "List of conditions and recommendations" to the Approval Decision; and

(E) In accordance with Clause 6.02 of the AMA, the Parties now wish to enter into this Agreement in order to set out the agreed terms for the implementation of the Funded Activity.

THE PARTIES HEREBY AGREE AS FOLLOWS:

Clause 1. Definitions; AMA

1.01 The terms of the AMA are incorporated in, and form part of, this Agreement and pursuant to Clauses 1.02 and 1.03 of the AMA, any derogations from, deviations or modifications to the AMA in relation to the Funded Activity are set forth in this Agreement. In case of termination of the AMA, its terms as incorporated in this Agreement shall continue to apply.

1.02 In the event of a conflict between:

(a) The terms and conditions in the Clauses of this Agreement and the terms and conditions of any of its Schedules or Annex, the terms and conditions in the Clauses of the Agreement shall prevail; and

(b) The terms and conditions in the Schedules to this Agreement and the terms and conditions in the Annex to this Agreement, the terms and conditions in the Schedules shall prevail.

1.03 Wherever used in this Agreement, terms defined in the AMA shall have the respective meanings therein set forth unless modified herein or the context otherwise requires. Additional terms used in this Agreement shall have the following meanings:

(a) "**Accredited Entity Fee**" shall have the meaning ascribed to it in Clause 4 of this Agreement;

(b) "**Budget**" means the costs of the Funded Activity and the breakdown thereof, as set out in Part A of Schedule 2 to this Agreement;

(c) "**Civil Works**" means all types of civil, mechanical, electrical or other engineering services (other than consulting services) as well as the supply of construction materials and equipment to be financed out of the GCF Proceeds;

(d) "**Closing Date**" means the date which is five (5) years after the Effective Date (or such later date as the Fund shall establish by notice to the Accredited Entity), on which the Accredited Entity's right to receive GCF Proceeds to the GCF Account in respect of the Funded Activity will have terminated;

(e) "**Completion Date**" means the date which is no later than one (1) year after the Closing Date (except if otherwise agreed with the Fund);

(f) "**Disbursement Plan**" means the disbursement plan included in Part B of Schedule 2;

(g) "**Effective Date**" shall have the meaning ascribed to it in Clause 6.01 of this Agreement;

(h) "**Eligible Expenditures**" means any reasonable costs of Goods, Services, Civil Works or sub-grants to be financed out of the GCF Proceeds for the implementation of the Funded Activity in accordance with this Agreement, the AMA and the Funding Proposal;

(i) "**Executing Entity**" means the entity specified in Clause 2.02 of this Agreement;

(j) "**Funded Activity**" or "**Project**" shall have the meaning ascribed thereto in Recital (B);

(k) "**Funding Proposal**" shall have the meaning ascribed thereto in Recital (B);

(l) "**Grant**" means the GCF Proceeds in the amount specified in Clause 3.01 of this Agreement, as approved by the Board, which the Fund has decided to make

available for the Funded Activity, which shall be exclusive of the Accredited Entity Fee;

(m) "**Host Country**" means the Republic of Armenia;

(n) "**Implementation Arrangements**" mean the contractual arrangement(s) to be entered into and/or the administrative arrangement(s) to be established by the different parties involved in the implementation of the Funded Activity as set out in Schedule 3;

(o) "**Implementation Plan**" means the calendar for the implementation of the Funded Activity set forth in Schedule 5;

(p) "**Project Document**" means a document that the Accredited Entity enters into with the Host Country in accordance with the SBAA defining the detailed financial, procurement and implementation plans, and the respective responsibilities of the parties thereto in respect of the Funded Activity or an assistance. For the avoidance of doubt, the Project Document shall serve as the Subsidiary Agreement and shall reflect the requirements of this Agreement and the AMA, as applicable;

(q) "**Request for Disbursement**" means the template request for disbursement in Schedule 6 to this Agreement;

(r) "**Responsible Party**" means the Municipality of Yerevan;

(s) "**SBAA**" means Standard Basic Assistance Agreement between UNDP and the Government of the Republic of Armenia dated 8 March 1995; and

(t) "**Social and Environmental Screening Report**" means the social and environmental screening report provided by the Accredited Entity as an annex to the Funding Proposal, as set out in Annex 2.

1.04 Any references in this Agreement to "Clause", "Schedule" or "Annex" shall refer to a clause of, a schedule to or an annex to, this Agreement, unless otherwise specified or context requires otherwise.

Clause 2. The Funded Activity

2.01 The Accredited Entity shall monitor and supervise the implementation of the Funded Activity by the Executing Entity, and ensure that the Executing Entity will carry out the Funded Activity, with due diligence and efficiency and in conformity with appropriate financial, economic, social, environmental and administrative practices, and shall provide, promptly as needed, the funds, facilities, services and other resources required for the Funded Activity.

2.02 The Ministry of Nature Protection shall act as the Executing Entity for this Funded Activity, as further described in Schedule 3.

2.03 The Accredited Entity shall ensure that the obligations set out in this Agreement are observed and carried out by the Executing Entity pursuant to the Subsidiary Agreement, in accordance with the relevant provisions of the AMA.

2.04 Without prejudice to the provisions of Clause 2.01 above and except as the Accredited Entity and the Fund may otherwise agree, the Funded Activity shall be carried out in accordance with the Implementation Arrangements and within the timeframe set out in the Implementation Plan set forth in Schedule 5.

2.05 The implementation of all the activities of the Funded Activity shall be completed no later than the Completion Date and shall be subject to confirmation by the Fund based on the completion report to be provided in accordance with Schedule 4.

Clause 3. The Grant; Disbursements

3.01 Subject to the terms and conditions of this Agreement, the Fund agrees to make available to the Accredited Entity by or before the Closing Date, as set forth in the Disbursement Plan attached hereto as Part B of Schedule 2, an amount equal to USD 20,000,000 (twenty million US Dollars), which shall be disbursed by the Accredited Entity to the Executing Entity in the form of a grant for the purposes of and to assist in financing the Funded Activity.

3.02 The Grant shall be transferred, in accordance with the Disbursement Plan provided in Part B of Schedule 2, to the Accredited Entity upon the fulfillment by the Accredited Entity, to the satisfaction of the Fund, of the relevant conditions precedent to disbursement set forth in Clause 8 below. In accordance with this Clause 3.02, the Grant shall be transferred to the bank account to be notified by the Accredited Entity to the Fund in writing in the Request for Disbursement. For the avoidance of doubt, the GCF Account for the Funded Activity will be a ledger account.

3.03 The GCF Holding Currency for disbursements shall be USD.

3.04 The Accredited Entity shall make the proceeds of the Grant available to the Executing Entity in the form of a grant in accordance with the Project Document to be entered into between the Accredited Entity and the Executing Entity under the terms and conditions consistent with this Agreement and the AMA.

3.05 The Accredited Entity shall ensure that (a) the Grant will be used by the Executing Entity exclusively to finance the Eligible Expenditures, in accordance with the AMA and this Agreement, as set out in the Funding Proposal, and as further specified in the Budget; and (b) all the Eligible Expenditures shall be accrued by the Executing Entity before the Completion Date.

3.06 After the first disbursement by the Fund, all subsequent disbursements shall be subject to the expenditure of at least seventy per cent (70%) of the previous disbursements for the Eligible Expenditures.

3.07 The GCF Proceeds shall not be used to finance any costs incurred prior to the Effective Date.

3.08 The financial reporting and accounting currency for the Funded Activity shall be USD.

Clause 4. Accredited Entity Fee

4.01 The Accredited Entity's fee in relation to the Funded Activity shall be an amount equal to nine per cent (9%) of the aggregate amount of the GCF Proceeds used to finance Eligible Expenditures (the "**Accredited Entity Fee**").

4.02 ***Disbursement of the Accredited Entity Fee.*** The Accredited Entity Fee shall be paid in instalments at the time of each Grant disbursement. The amount of each instalment shall be equal to nine per cent (9%) of the related Grant disbursement. All such disbursement of the Accredited Entity Fee shall be paid together with the Grant disbursements and deposited into the bank account referred to in Clause 3.02 above.

4.03 The final instalment of the Accredited Entity Fee shall be an amount equal to the Accredited Entity Fee less all previous instalments of the Accredited Entity Fee paid to the Accredited Entity under this Clause 4.

4.04 If, after the Completion Date, the aggregate amount of the GCF Proceeds used to finance Eligible Expenditures is less than the amount referred to in Clause 3.01, the Accredited Entity shall, on thirty (30) days' written notice from the Fund, refund to the Fund the amount by which the total amount disbursed to the Accredited Entity under Clause 4.02 exceeds the Accredited Entity Fee, unless otherwise agreed by the Fund.

4.05 If the Fund decides to suspend Grant disbursements, in accordance with Clause 15.03 of the AMA, the Fund may also, at its own discretion, suspend the payment of Accredited Entity Fee.

Clause 5. Administration of Grant by the Accredited Entity

5.01 ***Permitted Reallocation.*** Any reallocation among the Funded Activity's outputs described in Part A of Schedule 2 resulting in a variation of more than ten per cent (10%) of the previously agreed budget for the output-from which the funds are to be reallocated must be approved in writing by the Fund in advance.

5.02 ***Taxation***. The tax exemptions accorded under the SBAA shall apply to Goods and Services procured with, and sub-grants financed out of the GCF Proceeds.

Clause 6. Effectiveness

6.01 This Agreement shall enter into effect on the date upon which the Fund dispatches to the Accredited Entity a notice of its acceptance of the evidence specified below ("**Effective Date**"):

(a) A duly authorized and executed copy of this Agreement by the Accredited Entity;

(b) A certificate issued by the Accredited Entity's most senior legal officer, in a form that is satisfactory to the Fund, certifying that this Agreement entered into by the Accredited Entity has been duly authorized or ratified by all necessary corporate actions, duly executed and delivered on behalf of the Accredited Entity, and is legally binding and enforceable upon the Accredited Entity in accordance with its terms;

(c) A certificate confirming the availability of the Accredited Entity's co-financing for the Funded Activity in the amount specified in the Funding Proposal; and

(d) An indicative disbursement schedule by the Accredited Entity indicating month and year for the disbursement of the GCF Proceeds by the Fund to the GCF Account for the implementation of the Funded Activity.

6.02 If, before the Effective Date, any event has occurred, which would entitle the Fund to suspend the right of the Accredited Entity to request disbursement if this Agreement had been effective, the Fund may postpone the dispatch of the notice referred to in this Clause 6 until such event (or events) has (or have) ceased to exist.

6.03 ***Termination for Failure to Become Effective***. This Agreement and all obligations of the Parties under it shall terminate if it has not entered into effect by the date which falls ninety (90) days after the date of this Agreement, unless the Fund, after consideration of the reasons for the delay and following consultations with the Accredited Entity, establishes a later date for the purpose of this Clause 6. The Fund shall promptly notify the Accredited Entity of such later date.

Clause 7. Reporting, Monitoring and Evaluation Schedule

7.01 The reporting, monitoring and evaluation of the Funded Activity shall be done in accordance with Schedule 4.

Clause 8. Conditions Precedent to Disbursement

8.01 The obligation of the Fund to disburse GCF Proceeds in connection with the Funded Activity under this Agreement shall be subject to the following conditions having been fulfilled to the satisfaction, in form and substance, of the Fund:

(a) *Conditions precedent to first disbursement*:

(i) Effectiveness of this Agreement;

(ii) Delivery to the Fund by the Accredited Entity of an executed copy of the Subsidiary Agreement, in the form of a Project Document, between the Accredited Entity and the Executing Entity; and

(iii) Completion of the detailed evaluation of the financial management capacity of the Municipality of Yerevan and the Environmental Project Implementation Unit of the Ministry of Nature Protection under the UNDP Framework for Cash Transfer to Implementing Partners as satisfactory to implement the Project.

(b) *Conditions precedent to the second disbursement:*

(i) Completion and submission to the GCF in form and substance satisfactory to the GCF and the Accredited Entity of an operational manual for the implementation of financial incentives under output 4 (as described in Schedule 1) identifying eligibility and selection criteria for the targeted beneficiaries.

(c) *General conditions for all disbursements*:

(i) Other than in relation to the first disbursement, submission of evidence by the Accredited Entity to the Fund that at least 70% (seventy per cent) of the funds previously disbursed have been spent for Eligible Expenditures;

(ii) Other than in relation to the first disbursement, submission by the Accredited Entity of APRs and financial information in accordance with the AMA;

(iii) Delivery of a Request for Disbursement, in accordance with the template attached hereto (Schedule 6), by the Accredited Entity, signed by the person or persons authorized to do so, within thirty (30) calendar days prior to the date on which the disbursement is requested to be made, which date of disbursement shall not be later than the Closing Date; and

(iv) Delivery to the Fund by the Accredited Entity of evidence, satisfactory to the Fund, of the authority of the person or persons authorized to sign each Request for Disbursement and the authenticated specimen signature of each such person.

Clause 9. Additional Representations, Warranties and Covenants of the Accredited Entity

9.01 In addition to Clause 18.01 of the AMA, the Accredited Entity represents and warrants that:

(a) On the date of the execution of this Agreement and the date of each disbursement made by the Fund under this Agreement, there are no circumstances of which the Accredited Entity is aware, including through its oversight of the Project as per the obligations of this FAA, the AMA and UNDP's own policies and practices, that may substantially interfere with the performance of the Accredited Entity's obligations under this Agreement, the AMA or with the implementation of the Funded Activity, or otherwise jeopardize the achievements of any objectives, outcomes or outputs of the Funded Activity; and

(b) On the date of the first disbursement by the Fund under this Agreement and throughout the term of this Agreement, the Subsidiary Agreement remains in effect.

9.02 In addition to Clause 18.02 of the AMA, the Accredited Entity covenants that as from the Effective Date of this Agreement it shall:

(a) Upon request by the Fund, inform the Fund on the status of the co-financing funds that have been disbursed and applied to the implementation of the Project activities;

(b) Upon the Accredited Entity becoming aware of any commitment from financial institution(s) (such as the European Investment Bank) for the financing of energy efficiency retrofitting for private individual buildings and multiple flat housing complexes, as provided in the Funding Proposal, and as soon as possible, provide evidence of such commitment to the Fund;

(c) Within twenty four (24) months after the Effective Date, procure an independent evaluator to conduct a technical review of outputs 1, 2 and 3 (as described in Schedule 1), which will be financed by the Accredited Entity, and carried out in accordance with the terms of reference to be provided by the Fund to the Accredited Entity within two (2) months after the Effective Date;

(d) Ensure that no GCF Proceeds disbursed by the Fund are used to finance the implementation of output 4 (as described in Schedule 1) before receiving a written confirmation provided by the Fund that the results of the independent review referred to in Clause 9.02(c) above are satisfactory for implementation of output 4 (as described in Schedule 1);

(e) Within sixty (60) months after the Effective Date, submit a fully developed exit strategy in form and substance satisfactory to the Fund;

(f) Continuously screen and monitor potential environmental and social risks and impacts arising from the Funded Activity using the Social and Environmental Screening Report based on the Accredited Entity's environmental and social management system, for the relevant Funded Activity; and

(g) Ensure that the legal agreements between the Accredited Entity, Executing Entity and the Responsible Party are signed and effective prior to the Responsible Party involvement in the Funded Activity.

9.03 Pursuant to Clause 23.04 of the AMA, the Accredited Entity shall inform the Fund, in the final APR, which steps it intends to take in relation to the durable assets and/or equipment purchased with the GCF Proceeds to implement the Funded Activity.

Clause 10. Additional Remedies to the Fund

10.01 ***Events of Default***. In addition to Clause 19 of the AMA, the following events shall constitute an event of default of the AMA and this Agreement:

(a) The Accredited Entity has failed to comply, in any material respect with, or shall have failed to perform in any material respects, any of its obligations under this Agreement.

10.02 ***Remedies/consequences of default.*** If there is an event of default under this Agreement, Clause 20 of the AMA shall apply to this Agreement *mutatis mutandis*.

Clause 11. Step-in Rights

11.01 In the event the Fund exercises its rights under Clauses 20.01(c), 22.01 and 22.03 of the AMA, the Accredited Entity shall execute such documents and take such steps as are reasonably necessary to enable the Fund to give effect to such provisions.

Clause 12. Applicable Law; Dispute Resolution

12.01 Clauses 28 and 29 of the AMA apply to this Agreement *mutatis mutandis.*

Clause 13. Designated Authority; Notices

13.01 Any notice, request, document, report, or other communication submitted by either the Accredited Entity or the Fund, shall unless expressly specified in this Agreement, be in English and delivered by hand or by facsimile or email to the Party to which it is required or permitted to be given or made to the following addresses:

For the Accredited Entity:

Attn: Director, Global Environmental Finance, Bureau for Policy and Programme Support
Address: One United Nations Plaza
New York, NY 10017
United States of America
Fax: +1 212 906 6998
Email: adriana.dinu@undp.org

For the Fund:

Attn: Division of Mitigation and Adaptation
Address: G-Tower, 175, Art Center-daero
Yeonsu-gu, Incheon 22004
Republic of Korea
Fax: +82 32 458 6092
Email: fundingproposal@gcfund.org

Clause 14. Miscellaneous

14.01 ***Assignment; Novation.*** The Accredited Entity will not be entitled to assign or otherwise transfer its rights and obligations under this Agreement, in full or in part, without the prior written consent of the Fund, which consent may be granted or not granted at the Fund's absolute discretion.

14.02 ***Failure to Exercise Rights.*** No delay in exercising, or omission to exercise, any right, power or remedy accruing to any Party under this Agreement upon any default shall impair any such right, power or remedy or be construed to be a waiver thereof or an acquiescence in such default. No action of such Party in respect of any default, or any acquiescence by it in any default, shall affect or impair any right, power or remedy of such Party in respect of any other or subsequent default.

14.03 ***Execution in Counterparts.*** This Agreement may be executed in two counterparts, each of which shall be an original.

14.04 ***Rights of Third Parties***. This Agreement is intended solely for the benefit of the Parties and is not intended to be for the benefit of, nor may any provision be enforced by, any person or entity that is not a party to this Agreement. Any other statute or law to the contrary is hereby excluded or disapplied.

14.05 ***Entire Agreement.*** This Agreement constitutes the entire agreement and understanding of the Parties with respect to its subject matter and supersedes all oral communication and prior *writings* with respect thereto, other than those writings expressly referred to or incorporated into this Agreement entered into hereunder, including the AMA.

14.06 ***Modification or Amendment***. No modification or amendment of this Agreement shall be valid unless in writing and signed by an authorized representative of the Fund and an authorized representative of the Accredited Entity.

14.07 ***Relationship of the Parties.*** Nothing contained in this Agreement shall be deemed or construed as creating a principal-agent relationship between the Parties hereto or be construed to evidence the intention of the Parties to constitute such. Neither Party shall have any express or implied right or authority to assume or create any obligations on behalf of or in the name of the other Party or to bind the other Party to any contract, agreement or undertaking with any third party.

14.08 ***Severability.*** If any term of this Agreement is to any extent invalid, illegal, or incapable of being enforced, such term shall be excluded to the extent of such invalidity, illegality, or unenforceability; all other terms hereof shall remain in full force and effect.

14.09 ***Survival:*** Clause 12.01 of this Agreement shall, unless explicitly provided otherwise, survive for a period of five (5) years after the termination of this Agreement.

GREEN CLIMATE FUND

IN WITNESS WHEREOF the parties hereto, acting through their representatives thereunto duly authorized, have caused this Agreement to be signed in their respective names as of the day and year first above written and to be delivered at the principal office of the Fund.

UNITED NATIONS DEVELOPMENT PROGRAMME

By _____ Date 6th June 2017
Name: Adriana Dinu
Designation: Director, Global Environmental Finance, Bureau for Policy and Programme Support

GREEN CLIMATE FUND

By _____ O.i.C SMA Date 7th June 2017
Name: German Jerry Velasquez
Designation: Director of Mitigation and Adaptation

Schedule 1. Description of Funded Activity

The description of the Funded Activity is included in the Funding Proposal attached herein as Annex 1. The implementation of the Funded Activity will be carried out in accordance with the table below:

Component	Outputs	Activities
De-risking and scaling up investment in energy efficient building retrofits	1. Establishment of Building Sector MRV	1.1 MRV systems for the buildings sector in Armenia established
		1.2 Knowledge management and MRV information disseminated
	2. Policy De-Risking	2.1 Public instruments for the promotion of investment in EE selected
		2.2 Support provided to on-going legal reform in the field of EE
		2.3 Support provided for the creation of an enabling policy framework for EE retrofits in multi-owner residential buildings
		2.4 Support provided to building owners/managers/owner associations/ ESCOs on legal matters related to EE retrofit projects
		2.5 Exit strategy measures implemented
	3. Financial De-Risking	3.1 Technical assistance provided to banks and other financial institutions
		3.2 Technical assistance provided to banks for HOA market facilitation
		3.3 Technical assistance provided to local government to develop EE retrofit projects for publicly-owned buildings
		3.4 Access to affordable capital for EE retrofits provided
		3.5 Marketing platform created
	4. Financial Incentives	4.1 Targeted financial incentives provided to vulnerable groups to help address the affordability gap

GREEN CLIMATE FUND

Schedule 2. Budget and Disbursement Plan

A. Budget: Costs per Component/Breakdown

Component	GCF Output / Atlas Activity	Responsible Party (Atlas Implementing Agent)	Financing Source	Budgetary Account Code	Budget Account Description	Amount Year 1 (USD)	Amount Year 2 (USD)	Amount Year 3 (USD)	Amount Year 4 (USD)	Amount Year 5 (USD)	Amount Year 6 (USD)	TOTAL (USD)	Budget Note*
De-risking and scaling up investment in energy efficient building retrofits	1. Establishment of building sector MRV and knowledge management	MNP	GCF	71200	International Consultants	18,000	45,000	25,000	25,000	-	-	113,000	1
				71300	Local Consultants	35,000	40,000	35,000	35,000	35,000	35,000	215,000	2
				71400	Contractual Services – Individ	15,000	15,000	15,000	15,000	15,000	15,000	90,000	3
				72100	Contractual Services – Companies	30,000	30,000	40,000	40,000	40,000	35,000	215,000	4
				72200	Equipment and Furniture	50,000	4,000		-	-		54,000	5
				72400	Communic & Audio Visual Equip	10,000	20,000	3,000	3,000	3,000	3,000	42,000	6
				72800	Information Technology Equipmt	7,000	28,000	5,000	3,000	3,000	3,000	49,000	7
				73400	Rental & Maint of Other Equip	-	2,000	2,000	2,000	2,000	2,000	10,000	8
				74200	Audio Visual & Print Prod Costs	7,000	7,000	7,000	5,000	5,000	5,000	36,000	9
				74500	Miscellaneous Expenses	1,000	1,000	1,000	1,000	1,000	1,000	6,000	10
				75700	Training, Workshops and Conference	8,000	12,000	10,000	10,000	10,000	10,000	60,000	11
					GCF	**181,000**	**204,000**	**143,000**	**139,000**	**114,000**	**109,000**	**890,000**	
			Accredited Entity	71400	Contractual Services – Individ	-	17,000	17,000	17,000	17,000	17,000	85,000	12
				71600	Travel	4,000	3,000	3,000	3,000	3,000	3,000	19,000	13
				72100	Contractual Services – Companies	22,000	20,000	20,000	10,000			72,000	14
				75700	Training, Workshops and Conference	4,000	4,000	4,000	4,000	4,000	4,000	24,000	15
					UNDP	**30,000**	**44,000**	**44,000**	**34,000**	**24,000**	**24,000**	**200,000**	
					Total 1	**211,000**	**248,000**	**187,000**	**173,000**	**138,000**	**133,000**	**1,090,000**	
	2. Policy de-risking	MNP	GCF	71200	International Consultants	50,000	80,000	80,000	60,000	60,000	10,000	340,000	16
				71300	Local Consultants	35,000	45,000	45,000	45,000	30,000	5,000	205,000	17
				71400	Contractual Services – Individ	25,000	25,000	25,000	25,000	-	-	100,000	18
				71600	Travel	5,000	5,000	5,000	5,000	5,000	-	25,000	19
				72100	Contractual Services – Companies	25,000	30,000	25,000	25,000	-	-	105,000	20
				74200	Audio Visual & Print Prod Costs	8,000	8,000	6,000	6,000	5,000	3,000	36,000	21
				75700	Training, Workshops and Conference	8,000	15,000	18,000	18,000	10,000	10,000	79,000	22
					GCF	**156,000**	**208,000**	**204,000**	**184,000**	**110,000**	**28,000**	**890,000**	
					Total 2	**156,000**	**208,000**	**204,000**	**184,000**	**110,000**	**28,000**	**890,000**	
	3. Financial de-risking	MNP	GCF	71200	International Consultants	40,000	180,000	160,000	160,000	140,000	50,000	730,000	23
				71300	Local Consultants	40,000	120,000	120,000	130,000	120,000	60,000	590,000	24

				71400	Contractual Services – Individ	22,000	35,000	35,000	35,000	35,000	35,000	197,000	25
				71600	Travel	5,000	26,000	30,000	20,000	20,000	9,000	110,000	26
				72100	Contractual Services – Companies	190,000	260,000	300,000	320,000	320,000	120,000	1,510,000	27
				74200	Audio Visual & Print Prod Costs	-	20,000	40,000	40,000	30,000	20,000	150,000	28
				75700	Training, Workshops and Conference	8,000	35,000	30,000	20,000	20,000	20,000	133,000	29
					Total 3	**305,000**	**676,000**	**715,000**	**725,000**	**685,000**	**314,000**	**3,420,000**	
	4. Financial incentives	MNP	GCF	72600	Grants	-	-	900,000	900,000	1,500,000	1,800,000	5,100,000	30
				72100	Contractual Services – Companies	-	400,000	1,500,000	2,100,000	2,800,000	2,100,000	8,900,000	31
					Total 4	-	**400,000**	**2,400,00**	**3,000,00**	**4,300,00**	**3,900,000**	**14,000,00**	
	5. Project management	UNDP	GCF	71400	Contractual Services – Individ	50,000	63,000	63,000	63,000	63,000	63,000	365,000	32
				71600	Travel	5,000	5,000	5,000	5,000	5,000	5,000	30,000	33
				72400	Communic & Audio Visual Equip	5,000	6,000	5,000	5,000	5,000	4,000	30,000	34
				72800	Information Technology Equipmt	5,000	5,000	5,000	5,000	5,000	5,000	30,000	35
				74596	DPC	14,000	35,000	50,000	60,000	66,000	80,000	305,000	36
				75700	Training, Workshops and Conference	8,000	6,000	6,000	5,000	5,000	10,000	40,000	37
					GCF	**87,000**	**120,000**	**134,000**	**143,000**	**149,000**	**167,000**	**800,000**	
			Accredited Entity	71200	International Consultants	-	15,000	30,000	-	-	40,000	85,000	38
				71400	Contractual Services – Individ	15,000	12,000	12,000	10,000	9,000	9,000	67,000	39
				72400	Communic & Audio Visual Equip	3,000	2,500	2,500	3,000	2,500	2,500	16,000	40
				72500	Supplies	2,000	2,000	2,000	2,000	2,000	2,000	12,000	41
				74100	Professional Services – Int	2,000	4,000	4,000	4,000	7,000	8,000	29,000	42
				74200	Audio Visual & Print Prod Costs	3,000	2,000	2,000	1,000			8,000	43
				74500	Miscellaneous Expenses	1,000	1,000	1,000	-	-	-	3,000	44
					UNDP	**26,000**	**38,500**	**53,500**	**20,000**	**20,500**	**61,500**	**220,000**	
					Total 5	**113,000**	**158,500**	**187,500**	**163,000**	**169,500**	**228,500**	**1,020,000**	
Total GCF						**729,000**	**1,608,000**	**3,596,000**	**4,191,000**	**5,358,000**	**4,518,000**	**20,000,000**	
Total Accredited Entity (cash)						**56,000**	**82,500**	**97,500**	**54,000**	**44,500**	**85,500**	**420,000**	
Total Accredited Entity (parallel)												**1,000,000**	
Total Government (MNP)												**400,000**	
Total Yerevan Municipality												**8,000,000**	
Total EIB												**86,250,000**	
Grand Total												**116,070,000**	

No.	Description of cost item
1	• International technical advisor support in localization of the international requirements for the MRV system • Supporting initiatives, including coordination with planned and parallel activities led by UNDP
2	• Short-term local consultants hired to: collect and analyze information on institutional needs and capacity for implementation of commitments under convention, describe education, public awareness, capacity building, constraints and gaps • Short-term local consultants to identify capacity needs for technology transfer
3	• Expert team assistant to provide technical support to national and international experts, responsible for collection, compilation and editing technical reports, including training kits and fact sheets. Regular updates and drafting materials for communications
4	• Local company for establishment of the MRV system related arrangements • Local company for MRV system information dissemination • Local company for developing and managing the website and advisory/information related to EE-specific portal
5	• Purchase of EMIS-related equipment, vehicle for EMIS equipment
6	• Communication costs -- internet, telephone. The project will purchase internet access and cover connectivity charges, purchase monitors and computers, and will include servers (for the MRV database). The MRV database will be established at the Ministry of Nature Protection and will require specific capacity servers meeting the requirements to host the database and link with the municipalities.
7	• Information technology supplies, which includes acquisition of technology hardware (hard disks, expansion disks), software and supplies (including printing supplies) related to establishing and operationalizing the building sector MRV
8	• Costs related to maintenance and operation of office and transportation equipment
9	• Translation, interpretation, publication, small video production, ads (hardcopy, videos, TV). All reports will be made available in national language and English. Trainings, workshops and conferences will include interpretation as appropriate to the stakeholders/recipients.
10	• Misc
11	• Organization/participation in meetings, workshops, stakeholder consultations for establishment of reliable, transparent MRV system for overall project and each site specific data
12	• Short-term local consultants to identify capacity needs for technology transfer
13	• Travel costs for in and out of country travel for international and national consultants
14	• Supporting initiatives, including coordination with planned and parallel activities led by UNDP
15	• Supporting initiatives, including coordination with planned and parallel activities led by UNDP related to knowledge management, information transfer
16	• International consultant for Localization of international best practice • International consultant for supporting the development of the exit strategy
17	• Long term local technical support for de-risking initiatives • Local consultant for supporting the development of the exit strategy
18	• Project manager to share expert task (40%) to provide expert backstopping on the legal/institutional enabling framework for the retrofit activities in public and residential buildings • Consultants for development of legal-regulatory package • Consultants for legal advice
19	• Travel costs for in and out of country travel for international and national consultants
20	• Local companies for development of legal-regulatory package

No.	Description of cost item
21	• Translation, interpretation, publication, small video production, ads (hardcopy, videos, TV). All reports will be made available in national language and English. Trainings, workshops and conferences will include interpretation as appropriate to the stakeholders/recipients.
22	• Organization/participation in meetings, workshops, stakeholder consultations
23	• International consultant for assisting the team with on-call advice • Support to public building EE retrofits • Assisting of implementation of public buildings' energy efficiency financing • International consultants to develop marketing platform
24	• Support for development of financial instruments for individual households • Development of business plans for project stakeholder HoAs • Development of verification and validation related activities • National consultants to work on implementation of public building energy efficiency financint • Local consultant to develop marketing platform
25	• Financial consultant to be hired under service contract modality • Local adviser on energy audit • Local adviser on EE finance • Project consultant on PR, outreach and marketing platform
26	• Travel costs for in and out of country travel for international and national consultants
27	• Local companies for development of marketing products • Local companies for development of de-risking schemes • Development of energy audits • Development of financial instruments • Local companies to support marketing platform implementation Note that this will include work by companies that are the intermediaries (ESCOs and HOAs) who will be prototyping financial de-risking instruments, and also the marketing and financial advisory companies who will be providing specialized support. These companies are not preselected, but will be selected via a competitive procurement process consistent with the specific needs of residential and public buildings, therefore we cannot provide a breakdown by each company. However, we can provide the breakdown by company type: de-risking for USD 1,000,000 and marketing and financial advisory USD 510,000.
28	• Translation, interpretation, publication etc. related costs. The preparation of financial documentation and review of international documentation will require translation. This will require specialized translators and interpreters, with higher specific costs. Further, the project will be producing manuals (which will include both translation and printing costs). Advertisements targeted at households or bank clients (individuals or ESCOs) will be prepared and launched, and short videos will be produced for running within participating local banks targeting their customers.
29	• Costs associated with organization/participation in meetings, workshops, stakeholder consultations
30	• Micro-capital grants to Home-owners Associations (HOAs) that have NGO status in Armenia, for retrofits totalling ~$150k per set of buildings overseen by different HOAs
31	• Contractual services providing implementation of incentive programme with ESCOs – public sector
	• Contractual services providing implementation of incentive programme with ESCOs – residential sector
32	• Project manager
33	• Travel costs for in and out of country travel for international and national consultants
34	• Communication costs -- internet, telephone
35	• Office IT equipment

No.	Description of cost item
36	• Direct project costs – support services. For full details see UNDP Project Document, Annex 2, Attachment 1 'Description of UNDP Country Office Support Services'
37	• Costs associated with organization/participation in meetings, workshops, stakeholder consultations. Training will be provided on project management, reporting and related learning costs (e.g. tax requirements, procurement rules). This will not be used for UNDP internal costs.
38	• International consultants hired to undertake the initial review, mid-term review and final evaluations
39	• Driver
40	• Office communication expenses
41	• Stationery and other office supplies
42	• Project financial audit
43	• Translation, interpretation, publication. All reports will be made available in national language and English. Meetings will include interpretation as appropriate to the stakeholders/recipients.
44	• Miscellaneous

B. Disbursement Plan

Disbursements	GCF Proceeds (million USD)
Disbursement 1	729,000
Disbursement 2	1,608,000
Disbursement 3	3,596,000
Disbursement 4	4,191,000
Disbursement 5	5,358,000
Disbursement 6	4,518,000
Total	**20,000,000**

GREEN CLIMATE FUND

Schedule 3. Implementation Arrangements

The Implementation Arrangements for the Funded Activity are included in the Funding Proposal attached herein as Annex 1.

Schedule 4. Reporting

A. Reporting Period

The Reporting Period for the Project shall be from the Effective Date to the Completion Date ("**Reporting Period**").

B. Project calendar/milestones

Milestones	Expected Timing
Start of Project Implementation	Effective Date
Inception Report (including assessment of baselines)	Within six (6) months after the Effective Date
Interim Independent Evaluation Report	Within three (3) months after Year three (3) from the Effective Date
Project Completion Report (Final APR)	Within three (3) months after the Completion Date
Final Independent Evaluation Report	Within six (6) months after the Completion Date

Schedule 5. Implementation Plan

	2017				2018				2019				2020				2021				2022				2023	
	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2
1. Output 1 Establishment of Building Sector MRV																										
Activity 1.1 *MRV systems for the buildings sector in Armenia established*																										
Sub-activity 1.1.1 Development of the MRV framework, including guidelines and monitoring methodologies for the various categories of buildings																										
Sub-activity 1.1.2 Support to full implementation of building EMIS in selected buildings for demonstration and capacity building purposes																										
Activity 1.2 *Knowledge management and MRV Information disseminated*																										
Sub-activity 1.2.1 Identify appropriate formats for reaching the relevant stakeholders																										
Sub-activity 1.2.2 Establish a website that will provide information and a platform for communication between the different stakeholders																										
Sub-activity 1.2.3 Information dissemination to maximize the impact potential of the project in Armenia and beyond																										
Sub-activity 1.2.4 Provision of information to consumers																										
2. Output 2. Policy De-Risking																										
Activity 2.1 *Public instruments for the promotion of investment in EE selected*																										
Sub-activity 2.1.1 Support to policy-makers in selecting public instruments using UNDP's de-risking framework to promote sustainable energy investment in developing countries																										
Activity 2.2 *Support provided to on-going legal reform in the field of energy efficiency*																										
Sub-activity 2.2.1 Support to national, sub-national and local authorities to adopt and implement an enabling policy framework for energy efficiency retrofits																										
Sub-activity 2.2.2 Support to the gradual introduction of binding legislation on energy auditing, energy passports/certificates and labelling for existing buildings																										
Sub-activity 2.2.3 Support to the introduction of legislation specific to public buildings' energy efficiency retrofits																										

	2017				2018				2019				2020				2021				2022				2023	
	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2
Activity 2.3 *Support provided for the creation of an enabling policy framework for energy efficiency retrofits in multi-owner residential buildings*																										
Sub-activity 2.3.1 Support to policy-makers in developing policy relating to HOA legal status, payment enforcement, professional management and consensus levels																										
Activity 2.4 *Support provided to building owners / managers / owner associations / ESCOs on legal matters related to energy efficiency retrofit projects*																										
Sub-activity 2.4.1 Provide support on legal matters related to energy efficiency retrofit projects for multi-owner buildings																										
Sub-activity 2.4.2 Provide support for establishing ESCOs																										
Activity 2.5 *Exit strategy measures implemented*																										
Sub-activity 2.5.1 Development and implementation of the exit strategy																										
3. Output 3 Financial De-Risking																										
Activity 3.1 *Technical assistance provided to banks and other financial institutions*																										
Sub-activity 3.1.1 Provide support to banks to develop and market products for energy efficiency in individual residences																										
Activity 3.2 *Technical assistance provided to banks for HOA market facilitation*																										
Sub-activity 3.2.1 Support to development of bank products for HOAs																										
Activity 3.3 *Technical assistance provided to local government to develop energy efficiency retrofit projects for publicly-owned buildings*																										
Sub-activity 3.3.1 Support to the process of identification, development and aggregation of technically- and financially-feasible energy efficiency retrofit projects in publicly-owned buildings																										
Activity 3.4 *Access to affordable capital for energy efficiency retrofits provided*																										
Sub-activity 3.4.1 Establishment and maintenance of the technical structure for the financial de-risking instruments offered																										
Sub-activity 3.4.2 Verification of funded investments																										
Activity 3.5 *Market platform created*																										

	2017				2018				2019				2020				2021				2022				2023	
	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2
Sub-activity 3.5.1 Provide marketing support to banks																										
4. Output 4 Financial Incentives																										
Activity 4.1 *Targeted financial incentives provided to vulnerable groups to help address the affordability gap*																										
Sub-activity 4.1.1 Targeted financial incentives provided to building / apartment owners, or the ESCOs serving these clients																										
Reporting dates as per FAA																										
Inception report (including baselines assessment)																										
First Annual Project Report (APR)																										
Interim Independent Evaluation Report																										
Project Completion Report (last APR)																										
Final Independent Evaluation Report																										

Indicates duration of the activity

Schedule 6. Request for Disbursement

[UNDP'S LETTERHEAD]

Green Climate Fund
175, Art Center-daero
Yeonsu-gu, Incheon 22004
Republic of Korea
Attn: [CFO]

[DATE]

Ref: Request for Disbursement – Funded Activity Agreement – Funded Activity: FP010 "De-risking and scaling up investment in energy efficient building retrofits" – Request for Disbursement [No. [____]]

Ladies and Gentlemen:

1. Reference is made to the Funded Activity Agreement dated as of [DATE] (the "Agreement") between the United Nations Development Programme (the "Recipient") and the Green Climate Fund ("GCF"). Capitalized terms used but not defined in this request have the meanings assigned to them in the Agreement. The rules of interpretation set forth in Clause 1 of the Agreement shall apply to this request.
2. The Recipient irrevocably requests disbursement on [DATE] (or as soon as practicable thereafter) of:
   (a) the amount of [_____] USD under the Agreement (the "Disbursement"), in accordance with Clause 3 of the Agreement, to be transferred to the GCF Account – Account No. _____, [SWIFT/ABA] at [name and address of bank] in [city/country]; and
   (b) the amount of [_____] USD as payment of the Accredited Entity Fee, in accordance with Clause 4 of the Agreement, to be transferred to the Account No. _____, [SWIFT/ABA] at [name and address of bank] in [city/country].
3. The Recipient certifies that all applicable conditions precedent set forth in Clause 8 of the Agreement have been satisfied.
4. The Recipient further certifies that the proceeds of all Disbursements shall be applied only for the purpose described in Clause 3 of the Agreement.
5. The above certifications are effective as of the date hereof and shall continue to be effective as of the date of disbursement for this Disbursement. If any certification is no longer valid as of or prior to such Disbursement, the Recipient will notify GCF immediately and, on demand, repay the Disbursement (or any portion thereof) if the Disbursement is made prior to GCF's receipt of such notice.
6. The Recipient acknowledges hereby that the total amount of funds disbursed:
   (a) as Grant under the Agreement up to the current date, without considering the funds to be disbursed under this request, is [_____] USD; and
   (b) as Accredited Entity Fee under the Agreement up to the current date, without considering the funds to be disbursed under this request, is [_____] USD.

Yours truly,
UNDP

By: _____
Authorized Representative

By: _____
Authorized Representative

Annex 2. Standard Letter of Agreement between UNDP and the Government for the Provision of Support Services

Excellency,

1. Reference is made to consultations between officials of the Government of *Armenia* (hereinafter referred to as "the Government") and officials of UNDP with respect to the provision of support services by the UNDP country office for nationally managed programmes and projects. UNDP and the Government hereby agree that the UNDP country office may provide such support services at the request of the Government through its institution designated in the relevant programme support document or project document, as described below.

2. The UNDP country office may provide support services for assistance with reporting requirements and direct payment. In providing such support services, the UNDP country office shall ensure that the capacity of the Government-designated institution is strengthened to enable it to carry out such activities directly. The costs incurred by the UNDP country office in providing such support services shall be recovered from the administrative budget of the office.

3. The UNDP country office may provide, at the request of the designated institution, the following support services for the activities of the programme/project:

(a) Identification and/or recruitment of project and programme personnel;

(b) Identification and facilitation of training activities;

(c) Procurement of goods and services;

4. The procurement of goods and services and the recruitment of project and programme personnel by the UNDP country office shall be in accordance with the UNDP regulations, rules, policies and procedures. Support services described in paragraph 3 above shall be detailed in an annex to the programme support document or project document, in the form provided in the Attachment hereto. If the requirements for support services by the country office change during the life of a programme or project, the annex to the programme support document or project document is revised with the mutual agreement of the UNDP resident representative and the designated institution, while ensuring the total approved direct project costs amount charged to the GCF funds is not exceeded.

5. The relevant provisions of the SBAA between the Authorities of the Government of Armenia 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. The Government shall retain overall responsibility for the nationally managed programme or project through its designated institution. The responsibility of the UNDP country office for the provision of the support services described herein shall be limited to the provision of such support services detailed in the annex to the programme support document or project document.

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

7. The manner and method of cost-recovery by the UNDP country office in providing the support services described in paragraph 3 above shall be specified in the annex to the programme support document or project document.

8. The UNDP country office shall submit progress reports on the support services provided and shall report on the costs reimbursed in providing such services, as may be required.

9. Any modification of the present arrangements shall be effected by mutual written agreement of the parties hereto.

10. If you are in agreement with the provisions set forth above, please sign and return to this office two signed copies of this letter. Upon your signature, this letter shall constitute an agreement between your Government and UNDP on the terms and conditions for the provision of support services by the UNDP country office for nationally managed programmes and projects.

For the Government
Artsvik Minasyan
Minister of Nature Protection of the Republic of Armenia

Signature: .....

Date: 07/02/2017

Signed on Behalf of UNDP
Bradley Busetto
UN Resident Coordinator
UNDP Resident Representative in Armenia

Signature: .....

Date: 07/02/2017

Attachment

Description of UNDP Country Office Support Services

1. Reference is made to consultations between the Ministry of Nature Protection, the institution designated by the Government of Armenia and officials of UNDP with respect to the provision of support services by the UNDP country office for the nationally managed "De-Risking and Scaling-up Investment in Energy Efficient Building Retrofits", Output ID Number 00101711.

2. In accordance with the provisions of the letter of agreement signed and the project document, the UNDP country office shall provide support services for the Project as described below.

3. Support services to be provided:

	Description of services	Reimbursement amount based on the Universal Price List 2017 used by UNDP for cost recovery with other UN Agencies (in USD)	UNIT	Number of Units	DPC per Service
1	Payment Process	34.48	Per voucher	3,100	106,888
2	Credit card payment	36.30	Per transaction	0	0
3	New vendor creation in ATLAS	18.04	Per vendor	100	1,804
4	Payroll validation	35.11	Per person, quarterly	250	8,777.5
5	Leave monitoring	5.02	Per person, quarterly	261	1,310
6	IC and SC recruitment, including	205.96	Per person	100	20,596
6a	Advertisement	41.19			
6b	Short listing	82.38			
6c	Contract Issuance	82.38			
7	Issue IDs	34.18	Per ID	10	342
8	F10 Settlement	28.29	Per item	478	13,523
9	Ticket request	27.80	Per ticket	80	2,224
10	Hotel reservation	12.50	Per booking	58	725
11	Visa request	22.80	Per person	20	456
12	Vehicle Registration	33.20	Per item	2	66
13	Procurement process involving local CAP or RACP/ACP	475.27	Per case	120	57,032
13a	Identification and selection	237.63			
13b	Contracting/Issue PO	118.82			
13c	Follow-up	118.82			
14	Procurement not involving review bodies	192.05	Per case	450	86,422.5
14a	Identification and selection	96.02			
14b	Contracting/Issue PO	48.01			
14c	Contract follow-up	48.01			
15	Disposal of equipment	241.68	Per lot	20	4,834
		Total: USD from GCF grant			305,000

Annex 3. Letter of agreement between the Accredited Entity, Implementing Partner and Responsible Parties

Provided seperately.

Annex 4. Letters of co-financing

1. European Investment Bank

Европейска инвестиционна банка
Evropská investiční banka
Den Europæiske Investeringsbank
Europäische Investitionsbank
Euroopa Investeerimispank
Ευρωπαϊκή Τράπεζα Επενδύσεων
European Investment Bank
Banco Europeo de Inversiones
Banque européenne d'investissement
An Banc Eorpach Infheistíochta
Europska investicijska banka
Banca europea per gli investimenti

Europas investīciju banka
Europos investicijų bankas
Európai Beruházási Bank
Bank Ewropew tal-Investiment
Europese Investeringsbank
Europejski Bank Inwestycyjny
Banco Europeu de Investimento
Banca Europeană de Investiții
Európska investičná banka
Evropska investicijska banka
Euroopan investointipankki
Europeiska investeringsbanken

Bradley Busetto
UN Resident Coordinator, UNDP Resident Representative
UN House
14, Petros Adamyan Street
Yerevan 0010 Armenia

Luxembourg, 16 July 2015

Ops/NC-2/2015-0124/VS/me

#65666

Subject: 2015-0124 Yerevan Energy Efficiency

EXP BEI-EIB
B 002977 17.JUL 15

Dear Bradley,

We would like to thank UNDP for the very good cooperation and preparation of the "De-Risking and Scaling-up Investment in Energy Efficient Building Retrofits" project proposal aiming at improving energy efficiency of municipal and multi-apartment buildings of Yerevan and reducing energy consumption in the city.

We are pleased to inform you that EIB is willing to support the project, the cost currently of which is estimated by UNDP at USD 115m. EIB support to energy efficiency projects would typically allow for financing up to 75% of the project cost, with the financing extended over long-term and at advantageous conditions.

On this basis, we inform you that the Bank has assigned a team to start the due diligence of the first phase of the project, with a cost of c.a. EUR 20m, which will focus on renovations of public buildings, and subject to a positive outcome, aims at submitting the financial proposal to the EIB's Board of Directors.

We understand that, upon request of the Armenian government, UNDP seeks to mobilise a **Green Climate Fund** grant to support the project. The value added of the grant is very high for both the municipal and multi-apartment components of the project.

For the municipal component, the grant will allow the project to be affordable to the Republic of Armenia. For the private sector (multi apartment) component of the project, the grant will enable the project to be affordable to the population, which due to perceptions of high investments risks and other market barriers, often refrains from doing energy efficiency investments based solely on commercial loan financing.

We are looking forward to continuing our cooperation.

UNDP ARMENIA
DATE 20.07.2015
INC. EEC059937

Sincerely Yours,

EUROPEAN INVESTMENT BANK

Philippe Szymczak
Head of Division
Public Sector East
Lending Operations in Neighbouring Countries

Violaine Silvestro
Loan Officer
Public Sector East
Lending Operations in Neighbouring Countries

98-100, boulevard Konrad Adenauer L-2950 Luxembourg +352 4379-1 +352 437704 info@eib.org www.eib.org

Европейска инвестиционна банка
Evropská investiční banka
Den Europæiske Investeringsbank
Europäische Investitionsbank
Euroopa Investeerimispank
Ευρωπαϊκή Τράπεζα Επενδύσεων
European Investment Bank
Banco Europeo de Inversiones
Banque européenne d'investissement
An Banc Eorpach Infheistíochta
Europska investicijska banka
Banca europea per gli investimenti
Eiropas Investīciju banka
Europos investicijų bankas
Európai Beruházási Bank
Bank Ewropew tal-Investiment
Europese Investeringsbank
Europejski Bank Inwestycyjny
Banco Europeu de Investimento
Banca Europeană de Investiții
Európska investičná banka
Evropska investicijska banka
Euroopan investointipankki
Europeiska investeringsbanken

Bradley Busetto
UN Resident Coordinator,
UNDP Resident Representative
UN House
14, Petros Adamyan Street
Yerevan 0010 Armenia

Luxembourg, 8 December 2015 Ops/NC-2 PUBEAST/EAST/20150124VS/me

Subject: MPSF Technical Assistance support for preparation of Yerevan Energy Efficiency Project (Building Rehabilitation).

Dear Bradley,

We would like to reiterate our thanks to UNDP for the very good cooperation and preparation of the "De-Risking and Scaling-up Investment in Energy Efficient Building Retrofits" project proposal aiming at improving energy efficiency of municipal and multi-apartment buildings of Yerevan and reducing energy consumption in the city.

This is to notify that EIB has mobilized a contribution of the Municipal Project Support Facility (MPSF) Technical Assistance in the amount of EUR 250,000 for preparation of the project. MPSF is a Technical Assistance Facility funded by the EU Neighborhood Investment Facility that has been recently launched by the European Commission in cooperation with several European Financial Institutions.

Technical assistance will consist of 5 stages.

- In the first stage, energy audits of several representative buildings will be carried out to validate the data collected already and set a baseline for establishing project objectives.
- In the second stage, project objectives will be set (investment costs, minimum energy performance requirements, required scope of works, payback anticipated) and expected results estimated (energy savings, GHG savings, financial savings).
- Next, the list of buildings will be revised to select buildings to be renovated under the project in line with established priorities (such as energy consumption level, location, size or technical condition of a building).
- In the fourth stage, the project implementation strategy will be developed and described in the Project Implementation Manual.
- In the final stage, the service provider will help the Municipality to design a sound Project Management Unit with designing workflows, allocating tasks to existing staff, as well as estimating the external support required and related costs.

The work of Technical Assistance team is expected to be completed in June 2016 and implementation of the Yerevan Building Rehabilitation Project to start in Q3 2016.

98-100, boulevard Konrad Adenauer L-2950 Luxembourg t. +352 4379-1 f. +352 437704 e. info@eib.org www.eib.org

Herein we kindly request you to let us know the name of the staff of UNDP that is expected to work closely with our Technical Assistance team, to ensure a good coordination between all contributions that will support this project, including the activities under the afore-mentioned Green Climate Fund proposal submitted by UNDP Armenia CO.

We are looking forward to continuing our cooperation.

Sincerely Yours,

EUROPEAN INVESTMENT BANK

p.p.

Lionel Rapaille
Head of Division
Public Sector East
Lending Operations in Neighbouring Countries

Violaine Silvestro
Senior Loan Officer
Public Sector East
Lending Operations in Neighbouring Countries

2. UNDP

United Nations Development Programme

Empowered lives.
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10 July 2015
L198/2015

Dear Ms. Cheikhrouhou,

Subject: **Co-financing commitment for "De-Risking and Scaling-up Investment in Energy Efficient Building Retrofits in Armenia" Project**

Herewith, I have the pleasure to confirm that UNDP in Armenia is ready to contribute USD 70,000 per year for the implementation of "De-Risking and Scaling-up Investment in Energy Efficient Building Retrofits in Armenia" Project for the whole Project duration from 2016 to 2021.

Taking the opportunity, I would like to thank the Green Climate Fund for cooperation.

Sincerely,

Bradley Busetto
UN Resident Coordinator/
UNDP Resident Representative in Armenia

Ms. Héla Cheikhrouhou
Executive Director
Green Climate Fund

UNDP, 14 Adamyan Str, Yerevan, Armenia, Tel: (37410) 566073, Fax: (37410) 543811
Web Site: http://www.am.undp.org, E-mail: registry.am@undp.org

Annex 5. Social and environmental screening procedure and management plan

Social and Environmental Screening

Project Information

Project Information	
1. Project Title	De-risking and Scaling-up Investment in Energy Efficient Building Retrofits
2. Project Number	5684
3. Location (Global/Region/Country)	Armenia

Part A. Integrating Overarching Principles to Strengthen Social and Environmental Sustainability

QUESTION 1: How Does the Project Integrate the Overarching Principles in order to Strengthen Social and Environmental Sustainability?
Briefly describe in the space below how the Project mainstreams the human-rights based approach
Consultations have been undertaken during project identification to determine the stakeholders and their roles during project implementation. These consultations will continue throughout the project cycle. Stakeholders include the Government, the private sector, international organisations and multilateral development bodies, and other organisations such as the Builders' Union of Armenia and the Architects' Union of Armenia. These stakeholders have been and will continue to be consulted with regard to various components of the project, such as establishment of building sector MRV, developing policies for EE retrofits, updating and strengthening of energy performance standards and enforcement, identifying and developing a set of affordable EE retrofit opportunities, creating awareness and building capacity of commercial banks to perform due diligence and financial assessment of EE retrofit projects, and selection criteria for EE retrofit financing. A mechanism to deal with grievances and other potential conflict issues will be set up consistent with the Social and Environmental Standards of UNDP (2015) and the Interim Environmental and Social Safeguards of the GCF (Annex III, GCF/B.07/11).
Briefly describe in the space below how the Project is likely to improve gender equality and women's empowerment
The project will involve gender mainstreaming opportunities in the establishment of MRV, where users will be trained on data collection and analysis, and the use of Energy Management Information Systems (EMIS); training and awareness-raising for commercial banks on performing due diligence of EE retrofit opportunities; development of a national credit information system, and development of energy performance standards and a mechanism for continuous update and systematic enforcement. The project will involve an in-country gender expert in developing gender-disaggregated data and indicators to ensure equitable gender representation.
Briefly describe in the space below how the Project mainstreams environmental sustainability
Mainstreaming environmental sustainability in the project involves the following: (i) establishment of a measurement, reporting and verification system to be used in conjunction with an Energy Management Information System to promote energy efficiency investment in the building sector; (ii) development of policies on energy efficient building retrofits, updating and strengthening the energy performance standards of new and retrofitted buildings, and enforcement; (iii) building capacity of energy service companies (ESCOs) and building owners in identifying and developing affordable energy efficient retrofit investments, and creating awareness and training domestic commercial banks on due diligence of EE retrofit opportunities; and (iv) creating financial incentives to building owners and ESCOs to promote EE building retrofits. The overall outcome of these interventions will be a reduction in energy consumption with associated direct reductions in GHG emissions of 1.1 tCO_2 over a 20-year lifetime of the retrofitted buildings.

Part B. Identifying and Managing Social and Environmental Risks

QUESTION 2: What are the Potential Social and Environmental Risks?[70]	QUESTION 3: What is the level of significance of the potential social and environmental risks?[71]			QUESTION 6: What social and environmental assessment and management measures have been conducted and/or are required to address potential risks (for Risks with Moderate and High Significance)?
Risk Description	***Impact and Probability (1-5)***	***Significance (Low, Moderate, High)***	***Comments***	***Description of assessment and management measures as reflected in the Project design. If ESIA or SESA is required note that the assessment should consider all potential impacts and risks.***
Risk 1: The project may discriminate against women in relation to access to opportunities and benefits	I = 3 P = 1	**Low**	Armenian society is still strongly influenced by traditional gender roles and norms that designate mainly women responsible for maintaining the home and childcare. Studies on the use of time reveal that women spend five times more time on housework or other unpaid work than men. Women are not regarded as decision-makers in the public sphere, and such traditional views lead women to accept discrimination as a "normal" part of life (Gender Assessment, USAID Armenia, August 2010).	• The project will analyse any gender-based differences in access to financing and capacity building activities, and will involve an in-country gender expert in developing gender-disaggregated data and indicators and ensure an equitable gender representation in the selection process for financing, focus group discussions and training. • Capacity building opportunities incorporated in the project that will ensure female participation include: establishment of building MRV where users will be trained on data collection and analysis, and the use of EMIS; training and awareness-raising for commercial banks on performing due diligence of EE retrofit opportunities; development of a national credit information system, development of energy performance standards and a mechanism for continuous update and systematic enforcement.
Risk 2: Retrofit works and failure of structural elements from building retrofits may pose safety risks to communities	I = 3 P = 1	**Low**	Workers may not have the right experience and training on proper dismantling of building parts during retrofits. Asbestos was not used in	• Only legally registered contractor(s) will be allowed to undertake EE building retrofits. Proof of experience and track record will be required from the contractor(s) prior to award of the retrofit work.

[70] Note: Describe briefly potential social and environmental risks identified in Attachment 1 – Risk Screening Checklist (based on any "Yes" responses). If no risks have been identified in Attachment 1 then note "No Risks Identified" and skip to Question 4 and Select "Low Risk". Questions 5 and 6 not required for Low Risk Projects

[71] Note: Respond to Questions 4 and 5 below before proceeding to Question 6

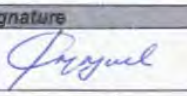
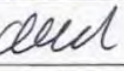
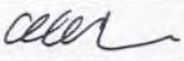
QUESTION 2: What are the Potential Social and Environmental Risks?[70]	QUESTION 3: What is the level of significance of the potential social and environmental risks?[71]			QUESTION 6: What social and environmental assessment and management measures have been conducted and/or are required to address potential risks (for Risks with Moderate and High Significance)?
Risk Description	***Impact and Probability (1-5)***	***Significance (Low, Moderate, High)***	***Comments***	***Description of assessment and management measures as reflected in the Project design. If ESIA or SESA is required note that the assessment should consider all potential impacts and risks.***
			Armenia in buildings so this is not an issue.	• Contractor(s) will be required to conduct orientation and training for workers on EE building retrofits, particularly multi-family apartment buildings and public buildings.
Risk 3: Duty-bearers do not have the capacity to meet their obligations, such as in collecting baseline data for the EMIS and in managing EE building retrofit financing projects	I = 3 P = 1	**Low**	Lack of institutional and technical capability to address issues relating to energy efficient building retrofits, identifying and setting priorities for retrofits, managing projects on energy efficient building retrofits, maintaining energy databases, and enforcement of energy standards.	• Component 1 will include capacity building on establishing MRV, data collection and analysis, and procurement/installation of EMIS. • Component 2 will support broader legislative reforms to develop building codes, energy auditing, energy certification and labelling for existing buildings, multi-owner building management, payment enforcement, and the framework for energy efficiency retrofits.
Risk 4: Potential for excluding affected stakeholders from participation	I = 2 P = 1	**Low**	Inadequate and/or lack of consultation may exclude stakeholders such as women's committees, citizens' organisations and female-headed households (women head almost one-third of Armenian households – Gender Assessment USAID Armenia, August 2010) in providing inputs on issues such as the establishment of energy performance standards for retrofitted buildings, policy dialogues on illegal buildings, retrofit financing, and enforcement of standards.	Consultations have been undertaken during project identification to determine the project stakeholders and their roles during project implementation. These consultations will continue throughout the project cycle. Consultations on various components of the project will be designed to be gender-sensitive, inclusive and responsive to the needs of the stakeholders identified. A mechanism to deal with potential conflict issues during implementation has been incorporated in the project design.

QUESTION 2: What are the Potential Social and Environmental Risks?[70]	QUESTION 3: What is the level of significance of the potential social and environmental risks?[71]			QUESTION 6: What social and environmental assessment and management measures have been conducted and/or are required to address potential risks (for Risks with Moderate and High Significance)?
Risk Description	***Impact and Probability (1-5)***	***Significance (Low, Moderate, High)***	***Comments***	***Description of assessment and management measures as reflected in the Project design. If ESIA or SESA is required note that the assessment should consider all potential impacts and risks.***
Risk 5: Vulnerability to climate change	I = 2 P = 1	**Low**	An increase in temperature will reduce demand for heating but will also increase demand for cooling. Since cooling is usually electrical and electricity is more costly than natural gas, this may increase demand for retrofits.	• The 1961-1990 average winter temperature was -5.3°C. Even with a rapid increase in temperature due to climate change, this is unlikely to significantly reduce the demand for heating. • Data from the MRV component will provide insight into the impacts of warmer weather. This will be valuable for future activities but overall impacts on borrowing are beyond the scope of this project.
Risk 4: Generation of waste from building retrofits	I = 3 P = 1	**Low**	Tearing down insulation and replacing pipes, doors and windows as part of retrofit works will generate waste.	Recipients of financing for EE building retrofits will be required to dispose of the waste generated from civil works following the applicable regulations. Management of waste / construction debris will be part of the conditions in granting the funds and for awarding the civil works to the contractor. According to the Laws of the Republic of Armenia on Waste Disposal and Sanitary Purification, on Local Self-Government, Self-Government in Yerevan City and the Law on Waste, the arrangement of waste disposal is part of the local govenment mandatory responsibilities.

QUESTION 4: What is the overall Project risk categorization?		
Select one (see SESP for guidance)		**Comments**
Low Risk	**X**	Eliminating policy, financial, market and technical barriers, and creating an enabling environment for investments in energy efficiency building retrofits, include activities that have no risks of adverse social or environmental impacts. However, actual building retrofits may cause impacts such as the generation of waste, potential discrimination of women to access financing, etc. that are limited in scale and temporary.
Moderate Risk	☐	
High Risk	☐	

QUESTION 5: Based on the identified risks and risk categorization, what requirements of the SES are relevant?		
Check all that apply		**Comments**
Principle 1: Human Rights	**x**	Executing Agency may not have the capacity to meet human rights obligations to the project
Principle 2: Gender Equality and Women's Empowerment	**x**	Potential to discriminate women in consultations and in access to project benefits and opportunities
1. Biodiversity Conservation and Natural Resource Management	☐	
2. Climate Change Mitigation and Adaptation	☐	
3. Community Health, Safety and Working Conditions	**x**	Structural failure posing safety risks due to lack of workers' training on EE building retrofits
4. Cultural Heritage	☐	
5. Displacement and Resettlement	☐	
6. Indigenous Peoples	☐	
7. Pollution Prevention and Resource Efficiency	**x**	Generation of waste from building retrofit works

Final Sign Off

Signature	*Date*	*Description*
	24.07.2015	QA Assessor Armen Martirosyan, Environmental Governance portfolio analyst, UNDP Armenia CO
	24.07.2015	QA Approver Claire Medina, UNDP Deputy Resident Representative, UNDP Armenia CO
	24.07.2015	PAC Chair Claire Medina, UNDP Deputy Resident Representative, UNDP Armenia CO

SESP Attachment 1. Social and Environmental Risk Screening Checklist

Principles 1: Human Rights		**Answer (Yes/No)**
1.	Could the Project lead to adverse impacts on enjoyment of the human rights (civil, political, economic, social or cultural) of the affected population and particularly of marginalised groups?	No
2.	Is there a likelihood that the Project would have inequitable or discriminatory adverse impacts on affected populations, particularly people living in poverty or marginalised or excluded individuals or groups? [72]	No
3.	Could the Project potentially restrict availability, quality of and access to resources or basic services, in particular to marginalised individuals or groups?	No
4.	Is there a likelihood that the Project would exclude any potentially affected stakeholders, in particular marginalised groups, from fully participating in decisions that may affect them?	Yes
5.	Are there measures or mechanisms in place to respond to local community grievances?	Yes*
6.	Is there a risk that duty-bearers do not have the capacity to meet their obligations in the Project?	Yes
7.	Is there a risk that rights-holders do not have the capacity to claim their rights?	No
8.	Have local communities or individuals, given the opportunity, raised human rights concerns regarding the Project during the stakeholder engagement process?	No
9.	Is there a risk that the Project would exacerbate conflicts among and/or the risk of violence to project-affected communities and individuals?	No
Principle 2: Gender Equality and Women's Empowerment		
1.	Is there a likelihood that the proposed Project would have adverse impacts on gender equality and/or the situation of women and girls?	No
2.	Would the Project potentially reproduce discriminations against women based on gender, especially regarding participation in design and implementation or access to opportunities and benefits?	Yes
3.	Have women's groups/leaders raised gender equality concerns regarding the Project during the stakeholder engagement process and has this been included in the overall Project proposal and in the risk assessment?	No
3.	Would the Project potentially limit women's ability to use, develop and protect natural resources, taking into account different roles and positions of women and men in accessing environmental goods and services? *For example, activities that could lead to natural resources degradation or depletion in communities who depend on these resources for their livelihoods and well being*	No

Principle 3: Environmental Sustainability: Screening questions regarding environmental risks are encompassed by the specific Standard-related questions below		
Standard 1: Biodiversity Conservation and Sustainable Natural Resource Management		
1.1	Would the Project potentially cause adverse impacts to habitats (e.g. modified, natural, and critical habitats) and/or ecosystems and ecosystem services? *For example, through habitat loss, conversion or degradation, fragmentation, hydrological changes*	No
1.2	Are any Project activities proposed within or adjacent to critical habitats and/or environmentally sensitive areas, including legally protected areas (e.g. nature reserve, national park), areas	No

[72] Prohibited grounds of discrimination include race, ethnicity, gender, age, language, disability, sexual orientation, religion, political or other opinion, national or social or geographical origin, property, birth or other status including as an indigenous person or as a member of a minority. References to "women and men" or similar is understood to include women and men, boys and girls, and other groups discriminated against based on their gender identities, such as transgender people and transsexuals.

* UNDP Social and Environmental Standards effective on 1 January 2015 provide guidance on setting-up a project-level grievance redress mechanism (see Stakeholder Engagement and Response Mechanisms, paragraphs 12-20, and Monitoring, Reporting and Compliance, paragraphs 22-27.)

	proposed for protection, or recognised as such by authoritative sources and/or indigenous peoples or local communities?	
1.3	Does the Project involve changes to the use of lands and resources that may have adverse impacts on habitats, ecosystems, and/or livelihoods? (Note: if restrictions and/or limitations of access to lands would apply, refer to Standard 5)	No
1.4	Would Project activities pose risks to endangered species?	No
1.5	Would the Project pose a risk of introducing invasive alien species?	No
1.6	Does the Project involve harvesting of natural forests, plantation development, or reforestation?	No
1.7	Does the Project involve the production and/or harvesting of fish populations or other aquatic species?	No
1.8	Does the Project involve significant extraction, diversion or containment of surface or ground water? *For example, construction of dams, reservoirs, river basin developments, groundwater extraction*	No
1.9	Does the Project involve utilisation of genetic resources? (e.g. collection and/or harvesting, commercial development)	No
1.10	Would the Project generate potential adverse transboundary or global environmental concerns?	No
1.11	Would the Project result in secondary or consequential development activities which could lead to adverse social and environmental effects, or would it generate cumulative impacts with other known existing or planned activities in the area? *For example, a new road through forested lands will generate direct environmental and social impacts (e.g. felling of trees, earthworks, potential relocation of inhabitants). The new road may also facilitate encroachment on lands by illegal settlers or generate unplanned commercial development along the route, potentially in sensitive areas. These are indirect, secondary, or induced impacts that need to be considered. Also, if similar developments in the same forested area are planned, then cumulative impacts of multiple activities (even if not part of the same Project) need to be considered.*	No
Standard 2: Climate Change Mitigation and Adaptation		
2.1	Will the proposed Project result in significant[73] greenhouse gas emissions or may exacerbate climate change?	No
2.2	Would the potential outcomes of the Project be sensitive or vulnerable to potential impacts of climate change?	No
2.3	Is the proposed Project likely to directly or indirectly increase social and environmental vulnerability to climate change now or in the future (also known as maladaptive practices)? *For example, changes to land use planning may encourage further development of floodplains, potentially increasing the population's vulnerability to climate change, specifically flooding*	No
Standard 3: Community Health, Safety and Working Conditions		
3.1	Would elements of Project construction, operation, or decommissioning pose potential safety risks to local communities?	Yes
3.2	Would the Project pose potential risks to community health and safety due to the transport, storage, and use and/or disposal of hazardous or dangerous materials (e.g. explosives, fuel and other chemicals during construction and operation)?	No
3.3	Does the Project involve large-scale infrastructure development (e.g. dams, roads, buildings)?	No
3.4	Would failure of structural elements of the Project pose risks to communities? (e.g. collapse of buildings or infrastructure)	Yes
3.5	Would the proposed Project be susceptible to or lead to increased vulnerability to earthquakes, subsidence, landslides, erosion, flooding or extreme climatic conditions?	No

[73] In regards to CO_2, 'significant emissions' corresponds generally to more than 25,000 tons per year (from both direct and indirect sources). [The Guidance Note on Climate Change Mitigation and Adaptation provides additional information on GHG emissions.]

3.6	Would the Project result in potential increased health risks (e.g. from water-borne or other vector-borne diseases or communicable infections such as HIV/AIDS)?	No
3.7	Does the Project pose potential risks and vulnerabilities related to occupational health and safety due to physical, chemical, biological, and radiological hazards during Project construction, operation, or decommissioning?	No
3.8	Does the Project involve support for employment or livelihoods that may fail to comply with national and international labour standards (i.e. principles and standards of ILO fundamental conventions)?	No
3.9	Does the Project engage security personnel that may pose a potential risk to health and safety of communities and/or individuals (e.g. due to a lack of adequate training or accountability)?	No
Standard 4: Cultural Heritage		
4.1	Will the proposed Project result in interventions that would potentially adversely impact sites, structures, or objects with historical, cultural, artistic, traditional or religious values or intangible forms of culture (e.g. knowledge, innovations, practices)? (Note: Projects intended to protect and conserve Cultural Heritage may also have inadvertent adverse impacts)	No
4.2	Does the Project propose utilising tangible and/or intangible forms of cultural heritage for commercial or other purposes?	No
Standard 5: Displacement and Resettlement		
5.1	Would the Project potentially involve temporary or permanent and full or partial physical displacement?	No
5.2	Would the Project possibly result in economic displacement (e.g. loss of assets or access to resources due to land acquisition or access restrictions – even in the absence of physical relocation)?	No
5.3	Is there a risk that the Project would lead to forced evictions?[74]	No
5.4	Would the proposed Project possibly affect land tenure arrangements and/or community-based property rights/customary rights to land, territories and/or resources?	No
Standard 6: Indigenous Peoples		
6.1	Are indigenous peoples present in the Project area (including Project area of influence)?	No
6.2	Is it likely that the Project or portions of the Project will be located on lands and territories claimed by indigenous peoples?	No
6.3	Would the proposed Project potentially affect the rights, lands and territories of indigenous peoples (regardless of whether Indigenous Peoples possess the legal titles to such areas)?	No
6.4	Has there been an absence of culturally appropriate consultations carried out with the objective of achieving FPIC on matters that may affect the rights and interests, lands, resources, territories and traditional livelihoods of the indigenous peoples concerned?	No
6.4	Does the proposed Project involve the utilisation and/or commercial development of natural resources on lands and territories claimed by indigenous peoples?	No
6.5	Is there a potential for forced eviction or the whole or partial physical or economic displacement of indigenous peoples, including through access restrictions to lands, territories, and resources?	No
6.6	Would the Project adversely affect the development priorities of indigenous peoples as defined by them?	No
6.7	Would the Project potentially affect the traditional livelihoods, physical and cultural survival of indigenous peoples?	No
6.8	Would the Project potentially affect the Cultural Heritage of indigenous peoples, including through the commercialisation or use of their traditional knowledge and practices?	No

[74] Forced evictions include acts and/or omissions involving the coerced or involuntary displacement of individuals, groups, or communities from homes and/or lands and common property resources that were occupied or depended upon, thus eliminating the ability of an individual, group, or community to reside or work in a particular dwelling, residence, or location without the provision of, and access to, appropriate forms of legal or other protections.

Standard 7: Pollution Prevention and Resource Efficiency		
7.1	Would the Project potentially result in the release of pollutants to the environment due to routine or non-routine circumstances with the potential for adverse local, regional, and/or transboundary impacts?	No
7.2	Would the proposed Project potentially result in the generation of waste (both hazardous and non-hazardous)?	Yes
7.3	Will the proposed Project potentially involve the manufacture, trade, release, and/or use of hazardous chemicals and/or materials? Does the Project propose use of chemicals or materials subject to international bans or phase-outs? *For example, DDT, PCBs and other chemicals listed in international conventions such as the Stockholm Conventions on Persistent Organic Pollutants or the Montreal Protocol*	No
7.4	Will the proposed Project involve the application of pesticides that may have a negative effect on the environment or human health?	No
7.5	Does the Project include activities that require significant consumption of raw materials, energy, and/or water?	No

Annex 6. Gender analysis and action plan

I. Introduction

This assessment aims to provide an overview of the gender situation in Armenia, identify gender issues that may be relevant to the project, and to examine potential gender mainstreaming opportunities. The assessment was based on available data from studies conducted by the Government of Armenia, donor agencies, and multilateral development banks.

II. Energy Efficiency in the Building Sector

Armenia is highly dependent on energy imports mostly from Iran and the Russian Federation to sustain its energy needs as they have no proven reserves of oil or natural gas.[75] Its dependency on energy imports is aggravated by the poor use of energy resources, and aging power generation plants. To address the core of this energy challenge, the government approved in 2007 the National Program on Energy Saving and Renewable Energy (NPESRE) which highlights the critical importance of renewable energy and identifies a broad range of energy-saving measures to be undertaken by various economic sectors including the building sector.[76]

The unsustainable energy use in buildings intensifies development, security and climate-related challenges:[77]

- About 30% of households in Armenia are energy-poor, where energy poverty (often called 'fuel poverty') is defined as households spending more than 10% of their budgets on energy.
- 45% of apartments in multi-family buildings have indoor temperatures in winter below 19°C (i.e. below established international standards for human occupancy).[78]
- 50% of energy use in buildings depends on imported fossil fuels.
- 24% of CO_2 emissions come from energy use in buildings.
- Over 50% of energy can be saved via energy efficient retrofits.

According to the NPESRE, with proper thermal insulation of residential and municipal buildings, a reduction in energy consumption of up to 30% can be achieved or an annual energy saving potential of about 4.02 million Gcal.

II. Existing Gender Inequality

In 2014, the population in Armenia reached 3 million and women accounts for more than half of the total population (52.78%). Female-headed households represent 37.1% in 2010.[79] Literacy rate of women ages 15 years old and higher is the same as men (about 99.7% in 2011). More girls attend secondary school than boys (100:119).[80]

Even with high literacy rate, Armenia is still strongly influenced by traditional gender roles and norms that designate women responsible for maintaining the home and childcare. Studies on usage of time reveal that women spent five times more time on housework or other unpaid work than men. Women are not regarded as decision-makers in the public sphere that such traditional views lead women to accept discrimination as a "normal" part of life.[81] The notion that men are usually breadwinners seems to influence decisions around hiring and promotion, but it is not reflective of the fact that women head almost a third of Armenian households.

[75] Asian Development Bank. Country Partnership Strategy, Armenia 2014-2018. December 2014. http://www.adb.org/sites/default/files/institutional-document/153661/cps-arm-2014-2018.pdf.

[76] USAID. National Program on Energy Saving and Renewable Energy of Republic of Armenia. 2007. http://www.ase.org/sites/ase.org/files/national_program_english.pdf

[77] GCF Funding Proposal, 15 September 2015.

[78] US Department of Labor. https://www.osha.gov/pls/oshaweb/owadisp.show_document?p_table=FAQ&p_id=118

[79] World Bank. Gender Equality Data and Statistics. Armenia. http://datatopics.worldbank.org/gender/country/armenia.

[80] UNESCAP. Statistical Yearbook for Asia and the Pacific 2014. p.10. http://www.unescap.org/sites/default/files/ESCAP-SYB2014_0.pdf, Statistical Yearbook for Asia.

[81] USAID. Gender Assessment USAID/Armenia. 2010. http://pdf.usaid.gov/pdf_docs/Pdacr978.pdf

The seats held by women in national parliaments represent only 10.7% (2014). Out of the 18 ministries in 2013, only seven ministries have women minister/deputy minister and in the Ministry of Energy and Natural Resources, there was no woman as head since 2010.[82] In the Constitutional Court, there is only one woman member since 2010.

Women borrow more compared to men for reasons such as home construction, health, emergencies, school fees, weddings, and funerals. Women borrow more for health and medical purposes (18%) than men (9%). Sources of borrowing are financial institutions, private informal lender, family or friends. There is no gender inequality on access to these sources but men are more likely to come up with emergency funds (25%) compared to women (17.5%).

Employment is male-dominated in industry (73.8%), construction (96.4%), transportation, information and communication (82.8%); and financial, real estate, professional, scientific, technical, administrative and support activity (56.5%). This suggests that women may not have equal benefits with men from job creation and employment opportunities in these sectors. Women employment is in public administration, education, human health, and social work (62%), agriculture (58%); and trade, repair, accommodation and food services activities.[83] Given this distribution in employment opportunities, female share of graduates are in education (83%), health (77%), humanities and art (66%); and social science, business and law (57%). Female unemployment rate as percentage of labour force is higher (21%) compared to male unemployment rate (17%).

Violence against women, mostly referring to domestic violence, is considered a serious problem in Armenia.[84] This is a form of gender-based violence (GBV) and there is no legislation that specifically addresses this issue. In 2013, crimes on serious physical injuries are committed by men and there were no convictions.[85] Armenia has not signed or ratified the Council of Europe Convention on preventing and combating violence against women and domestic violence which came into force on 1 August 2014.[86]

Through the years, there were several indices developed to quantify the concept of gender inequality. The United Nations Development Programme (UNDP) uses Gender Inequality Index (GII) and Gender Development Index (GDI).[87] GII is a composite measure that shows inequality in achievement between women and men in reproductive health, empowerment and the labour market while GDI measures achievement in human development in three areas: health, education, and command over economic resources. The GDI considers the gender gaps on human development between men and women.

Armenia has a GII of 0.325 (2013) and ranks 60th out of 148 countries suggesting that about 32.5% was the combined loss due to gender inequalities on achievement to reproductive health, empowerment and labour market participation. The GDI value (2013) is 0.994 indicating that the gender gap in human development in areas of health, education, and command over economic resources (represented by estimated earned income) is very minimal (less than 1%). The world average GDI value is 0.92.

The Global Gender Gap Index (GGGI) of the World Economic Forum examines the gap between men and women in four categories: economic participation and opportunity, educational attainment, health and survival; and political empowerment.[88] Out of 142 countries, Armenia's rank based on GGGI in 2014 is given below:

[82] National Statistical Service of Republic of Armenia. Women and Men in Armenia 2014. http://www.armstat.am/file/article/gender__09.10.2014.pdf.

[83] Ibid., p.118.

[84] USAID. Gender Assessment USAID/Armenia. 2010. http://pdf.usaid.gov/pdf_docs/Pdacr978.pdf.

[85] National Statistical Service of Republic of Armenia. Women and Men in Armenia 2014. http://www.armstat.am/file/article/gender__09.10.2014.pdf.

[86] Council of Europe. Chart of signatures and ratifications of Treaty 210. http://www.coe.int/en/web/conventions/full-list/-/conventions/treaty/210/signatures?p_auth=XNywEMSD

[87] United Nations Development Programme. Human Development Reports. http://hdr.undp.org/en/content/table-4-gender-inequality-index.

[88] World Economic Forum. The Global Gender Gap Report 2014. Country Profiles. http://www3.weforum.org/docs/GGGR14/GGGR_CountryProfiles.pdf.

Description	Score	Rank
Economic participation and opportunity	0.648	82
Educational attainment	1.0	31
Health and survival	0.933	142
Political empowerment	0.068	123
GGGI Source: The Global Gender Gap Report 2014	0.662 Inequality = 0.00 Equality = 1.00	103

Results indicate high gender inequality in political empowerment. The overall GGGI trend in Armenia from 2006 to 2014 shows minimal improvement.

The Organization for Economic Cooperation and Development (OECD) developed the Social Institutions and Gender Index (SIGI), a composite index that scores countries (i.e., 0 to 1) on 14 indicators grouped into five sub-indices: discriminatory family code, restricted physical integrity, son bias, restricted resources and assets, and restricted civil liberties to measure the discrimination against women in social institutions across 160 countries. The 2014 SIGI value for Armenia is 0.236 suggesting that discrimination against women is high.[89]

III. Legal and Administrative Framework Protecting Women and Promoting Gender Equality

Article 14.1 of the Constitution (1995) provides for the equality of men and women before the law and prohibits discrimination on the basis of sex.[90] The 2003 Criminal Code (Article 143) also prohibits gender discrimination.[91] The Labour Code, adopted on 9 November 2004 sets forth gender equality on remuneration (equal pay for equal work) and considers gender discrimination and sexual harassment in the workplace as gross violation of labour discipline.[92] The Labour Code allows pregnant women full wages while on maternity leave from 140 days and up to 180 days in the event of twins. Pregnant women and women caring for children below one year old are guaranteed workplace protection from dismissal, placement in equivalent position upon return from maternity leave, and rights to a flexible schedule. It is prohibited to employ or put these types of women in hazardous conditions.

On 13 September 1993, Armenia ratified the 1981 UN Convention on the Elimination of All forms of Discrimination against Women (CEDAW) and the 2000 Optional Protocol on violence against women on 14 September 2006.[93] Armenia is a member of the Council of Europe and has signed the 1950 European Convention on Human Rights on 25 January 2001 and ratified the same on 26 April 2002.[94]

In June 2013, the Law on Equal Rights and Equal Opportunities for Men and Women went into force. This law defines the concepts and terms related to gender equality, sexual harassment, concrete forms of direct and indirect discrimination; development and implementation of national gender equality policy and programmes, and its evaluation and monitoring through the collection of statistics. The adoption of the law was met with oppositions specifically on the use of "gender" defined by the law as an "acquired, socially fixed behavior of persons of different sexes."[95] Protests from the opponents of the law were launched demanding to remove the definition of gender but no amendments were made and in November 2013, the Council on Women's Affairs (CWA) under the Office of the Prime Minister, called for its full implementation and condemned harassment of women's NGOs right after the law was adopted.

[89] OECD. Social Institutions and Gender Index 2014. Country Profiles. http://genderindex.org/country/armenia.

[90] National Assembly of the Republic of Armenia. The Constitution of the Republic of Armenia (with amendments). 1995. http://www.parliament.am/parliament.php?id=constitution&lang=eng.

[91] Criminal Code of the Republic of Armenia. http://www.parliament.am/legislation.php?sel=show&ID=1349&lang=eng#7.

[92] ILO. National Labour Law Profile: Republic of Armenia. http://www.ilo.org/ifpdial/information-resources/national-labour-law-profiles/WCMS_158891/lang--en/index.htm.

[93] UN Treaty Collection. https://treaties.un.org/Pages/ViewDetails.aspx?src=TREATY&mtdsg_no=IV-8&chapter=4&lang=en and UN Women. http://www.un.org/womenwatch/daw/cedaw/states.htm.

[94] Council of Europe. Chart of signatures and ratifications of Treaty 005. http://www.coe.int/en/web/conventions/full-list/-/conventions/treaty/005/signatures?p_auth=s9uNDfa4.

[95] ADB. Armenia Country Gender Assessment. 2014. http://www.adb.org/documents/armenia-country-gender-assessment.

CWA is an interagency consultative body created in 2000 and re-organized in 2009 to enhance the status of women and to provide equal opportunities for men and women. CWA coordinates the implementation of strategic and short-term programs on gender equality, sex-based discrimination and issues on GBV. On 19 November 2014, Council on Men and Women Equality Affairs was established under Prime Minister's Decree N 1152-A as a national mechanism for coordinating and ensuring equal rights and opportunities for men and women in all aspects of public life.[96]

The Gender Policy Concept Paper approved on 18 February 2010 describes the directions and strategies of a national policy on gender equality. On 20 May 2011, the Gender Policy Strategic Action Plan for 2011-2015 was approved outlining the implementation strategies in six critical areas identified in the Gender Policy: power and decision-making, socioeconomics, education, health, culture and public information, GBV and human trafficking prevention.[97]

In 2011, gender has been considered in the government planning at the levels of province (*marz*) and within the city planning in Yerevan by creating standing committees on gender issues.[98] The standing committees develop annual action plans on gender equality and GBV identifying the activities for implementation and introducing local gender policy.

Despite these efforts to embrace gender equality, it does not appear adequate to bring about the fundamental and vital change in the mindsets and practices as shown in the gender statistics collected by research and international organizations including women NGOs.

In the Global Leaders' Meeting on Gender Equality and Women's Empowerment on 27 September 2015, Armenia committed to ensure the effective implementation of the law on equal rights and opportunities of women and men, and to ratify the Council of Europe Convention on Preventing and Combating Violence against Women and Domestic Violence.[99]

IV. Gender Issues in Energy Efficiency

Due to Armenia's high dependence on energy imports, users become vulnerable to fluctuating energy prices, reliability of supply, and potential supply gaps. In 2013, more than half of the population (64.2%) live in the urban areas and 32.3% of the urban population are below the national poverty line.[100,101] Provision of space heating in residential and public buildings will be a challenge in terms of affordability and reliability. According to the World Bank, about 15% of the disposable income of poor households accounts for energy use.[102] Electricity costs were particularly high for education buildings and many schools close down during winter since they cannot provide adequate space heating.[103] Given the demographics in Armenia, women suffer more from these impacts than men.

One of the major reasons for unemployment is family circumstances (82.3%) and most of the unemployed women represents widowed, divorced, single and married.[104] Given the role of women in Armenia and the higher female unemployment rate, this suggests that most women spend more time at home. Literacy rate is high and thus, women can play a key role in household energy use and energy efficiency projects that if given the opportunity can make and influence decisions to improve the situation. With appropriate information and awareness, they can also educate and shape their

[96] The Government of the Republic of Armenia. Councils. http://www.gov.am/en/councils/.

[97] Republic of Armenia Gender Policy Strategic Action Plan for 2011-2015. http://www.un.am/res/Gender%20TG%20docs/national/2011-2015_Gender%20Policy_NAP-Eng.pdf.

[98] ADB. Armenia Country Gender Assessment. 2014. http://www.adb.org/documents/armenia-country-gender-assessment.

[99] Commitment Statement at the Global Leader's Meeting on Gender Equality and Women's Empowerment. New York, 27 September 2015. http://www.unwomen.org/~/media/headquarters/attachments/initiatives/stepitup/commitments-speeches/armenia-stepitup-commitmentstatement-201509-en.pdf?v=1&d=20151005T172650.

[100] UN Data. Country Profiles. Armenia. http://data.un.org/CountryProfile.aspx?crName=ARMENIA.

[101] UN Data. Statistics. Population below national poverty line. http://data.un.org/Data.aspx?d=MDG&f=seriesRowID%3A582#f_10

[102] World Bank Group-Armenia Partnership April 2015. Country Program Snapshot. http://www.worldbank.org/content/dam/Worldbank/document/Armenia-Snapshot.pdf.

[103] GCF Funding Proposal, 15 September 2015.

[104] National Statistical Service of Republic of Armenia. Women and Men in Armenia 2014. pp. 126-127. http://www.armstat.am/file/article/gender__09.10.2014.pdf.

children's future energy consumption habits. Many women are interested in energy-efficiency projects but the limited or lack of awareness prevent them from adopting new energy saving technology and efficiency options.[105]

While there have been projects to improve energy supply and energy efficiency as well as gender assessments that have been conducted for Armenia, there have not been any comprehensive assessments on how gender is implicated in these projects or measurements of benefits that women received.[106] In addition, energy efficiency projects have been assumed that men and women benefit in the same way.

In 2006, the Government of Armenia (GoA) established the Renewable Resources and Energy Efficiency Fund, which aims to facilitate investments in energy efficiency and renewable energy based on the provisions set forth in the 2004 Law on Energy Efficiency and Renewable Energy.[107] There have been studies to monitor the social benefits of the energy efficiency projects they funded but there were no sex-disaggregated data to reflect gender balance on social benefits.[108]

The World Bank granted $10.66M to Armenia in 2012 mainly on energy efficiency investments in public facilities. This support allowed for the implementation of energy-efficiency retrofits in 44 facilities that reduced energy consumption by 216 million kilowatt-hour during the economic life of the investments made, and showed an average energy savings of up to 50% during the 2013-2015 winter season.[109] There were no published sex-disaggregated data on the implications of these energy efficiency projects.

To demonstrate that there is no gender inequality in benefits from energy efficiency projects, it is important to recognize the value of establishing the baseline data. Collection of sex-disaggregated data can show if there is gender equality on access to credit, extension, and training. It will be an opportunity for this project to collect baseline sex-disaggregated data from past and ongoing energy efficiency projects in Armenia not only on benefits but also on access to social and financial capital to initiate small-scale changes in energy efficiency.

In 2011, standing committees on gender-related issues were created at the levels of regional administration (*Marzpetaran*) and in the 12 districts of Yerevan to assist in introducing gender policy in communities and in developing annual gender policy action plan.[110] With this initiative, the Municipality of Yerevan must have built the capacity in managing gender issues. The project will be an opportunity to recognize that collection of sex-aggregated baseline data is critical in monitoring the development impacts of energy efficiency projects.

V. Recommendations

Prior to implementation of building retrofit works, MoNP will collect available secondary data from past and ongoing energy efficiency projects in Armenia that can be used to establish baseline and in setting targets to address gender equality issues particularly those related to the access to finance, training, and other benefits generated by project implementation.

During project implementation, qualitative assessments can be conducted on the gender-specific benefits that can be directly associated to the project. This will be incorporated in the annual Project Implementation Report, Interim Independent Evaluation Report, and Final Independent Evaluation Report. Indicators to quantify the achievement of project objectives in relation to gender equality will include data on proportion of men and women who had access to affordable capital for energy efficiency retrofits, number of men and women who obtained jobs created by the project, and benefited from training opportunities, knowledge management and information dissemination.

[105] ADB. Armenia Country Gender Assessment. 2014. http://www.adb.org/documents/armenia-country-gender-assessment.

[106] Ibid, p.73.

[107] Armenia Renewable Resources and Energy Efficiency Fund. http://r2e2.am/en/about-us/.

[108] http://r2e2.am/en/2011/06/studies/

[109] World Bank Group-Armenia Partnership April 2015. Country Program Snapshot. p.16. http://www.worldbank.org/content/dam/Worldbank/document/Armenia-Snapshot.pdf.

[110] UN Women. National Review of Armenia. http://www.unwomen.org/~/media/headquarters/attachments/sections/csw/59/national_reviews/armenia_review_beijing20.ashx?v=1&d=20140917T100717.

Table 1. Gender mainstreaming: proposed action plan

Objective	Action	Indicator	Responsible Institution
Output 1: A working building sector MRV, knowledge management, and MRV information disseminated			
Ensure gender balanced employment	Contracting women in civil works (if available), financial and customer services, and female engineers Liaise with the local labor bureau and construction companies to help inform women of the availability of jobs (direct and indirect) during construction Require contractors or ESCOs to employ local labor including women, as appropriate	Number of women and men employed through jobs created from the project Number of men and women small-scale service providers such as food services during project implementation	MoNP and Municipality of Yerevan
Ensure users' outreach, information campaign, and development of communication and dissemination strategy includes women	Consult both men and women on type of information needs during scoping Develop information-awareness material on MRV, EMIS, energy efficiency building retrofit, details on how to access affordable capital for building retrofits, as appropriate and ensure that it is disseminated among and used by women and men Conduct online survey after use of project website capturing gender of users Include female-headed households in workshops and ensure that they have equal participation in the project Conduct online survey after use of project website capturing gender of users Ensure that information material is gender sensitive Mobilize women's groups to promote consumer energy efficiency awareness	Number of women and men trained in using MRV and EMIS energy efficiency building retrofits Number of programs or fairs to promote energy efficiency Number of men and women users of project website Number of women's group involved	MoNP and Municipality of Yerevan
Output 2: Selected policy instruments, facilitated market, and developed building sector energy efficiency projects to promote energy efficiency investments			
Active women participation in developing new energy efficiency building codes and standards, and in developing energy efficiency projects	Encourage HMCs and installers/suppliers who can act as facilitators for connecting HOAs with lending products to involve women. Require banks to include female professionals in training on appraising investments (including risk assessment) and developing pipeline projects Identify and invite women head of HOAs or members in developing lending products	Number of women and men who participated in town hall meetings, focussed group meeting, etc. Number of women and men HOAs head and members involved as facilitators Number of men and women professionals trained on appraising investments and developing energy efficiency projects	MoNP and Municipality of Yerevan
Output 4: Available and affordable capital for energy efficiency building retrofit			
Female-headed households have equal access to affordable capital	Provide technical and administrative support to facilitate access Coordinate in identifying legitimate target households	Number of female-headed households who received funding Number of beneficiaries (disaggregated by sex and age) in the female-headed households	MoNP and Municipality of Yerevan

Objective	Action	Indicator	Responsible Institution
Improved quality of life of households who received financial support	Monitor improvements through socio-economic impact assessment data collection	Reduction in electricity bills; % of income spent on space heating Total number of men/women beneficiaries of project Number of days schools are open due to improvement Qualitative assessment of health and socio-economic improvement	

Annex 7. Map of Project Location

Annex 8. Monitoring Plan

Monitoring	Indicators	Description	Data source/Collection Methods	Frequency	Responsible for data collection	Means of verification	Assumptions and Risks
SDG indicator	(7.3.1) Energy intensity measured in terms of primary energy and GDP	Megajoules per USD constant 2011 PPP GDP (Units)	http://unstats.un.org/sdgs/indicators/database/ for Armenia)	Annually. Reported in DO tab of the Annual Project Report	Project data will be collated and shared with the National Statistical Service and other bodies monitoring SDG indicators	National statistics report	Coordination with and continued reporting by National Statistical Services
	(1.5.1) Number of new development partnerships	Number of new development partnerships with funding for improved energy efficiency and/or sustainable energy solutions targeting underserved communities / groups and women	See "Indicator Assessment" note following this table.	Annually. Reported in DO tab of the Annual Project Report	UNDP Country Office; Project consultant	Project plans, signed agreements, MoUs, financial reports and budgets. These may be available on partners' websites, through media reports or direct communication with the partners involved. Consulting reports	
	Number of direct project beneficiaries	Total number of direct beneficiaries of the project (disaggregated by sex and age)	Reported data from project monitoring component	Annually. Reported in DO tab of the Annual Project Report	UNDP Country Office; Project consultant	Consulting reports	Sufficient uptake of the incentives among the target market
	Tonnes of carbon dioxide equivalent (tCO_2eq) reduced or avoided	Tonnes of carbon dioxide equivalent (tCO_2eq) reduced or avoided as a result of	Reported data from project monitoring component	At project end	UNDP Country Office, international expert	EMIS system to be set up in Component 1 of the Project, Project reporting	Housing units and buildings are more resource-efficient and comfortable (and

Monitoring	Indicators	Description	Data source/Collection Methods	Frequency	Responsible for data collection	Means of verification	Assumptions and Risks
buildings, cities, industries and appliances		Fund-funded projects / programmes					yet more affordable) at both high and low temperatures and thus subject to reduced long-term climate impacts
	Cost per tCO_2eq, defined as total investment cost / expected lifetime emission reductions	Cost per tCO_2eq, defined as total investment cost / expected lifetime emission reductions	Reported data from project monitoring component	At project end	UNDP Country Office, international expert	Project monitoring data on costs plus data from the indicator on tonnes of CO_2eq reduced	
	Volume of finance leveraged by the project and as a result of the Fund's financing	Volume of finance leveraged by the project and as a result of the Fund's financing, disaggregated by public and private sources	Project reporting. These may be available through reports or direct communication with the partners involved.	At project end	UNDP Country office	Project reporting.	
Project Outcome							
M5.0 Strengthened institutional and regulatory systems	5.1 Institutional and regulatory systems that improve incentives for low-emission planning and development and their effective implementation	Although this can be informed by GEF Indicator 5, the World Bank's RISE (Readiness for Investment in Sustainable Energy) work, and Bloomberg New Energy Finance (BNEF) Climatesope work, consideration will be made to avoid country and sector-level requirements for this indicator. Consideration should	Project reporting. These may be available through reports or direct communication with the partners involved.	At project end	UNDP Country office, Implementing Entity	Score on World Bank RISE indicators for buildings sector (see the Annex 8)	Strengthened institutional and regulatory systems lead to practical change and do not remain on paper

Monitoring	Indicators	Description	Data source/Collection Methods	Frequency	Responsible for data collection	Means of verification	Assumptions and Risks
		be given to what can be measured at different levels (city, regional, etc.) and what changes can be tied to the work of the Fund, either in an attribution or contribution sense.					
M7.0 Lower energy intensity of buildings, cities, industries and appliances	7.1 Energy intensity / improved efficiency of buildings, cities, industries and appliances as a result of Fund support	Informed by MDB/IFI GHG accounting harmonization work on energy efficiency; can also be informed by IEA and SE4ALL Global Tracking Framework where relevant.	Project reporting. These may be available through reports or direct communication with the partners involved. Will need to be calculated sector-by-sector; different methodologies apply to buildings.	At project end	UNDP Country office, Implementing Entity, other partners	Reported data from project monitoring component	Rebound effect due to lower energy intensity is limited
Robust MRV for the building sector established *(Output 1 – Establishment of building sector MRV and knowledge management)*	Establishment of a web-based, publicly accessible MRV database	Refers to: Component 1 – Establishment of building sector MRV and knowledge management	Project reporting, evidence of MRV database and its public access	Mid-term and final	UNDP Country office, Implementing Entity, project consultants	Project reporting	MRV systems continue producing data after project end
National, sub-national and local authorities adopt and implement an enabling policy framework for EE retrofits *(Output 2 – Policy de-risking)*	Institutional and regulatory systems that improve incentives for low-emission planning and development and their effective implementation	Refers to: Component 2 – Policy derisking. See indicator 5.1 above	Reported data from project monitoring component	Annually. Reported in DO tab of the Annual Project Report	UNDP Country Office; Project consultant	Project plans, signed agreements, MoUs, financial reports and budgets. These may be available on partners' websites, through media reports or direct communication	

Monitoring	Indicators	Description	Data source/Collection Methods	Frequency	Responsible for data collection	Means of verification	Assumptions and Risks
						with the partners involved. Consulting reports	
Access to affordable capital for EE retrofits provided *(Output 3 – Financial de-risking)*	Value of loans for building renovation provided	Refers to: Component 3 – Financial de-risking	Reported data from project monitoring component	Mid-term and final	UNDP Country office, Implementing Entity, project consultants, project partners	Reporting from project monitoring component	The Government continues to bring energy prices in line with market prices Level of skills among local professionals is maintained at a level that can support market growth Lenders make use of learning opportunities offered by the financial mechanisms supported in this project
Affordability of EE retrofits for most vulnerable households ensured through targeted financial incentives to building / apartment owners / ESCOs *(Output 4 – Financial incentives)*	Number of vulnerable beneficiaries (lowest quintile of household income) with improved building energy efficiency	Refers to: Component 4 – Financial incentives	Project repots, review of applications	Mid-term and end of project	Project Manager, UNDP CO, project consultants	Applications submitted for the financial incentives scheme, Project reporting	Targeted financial incentives are aligned with the capital provided for energy efficiency retrofits, effectively leading to the implementation of retrofits

Monitoring	Indicators	Description	Data source/Collection Methods	Frequency	Responsible for data collection	Means of verification	Assumptions and Risks
Project Output / GCF Activities							
1.1 MRV systems for the buildings sector in Armenia established	Development and coverage of MRV system and database	Developed and in use for renovated buildings: full coverage of buildings retrofitted in this project	MRV framework, including guidelines and monitoring methodologies for the various categories of buildings	Mid-term and end of project	Project Manager, UNDP CO, project consultants	Regular project reporting	Building occupants agree to cooperate with the implementation of MRV systems
1.2 Knowledge management and MRV information disseminated	Existence and implementation of a plan for sharing lessons learned Number of men and women users of project website Number of women's group involved		Verification of existing of plan for sharing lessons Website and existing portal, 'Energy Efficient Buildings in Central Asia and Armenia' at www.beeca.net (in English and Russian), will present and share all relevant materials and case studies with EE practitioners in Armenia and other transition countries with similar climate and policy Survey of beneficiaries, including number of women and women's groups involved	Mid-term and end of project	Project Manager, UNDP CO, project consultants	Lessons sharing plan Website and portal Survey of beneficiaries	Learning opportunities offered by this project lead to sustained lending for energy efficiency investments
2.1 Public instruments for the promotion of investment in energy efficiency selected	UNDP's framework to support policy-makers in selecting public instruments to promote energy efficiency investment in developing countries used, adapted as necessary	Number of public instruments selected	Verification of report regarding framework to support policy-makers	Mid-term and end of project	Project Manager, UNDP CO, project consultants	Report on implementation of the framework	Policy-makers follow through on implementation of the selected instruments

Monitoring	Indicators	Description	Data source/Collection Methods	Frequency	Responsible for data collection	Means of verification	Assumptions and Risks
2.2 Support provided to on-going legal reform in the field of energy efficiency	Binding legislation on building codes and adequate secondary legislation adopted	Regulatory policy adopted Adoption regarding renovated buildings	Verification of regulatory policy adopted Verification of use regarding renovated buildings: full coverages or buildings retrofitted in this project	Mid-term and end of project	Project Manager, UNDP CO, project consultants	National legislation	UNDP's working relationship with the Government is effectively employed to maintain the momentum for legal reform
2.3 Support provided for the creation of an enabling policy framework for energy efficiency retrofits in multi-owner residential buildings	Adequate secondary legislation – providing a clear and effective set of functional models and a standard set of rules for multi-owner building management bodies to undertake energy efficiency retrofits – developed, introduced and enforced	Sub-sector plans reflect key policy targets Regulatory framework developed	Verification of regulatory framework developed Verification of regulatory framework	Mid-term and end of project	Project Manager, UNDP CO, project consultants	National legislation	UNDP's working relationship with the Government is effectively employed to maintain the momentum for creation of an enabling policy framework
2.4 Support provided to building owners / managers / owner associations / ESCOs on legal matters related to energy efficiency retrofit projects	Business models for repayment of EE investments implemented	Strong proposal defined with buy-in from stakeholders confirmed Financial mechanism in operation with evidence of stability	Written proposals that have been developed for business models Evidence of financial mechanism operationalization and stability provided	Mid-term and end of project	Project Manager, UNDP CO, project consultants	Regular project reporting	
2.5 Exit strategy measures implemented	Additional exit strategy measures designed and implemented	Arrangements providing for long-term and financially sustainable continuation of	Written exit strategy Government documents	Mid-term and end of project	Project Manager, UNDP CO	Regular project reporting	Exit strategy succeeds in maintaining the momentum created by the

Monitoring	Indicators	Description	Data source/Collection Methods	Frequency	Responsible for data collection	Means of verification	Assumptions and Risks
		project outcomes and results beyond completion of the project will be identified, discussed with stakeholders and implemented before the end of the project's lifetime					project and leads to local stakeholders continuing to further develop the market
3.1 Technical assistance provided to banks and other financial institutions	Capacity of banks to develop and market products for energy efficiency retrofits in individual houses Number of men and women professionals trained on appraising investments and developing energy efficiency projects	Number of banks have the capacity to develop and market products for energy efficiency retrofits in individual houses Trained professionals	Survey Training rosters	Mid-term and end of project	Project Manager, UNDP CO	Survey of bank employees	Banks are interested and participate in capacity building to enable them to deliver energy efficiency projects in individual houses and buildings
3.2 Technical assistance for HOA market facilitation provided to banks	Capacity of banks to develop and market products for energy efficiency retrofits in multi-owner residential buildings	Number of banks having the capacity to develop and market products for energy efficiency retrofits in multi-owner residential buildings	Survey	Mid-term and end of project	Project Manager, UNDP CO	Survey of bank employees	Banks are interested and participate in capacity building to enable them to deliver energy efficiency projects in multi-owner residential buildings
3.3 Technical assistance provided to local government to develop energy	Capacity of local government to develop energy efficiency retrofit projects for	Percentage of local government employees believing local government has the capacity to	Survey	Mid-term and end of project	Project Manager, UNDP CO	Survey of local government employees	Local government is interested and participates in capacity building to enable it to

Monitoring	Indicators	Description	Data source/Collection Methods	Frequency	Responsible for data collection	Means of verification	Assumptions and Risks
efficiency retrofit projects for publicly-owned buildings	publicly-owned buildings	develop EE retrofit projects for publicly-owned buildings					deliver energy efficiency projects in public buildings
3.4 Access to affordable capital for energy efficiency retrofits provided	Amount and number of loans for building renovation provided	Carry out a verification of investment proposals. Confirm eligibility of technology / installers, reasonable, market-level costs and justifiable technology, delivery and installation	Verification of funded investments by independent audit companies to be contracted by the Project	Carry out spot checks of selected investments before, during and after investment, as needed.	Independent audit companies	Reported data from project monitoring component	Economic situation continues to improve
3.5 Marketing platform created	Marketing materials developed and platform created	All marketing materials developed under the project. Marketing platform as related to the project.	Reports viewed, website/platform viewed	Once at end	Project Manager, UNDP CO	Marketing materials, project reporting	Marketing campaign successfully raises awareness of the opportunities offered by building energy efficiency retrofits

Monitoring	Indicators	Description	Data source/Collection Methods	Frequency	Responsible for data collection	Means of verification	Assumptions and Risks
4.1 Targeted financial incentives provided to vulnerable groups to help address the affordability gap	Financial mechanism to provide targeted financial incentives in place and incentives provided Number of female-headed households who received funding Number of beneficiaries (disaggregated by sex and age) in the female-headed households	Existence of financial mechanism as designed and executed under the project Review of households to determine number of those headed by females Among female-headed households, determination of beneficiaries to be disaggregated by sex and age		Mid-term and end of project	Project Manager, UNDP CO	Reported data from project monitoring component	Sufficient uptake of the financial incentive among the target market of vulnerable home-owners
Interim Independent Evaluation	N/A	N/A	To be outlined in IIE inception report	Once at mid-term of project	*Independent evaluator*	Completed IIE	
Environmental and social risks and management plans, as relevant	N/A	N/A	Updated SESP and management plans	Ongoing	Project Manager UNDP CO	Updated SESP	
Gender action plan	See Annex 6	See Annex 6	See Annex 6	Ongoing	Project Manager UNDP CO	See Annex 6	See Annex 6

Indicator assessment

Indicators from the GCF mitigation performance measurement framework

The GCF has three core indicators for Fund-level Impacts:

- Tonnes of carbon dioxide equivalent (tCO_2eq) reduced or avoided as a result of Fund-funded projects/programmes
- Cost per tCO_2eq, defined as total investment cost / expected lifetime emission reductions
- Volume of finance leveraged by the project and as a result of the Fund's financing, disaggregated by public and private sources

Proposed methodologies for these core indicators are described in Annex V to the document GCF/B.08/07. The Project will follow these methodologies unless they are replaced in future decisions of the GCF Board.

Indicator from the UNDP Integrated Results and Resources Framework

The project results framework includes Output 1.5 of the UNDP Integrated Results and Resources Framework (IRRF): Inclusive and sustainable solutions adopted to achieve increased energy efficiency and universal modern energy access. The related indicator is:

Indicator 1.5.1 Number of new development partnerships with funding for improved energy efficiency and/or sustainable energy solutions targeting underserved communities/groups and women

The indicator is defined as follows:

IRRF Indicator 1.5.1: Number of new development partnerships with funding for improved energy efficiency and/or sustainable energy solutions targeting underserved communities/groups and women	
Indicators to be monitored by the Country office:	
1.5.1: Number of new development partnerships with funding for improved energy efficiency and/or sustainable energy solutions targeting underserved communities/groups and women	
Indicator Description (relevant to CO Indicator/s):	
This indicator is intended to measure the results of UNDP's direct support in brokering new partnerships to fund improved energy efficiency and/or sustainable energy solutions targeting underserved communities/groups and women. It does so by enumerating (counting) the number of new partnerships supported by UNDP (e.g. through brokering, advocacy, convening) which specifically aim to improve energy efficiency and/or create sustainable energy solutions. Energy efficiency measures include those which reduce energy use while maintaining the same level of energy service than under baseline conditions. Sustainable energy solutions: include the following renewable energy sources: solar, wind, ocean, hydropower, biomass, geothermal resources, and biofuels and hydrogen derived from renewable resources. Communities and groups which are considered underserved are those that lack access to reliable and affordable energy services to meet basic human needs.	
Type of Indicator (relevant to CO Indicator/s):	Quantitative
Unit of measure (relevant to CO Indicator/s):	Number (of new development partnerships with funding)
Data disaggregation (relevant to CO Indicator/s):	None
Data Components (relevant to CO Indicator/s):	
1.5.1.A.1.1 Number of new development partnerships with funding for improved energy efficiency and/or sustainable energy solutions targeting underserved communities/groups and women	
Approach to collection of data, measurement and calculation (for common terminology follow hyperlinks)	
In order to collect data for this indicator the CO should firstly identify those new partnerships which are facilitated through UNDP interventions (e.g. advocacy, brokering and convening) to fund and/or deliver improved energy efficiency and/or sustainable energy solutions. Partnership types could include (*but not limited to*): i) Public sector partnerships; (ii) Private sector partnerships (iii) Public-Private Partnerships (iv) Civil Society Partnerships.	

To be counted as a result against this indicator the partnership must include two or more parties with an agreement (i.e. a signed, legally binding contract, or a signed memorandum of understanding) to fund improved energy efficiency and/or sustainable energy solutions targeting underserved communities/groups and women. In addition, funding must be committed or earmarked for the purposes of running the partnership and its activities and such a budget must exist for one or more years. For the purposes of reporting on this indicator, the partnership must therefore meet all the following criteria: (1) there is an agreement or MOU in place for the partnership between two or more parties; (2) it is funded; (3) and there are plans in place to fund and/or deliver improved energy efficiency and/or sustainable energy solutions which; (4) specifically target underserved communities/groups and women. Evidence will be required to verify that the partnerships report meet these criteria.
Data/evidence sources
Data and evidence for this indicator are likely to be sourced directly from the parties engaged in the partnership, such as project plans, signed agreements, MoUs, financial reports and budgets. This may be available on partners' websites, through media reports or direct communication with the partners involved.
Tips for setting baselines, milestones and targets
Baseline: The number of development partnerships supported by UNDP from the beginning of the project to 31 December 2013 (or latest data available prior to that) for all on-going projects. For all new projects, the baseline will be zero. **Target:** Total number all new partnerships that will be supported by UNDP in the next 4 years, including the baseline number. **Milestone:** New partnerships to be supported annually towards the target, as at 31 December 2014, 2015 and 2016, including the baseline number and previous years' milestones. **Please note: do not count sustained partnerships as new each year, to avoid double-counting.**

Partnership is an arrangement in which two or more parties agree to cooperate to advance their mutual interests. The applicable partnerships will be among the following types of partners:

- National government
- Regional government
- Local government
- Large company/business (including multinationals)
- Medium-sized business
- Small business
- Academia
- International NGOs
- National NGOs
- Community-based organisations

Partnership-type in this context refers to the type of partnership strategy developed. For example, a 'public-private' partnership where Government joins with business to work in partnership to achieve agreed goals; or a 'cross-sector' partnership where organisations working in different fields agree to cooperate; or a 'learning' partnership to further the dissemination of lessons or pursue research.

RISE indicators

World Bank 'Readiness for Investment in Sustainable Energy' (RISE) indicators present a scalar means of capturing the strength of policies in promoting enabling environments and the readiness for attracting private sector participation and investment in building retrofits.

The indicators include elements of the business environment considered essential in energy efficiency investments across planning and policies and regulations. For the investor, this provides important evidence and an indication about the commitment and credibility of government policy-making to create an attractive enabling environment for investment in energy efficiency building retrofits. For policy-makers, these indicators provide important evidence of elements that need improvement.

A rating of Armenia's policy and legislative framework was carried out as one of the pilot countries for RISE[111]. The indicators are formulated in a binary form with scores of 0 or 100 to indicate presence or

[111] World Bank, 2014. Pilot Report: RISE – Readiness for Investment in Sustainable Energy: A Tool for Policymakers. For information about RISE see: http://rise.worldbank.org/

not of a particular policy to ensure objectivity, and 50 was used when the condition was partially met. The factors were then aggregated to make a comprehensive presentation of Armenia's achievement on that indicator.

The Table 7 below provides the relevant RISE indicators for public and residential buildings. The score column indicates the official status of the indicator as measured in the RISE pilot, while the next two columns represent the target at medium-term and the end of the GCF project.

Table 7. Armenian RISE indicators[112]

Category	Indicator	Question	Armenia	Current Score	Project mid-term	End of project
	National Plan for Increasing Energy Efficiency	Residential target	Yes	100	100	100
	Entities for Energy Efficiency Policy, Regulation and Implementation	Certifying compliance with building energy efficiency standards	No	0	100	100
	Quality of Information Provided to Consumers about Electricity Usage	Do consumers receive reports of their electricity usage?	Yes	100	100	100
	Quality of Information Provided to Consumers about Electricity Usage	If yes, at what intervals do they receive these reports?	Monthly			
	Quality of Information Provided to Consumers about Electricity Usage	If yes, do the reports include price levels?	Yes	100	100	100
	Quality of Information Provided to Consumers about Electricity Usage	If yes, do customers receive a bill or report that shows their electricity usage over time?	Yes	100	100	100
	Quality of Information Provided to Consumers about Electricity Usage	If yes, do customers receive a bill or report which compares them to other users in the same region and/or class?	No	0	0	100
	Quality of Information Provided to Consumers about Electricity Usage	Do utilities provide customers with information on how to use electricity more efficiently, whether through bills or other means?	No	0	0	100
	Incentives or Mandates for Public Entities to Invest in Energy Efficiency	Are there binding energy savings obligations for the following?	...			
	Incentives or Mandates for Public Entities to Invest in Energy Efficiency	Public buildings	No	0	100	100
	Incentives or Mandates for Public Entities to Invest in Energy Efficiency	If yes, are energy savings from efficiency activities at public buildings tracked?	n/a	0	100	100
	Incentives or Mandates for Public Entities to Invest in Energy Efficiency	Can public entities engage in multi-year contracts with service providers?	Yes	100	100	100
	Incentives or Mandates for Public Entities to Invest in Energy Efficiency	Do public budgeting regulations and practices allow public entities to retain energy savings at the following level?	...			
	Incentives or Mandates for Public Entities to Invest in Energy Efficiency	At the national/central level	No	0	100	100
	Incentives or Mandates for Public Entities to Invest in Energy Efficiency	At the municipal level	No	0	100	100

[112] Source: http://rise.worldbank.org/

Category	Indicator	Question	Armenia	Current Score	Project mid-term	End of project
	Building Energy Codes	Are there energy codes for the following:	**...**			
	Building Energy Codes	New residential buildings	Partial	50	100	100
	Building Energy Codes	If yes, is there any provision for regular updates to the energy code for residential buildings?	Partial	50	100	100
	Building Energy Codes	New commercial buildings	Partial	50	50	50
	Building Energy Codes	If yes, is there any provision for regular updates to the energy code for commercial buildings?	Partial	50	50	50
	Building Energy Codes	Is there a system to ensure compliance with building energy codes?	Partial	50	100	100
	Building Energy Codes	Are renovated buildings required to meet a building energy code, in the following sectors?	**...**			
	Building Energy Codes	Residential	No	0	0	100
	Building Energy Codes	Commercial	No	0	0	100
	Building Energy Codes	Is there a standardized rating or labelling system for the energy performance of existing buildings?	No	0	0	100
	Building Energy Codes	Are commercial and residential buildings required to disclose property energy usage at the point of sale or when leased?	No	0	0	100
	Building Energy Codes	Are large commercial and residential buildings required to disclose property energy usage annually?	No	0	0	0
		Average score		**34**	**64**	**91**

Annex 9. Evaluation Plan

Evaluation Title	Planned start date Month/year	Planned end date Month/year	Included in the Country Office Evaluation Plan	Budget for consultants[113]	Other budget (i.e. travel, site visits etc…)	Budget for translation
Interim Independent Evaluation	The Interim Independent Evaluation is to start at least 3 months before the halfway point between Project Document signature and the schedule end of the project: December/2019	The Interim Independent Evaluation Report is to be submitted to the GCF Secretariat in the year marking the halfway point between Project Document signature and the schedule end of the project: March/2020	Yes *Mandatory*	*USD 30,000*	*In country travel will be organized by UNDP vehicle*	*USD 2,500*
Final Independent Evaluation	The Final Independent Evaluation is to start at least 6 months before operation closure: September/2022	The Final Independent Evaluation Report is to be submitted to the GCF Secretariat 3 months before the scheduled end of the project: March/2023	Yes *Mandatory*	*USD 50,000*	*In country travel will be organized by UNDP vehicle*	*USD 4,500*
			Total evaluation budget	**USD 87,000**		

[113] The budget will vary depending on the number of consultants required (for full size projects should be two consultants); the number of project sites to be visited; and other travel related costs. Average # total working days per consultant not including travel is between 22-25 working days.

Annex 10. Timetable of project implementation

The following table provides an indicative project/programme implementation timetable that corresponds to Section H, the Logical Framework of the FAA, including the numbered outputs and activities as well as other relevant administrative outputs, e.g. reports, disbursement schedule, etc. All milestone references and symbols are defined in footnotes or specified in the timetable. The duration of the activity is shaded.

	2017				2018				2019				2020				2021				2022				2023	
	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2
1. Output 1 Establishment of Building Sector MRV																										
Activity 1.1 *MRV systems for the buildings sector in Armenia established*																										
Sub-activity 1.1.1 Development of the MRV framework, including guidelines and monitoring methodologies for the various categories of buildings																										
Sub-activity 1.1.2 Support to full implementation of building EMIS in selected buildings for demonstration and capacity building purposes																										
Activity 1.2 *Knowledge management and MRV Information disseminated*																										
Sub-activity 1.2.1 Identify appropriate formats for reaching the relevant stakeholders																										
Sub-activity 1.2.2 Establish a website that will provide information and a platform for communication between the different stakeholders																										

	2017				2018				2019				2020				2021				2022				2023	
	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2
Sub-activity 1.2.3 Information dissemination to maximize the impact potential of the project in Armenia and beyond																										
Sub-activity 1.2.4 Provision of information to consumers																										
2. Output 2. Policy De-Risking																										
Activity 2.1 *Public instruments for the promotion of investment in EE selected*																										
Sub-activity 2.1.1 Support to policy-makers in selecting public instruments using UNDP's de-risking framework to promote sustainable energy investment in developing countries																										
Activity 2.2 *Support provided to on-going legal reform in the field of energy efficiency*																										
Sub-activity 2.2.1 Support to national, sub-national and local authorities to adopt and implement an enabling policy framework for energy efficiency retrofits																										
Sub-activity 2.2.2 Support to the gradual introduction of binding legislation on energy auditing, energy																										

	2017				2018				2019				2020				2021				2022				2023	
	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2
passports/certificates and labelling for existing buildings																										
Sub-activity 2.2.3 Support to the introduction of legislation specific to public buildings' energy efficiency retrofits																										
Activity 2.3 *Support provided for the creation of an enabling policy framework for energy efficiency retrofits in multi-owner residential buildings*																										
Sub-activity 2.3.1 Support to policy-makers in developing policy relating to HOA legal status, payment enforcement, professional management and consensus levels																										
Activity 2.4 *Support provided to building owners / managers / owner associations / ESCOs on legal matters related to energy efficiency retrofit projects*																										
Sub-activity 2.4.1 Provide support on legal matters related to energy efficiency retrofit projects for multi-owner buildings																										
Sub-activity 2.4.2 Provide support for establishing ESCOs																										

	2017				2018				2019				2020				2021				2022				2023	
	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2
Activity 2.5 *Exit strategy measures implemented*																										
Sub-activity 2.5.1 Development and implementation of the exit strategy																										
3. Output 3 Financial De-Risking																										
Activity 3.1 *Technical assistance provided to banks and other financial institutions*																										
Sub-activity 3.1.1 Provide support to banks to develop and market products for energy efficiency in individual residences																										
Activity 3.2 *Technical assistance provided to banks for HOA market facilitation*																										
Sub-activity 3.2.1 Support to development of bank products for HOAs																										
Activity 3.3 *Technical assistance provided to local government to develop energy efficiency retrofit projects for publicly-owned buildings*																										
Sub-activity 3.3.1 Support to the process of identification, development and aggregation of technically- and financially-feasible energy efficiency retrofit projects in																										

	2017				2018				2019				2020				2021				2022				2023	
	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2
publicly-owned buildings																										
Activity 3.4 *Access to affordable capital for energy efficiency retrofits provided*																										
Sub-activity 3.4.1 Establishment and maintenance of the technical structure for the financial de-risking instruments offered																										
Sub-activity 3.4.2 Verification of funded investments																										
Activity 3.5 *Market platform created*																										
Sub-activity 3.5.1 Provide marketing support to banks																										
4. Output 4 Financial Incentives																										
Activity 4.1 *Targeted financial incentives provided to vulnerable groups to help address the affordability gap*																										
Sub-activity 4.1.1 Targeted financial incentives provided to building / apartment owners, or the ESCOs serving these clients																										
Reporting dates as per FAA																										
Inception report (including baselines assessment																										
First Annual Project Report (APR)																										
Interim Independent Evaluation Report																										

	2017				2018				2019				2020				2021				2022				2023	
	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2
Project Completion Report (last APR)																										
Final Independent Evaluation Report																										

	Indicates duration of the activity

Annex 11. Procurement plan

UNDP has comprehensive procurement policies in place as outlined in the 'Contracts and Procurement' section of UNDP's Programme and Operations Policies and Procedures (POPP). The policies outline formal procurement standards and guidelines across each phase of the procurement process, and they apply to all procurements in UNDP. See here: https://info.undp.org/global/popp/cap/Pages/Introduction.aspx

In line with NIM Guidelines and cash transfer modalities, procurement under the project will be undertaken by either Responsible Parties (EPIU of the MoNP and the Municipality of Yerevan's PMT) or by UNDP under the 'Direct Agency Implementation' modality. Wherever procurement is carried out by the Responsible Parties, it will be fully aligned with Government regulations and procedures and will also have to be compatible with UNDP's financial and procurement standards. Specifically, according to the UNDP Policies and Procedures, "UNDP has a responsibility to accept appropriate cash advance requests, reported expenses or direct payments that are consistent with the Annual Work Plan and UNDP's Financial Rules and Regulations (FRRs) and – therefore – to reject improper advance requests, expenses, or requests for direct payments. If subsequent information becomes available that questions the appropriateness of expenses recorded or direct payments already made, these should be rejected at any point up to the issuance and signature of the Combined Delivery Report".

The energy efficiency retrofits themselves will be performed by private-sector engineering companies. For public buildings, procurement will take place according to the national public procurement rules. For residential beneficiaries, procurement requirement may be specified by the banks that are providing loans, subject to on-lending requirements. The approach will be competitive / private sector-oriented, with the aim of creating a competitive sustainable market for energy efficiency retrofits in the country.

The approach to funding the four project components are as follows:

- Component 1: Competitive and open tendering for individual and company services
- Component 2: Competitive and open tendering for individual and company services
- Component 3: Competitive and open tendering for individual and company services
- Component 4: For investments that meet eligibility requirements (i.e. grants to vulnerable households), incentives funds will be provided by UNDP via municipalities or the PMT. Vulnerable households, recipients of the funds, will be selected as part of the social safety net programme, the Family Benefit Scheme, which already provide compensation to eligible households against energy price increases. The scheme uses a scoring system for household vulnerability and allocates state family benefits via Social Service Centres in each region/district. One option for provision of targeted incentives is the use of a voucher scheme given via the Social Service Centre that are passed by the beneficiary to the installer / ESCO (to be competitively selected under Component 3) and then redeemed for eligible measures following ex-post verification). Under the proposed scheme the payment will be made directly to the companies (ESCOs) against vouchers and subject to positive verification that energy efficiency measures were implemented and savings achieved.

Annex 12. Terms of reference

Post Title: Project Manager

Scope of work

Under the direct supervision of the UNDP Programme Analyst for Sustainable Growth and Resilience (SGR), and UNDP Climate Change Programme Coordinator the Project Manager will be responsible for the overall implementation of the project activities, in close partnership with the Ministry of Nature Protection of Republic of Armenia, Yerevan Municipality, State Committee for Urban Development, regional and local authorities, other sectoral institutions, and other UNDP projects.

Duties and Responsibilities

In particular, the Project Manager will be responsible for:

- Leading, supervising, and monitoring the project implementation process, including provision of advice on the UNDP activities in the area of building energy efficiency.
- Ensure the efficient operation of the Project Unit, including supervision of the project staff and national consultants.
- Ensure the development and efficient implementation of activities, as per the Project Document acting flexibly to adjust to implementing realities.
- Manage and monitor the financial performance of the Project and ensure delivery as per the project budget.
- Liaise with the Government, regional and local authorities, civil society organizations, agricultural sector stakeholders, including private companies, and international partners to ensure participatory approach for the development and implementation of project activities.
- Develop critical partnerships and networks for the specific thematic areas; participating in the activities of intergovernmental or other coordinating bodies.
- Develop reports to the implementing partners, UNDP, and funding organizations on the financial and operational status of the Project.
- Support UNDP in providing guidance and technical expertise on the formulation of project strategies and proposals in the related fields.
- Identify and develop new cooperation and respective funding opportunities to ensure meeting the project stated objectives.
- Provide input and contribute to the preparation of policy papers, reporting tools, resource mobilization and advocacy materials, for liaising with UNDP's global and regional advisors to ensure that UNDP Armenia is in line with the corporate objectives on GHG emissions mitigation agreed with donor and partner agencies.
- Contribute to the preparation of innovative and creative initiatives, blogs, interviews etc. Act as project assets custodian and ensuring that the project assets are properly inventoried and reported to UNDP.
- Perform other duties as required by UNDP.

Competencies

Corporate Competencies:

- Demonstrates integrity by modelling the UN's values and ethical standards.
- Demonstrates a passion and energy for development projects.
- Promotes the vision, mission, and strategic goals of UNDP.
- Displays cultural, gender, religion, race, nationality and age sensitivity and adaptability.
- Treats all people fairly without favoritism.

Functional Competencies:

Knowledge Management and Learning

- Promotes a knowledge sharing and learning culture in the office.
- In-depth knowledge on development issues.

- Ability to advocate and provide policy advice.
- Actively works towards continuing personal learning and development in one or more Practice Areas, acts on learning plan and applies newly acquired skills.

Development and Operational Effectiveness

- Ability to lead strategic planning, results-based management and reporting.
- Ability to lead formulation, implementation, monitoring and evaluation of development programmes and projects, mobilize resources.
- Strong IT skills.
- Ability to lead implementation of new systems, and affect staff behavioural/attitudinal change.

Management and Leadership

- Focuses on impact and result for the client and responds positively to feedback.
- Leads teams effectively and shows conflict resolution skills.
- Consistently approaches work with energy and a positive, constructive attitude.
- Demonstrates strong oral and written communication skills.
- Builds strong relationships with clients and external actors.
- Remains calm, in control and good humoured even under pressure.

Required Qualifications and Skills

Education:

Advanced university degree in energy, engineering, economics, business administration or other relevant discipline.

Experience:

- At least 5 years of relevant experience at the national or international level in project management and implementation. Hands-on experience in design, monitoring and evaluation of development projects.
- Previous experience in energy, energy efficiency, renewable energy, design/construction, sector projects.
- Experience in development of analytical documents, briefs and project proposals.

Skills:

- Ability to deliver and reach the planned project targets.
- Creativity, flexibility and an innovative approach to problem solving.
- Good interpersonal and negotiation skills.
- Strong managerial skills, proven ability to work under pressure and handle multiple activities and tasks concurrently.

Languages:

- Fluency in Armenian and English.
- in Russian is an asset.

Post Title: **Project Assistant (level SB3)**

Scope of work

Under the overall guidance and supervision of Climate Change Programme Coordinator and direct supervision of the Project Manager the Project Assistant will provide support for implementation of tasks associated with the day-to-day management and operation of the projects. S/he will be responsible for operational, administrative and financial project management support functions.

Duties and Responsibilities

The incumbent will perform the following tasks:

Projects support:

- To provide support for conducting data collection and review, compilation of background materials for use in reporting, discussions and briefing sessions, prepare components of presentations and briefings.
- To provide support to fostering and strengthening partnerships and cooperation with project stakeholders, relevant international organisations, international and local financial institutions, state institutions and CBOs/NGOs. To support in project awareness raising activities.
- To contribute to preparation of written materials, reports as per the requirements to UNDP, Government and Green Climate Fund, briefing notes, outcome board materials within the assigned area. To take notes/minutes at meetings and ensure follow up.

Administrative support:

- To support the Programme Coordinator and Project Manager in planning, daily implementation and monitoring of annual work plan activities.
- To assist the project experts' team through information dissemination, technical backstopping, report preparation, translations. To assist in drafting information for web-pages and ensure regular updates.
- To support project management during the audits and evaluations.
- To provide support for organization of seminars, press conferences, workshops, advisory board meeting and other public campaign. Draft agendas; prepare leaflets, information note, press releases for media and stakeholders.
- To maintain properly records, necessary documents on project activities, communication and transactions. Keep appropriate the filling system.
- To draft correspondence relating to assigned project areas; clarifies, follows up, responds to requests for information, ensuring proper communication and information exchange within the Project Team.
- To ensure accurate observance of administrative rules, regulations and procedures within the framework of Project and in line with UNDP SOPs for Recruitment/Procurement/Finance.
- Make all necessary arrangements for procurement/recruitment within the framework of the project. Support in preparation of procurement /recruitment plans, selection notes, expert evaluation documents.
- To make logistical arrangements for missions and expert's visits, prepares briefing kits and background materials;
- To take notes and draft minutes of working meetings, workshops, advisory board meetings, etc.
- To support with translation of relevant communication, information notes, short reports, etc.
- To maintain updated inventory of the Project's equipment, e.g. machinery, electrical, furniture, miscellaneous. Participates in Physical verification process.

- To assist the Project Manager and Programme Associate in preparation of AWP, draft budget revisions and drafts monthly, quarterly and annual financial reports for the project;
- To prepare documentation for vendors and for Request for Payments, to ensure smooth financial operation of AWP activities.

Required Qualifications and Skills

Education:

University degree in social sciences, business administration, economics, other related disciplines.

Experience:

- 3 years of relevant administrative experience is required, preferably with International organizations.
- Prior relevant experience with UNDP implemented projects will be an asset.

Competencies and skills:

- Strong interpersonal skills with ability to establish and maintain effective work relationships with people of different social and cultural background. Ability to work under time pressure and handle multiple activities. Ability to work independently and to participate effectively in a team based information sharing.
- Proven knowledge of communication tools, excellent writing skills. Experience in the usage of computers, office software packages (MS Word, Excel, etc) and office equipment; knowledge of spreadsheet and database packages, experience in handling of web based management systems is an asset.
- Fluency in English, Armenian and Russian.

Post Title:	**International Consultant on Energy Efficient Building Retrofit Project Inception Phase Preparation**
Duty Stations:	Home-country and missions to Yerevan, Armenia

Scope of work

The International Consultant is expected to work in close cooperation with the Project team during the Pre-Inception Phase, which will include: preparing for the Inception Workshop of the above-mentioned project, implementation guidance including the Operational Manual, updating the stakeholder cooperation framework, and developing the detailed work plan for the first year of implementation. The International Consultant is also expected to prepare a mission report that provides recommendations on the project implementation strategy.

Under the overall guidance of the Regional Technical Adviser for UNDP-GCF projects, under direct supervision of the UNDP Programme Analyst for Sustainable Growth and Resilience (SGR) and in close cooperation with Climate Change Related Annual Work Plans Coordinator and Project Manager,

Duties and Responsibilities

The International Consultant (acting in his/her individual capacity) will be tasked with the following specific duties and responsibilities:

1. Review, develop and/or update existing project-related documents as well as documentation requirements of the Green Climate Fund on GHG mitigation projects implementation and develop recommendations on the organization of the Project Inception phase including:
    - Update the stakeholders matrix based on recent developments in the country
    - Review management and implementation arrangements based on consultations with national responsible partners and key stakeholders
    - Elaborate the detailed work plan for the first year of implementation
    - Develop the Project Inception phase strategy and schedule.
2. Develop the Operational Manual of the Project.
3. Assist the Project team in organizing the Project Inception phase, including preparation dn arrangements for the Inception Workshop.

The International Consultant has to ensure following deliverables;

- Five day mission and mission report including updated stakeholder matrix
- Inception phase strategy and detailed workplan for the first year, with recommendations on the revised management and implementation arrangements
- Project Operational Manual
- Final Report incorporating recommendations on the project inception phase implementation strategy based on the outcomes of consultations with national and international partners, existing project documents and international practice

Competencies

- Academic qualification (at least Master's degree or equivalent) in the field of energy/ engineering, or finance/management. Holding a scientific degree is an advantage.
- At least ten (10) years of working experience as a specialist in the field of energy efficiency and energy saving and three (3) years of working experience in the climate financed projects. Proven knowledge of the requirements for low carbon development policies and projects, as well as international best practice in the field of energy efficient financial instruments.
- Working experience in CIS countries in the area of energy efficiency result based finance projects is an asset.
- Proficiency in English; proficiency in Russian is an asset.
- Good communication, analytical and writing skills.

Annex 13. UNDP Project Quality Assurance Report

Design & Appraisal Stage Quality Assurance Report

Overall Project Rating:	**Highly Satisfactory**
Decision:	Approve: The project is of sufficient quality to continue as planned. Any management actions must be addressed in a timely manner.
Project Number:	00098348
Project Title:	De-risking and Scaling-up Investment in Energy Efficient Retrofits
Project Date:	01-Nov-2016

Strategic — **Quality Rating:** Exemplary

1. Does the project's Theory of Change specify how it will contribute to higher level change? (Select the option from 1-3 that best reflects the project)

3: The project has a theory of change with explicit assumptions and clear change pathway describing how the project will contribute to outcome level change as specified in the programme/CPD, backed by credible evidence of what works effectively in this context. The project document clearly describes why the project's strategy is the best approach at this point in time.

2: The project has a theory of change. It has an explicit change pathway that explains how the project intends to contribute to outcome-level change and why the project strategy is the best approach at this point in time, but is backed by limited evidence.

1: The project does not have a theory of change, but the project document may describe in generic terms how the project will contribute to development results, without specifying the key assumptions. It does not make an explicit link to the programme/CPD's theory of change.

Evidence	Management Response
For details, please follow the link for the project document as approved by GCF in June 2016: http://www.greenclimate.fund/documents/20182/226888/GCF_B.13_16_Add.02_-_Funding_proposal_package_for_FP010.pdf/9e2c673e-1eef-4ff3-9609-d23a49c6d190	

2. Is the project aligned with the thematic focus of the UNDP Strategic Plan? (select the option from 1-3 that best reflects the project)

3: The project responds to one of the three areas of development work as specified in the Strategic Plan; it addresses at least one of the proposed new and emerging areas; an issues-based analysis has been incorporated into the project design; and the project's RRF includes all the relevant SP output indicators. (all must be true to select this option)

2: The project responds to one of the three areas of development work as specified in the Strategic Plan. The project's RRF includes at least one SP output indicator, if relevant. (both must be true to select this option)

1: While the project may respond to one of the three areas of development work as specified in the Strategic Plan, it is based on a sectoral approach without addressing the complexity of the development issue. None of the relevant SP indicators are included in the RRF. This answer is also selected if the project does not respond to any of the three areas of development work in the Strategic Plan.

Evidence

The project fully corresponds to the sustainable development principles poverty alleviation through application of Energy Efficiency innovative technologies and innovative management modalities. For details, please follow the link for the project document as approved by GCF in June 2016: http://www.greenclimate.fund/documents/20182/226888/GCF_B.13_16_Add.02_-_Funding_proposal_package_for_FP010.pdf/9e2c673e-1eef-4ff3-9609-d23a49c6d190

Relevant — **Quality Rating:** Satisfactory

3. Does the project have strategies to effectively identify, engage and ensure the meaningful participation of targeted groups/geographic areas with a priority focus on the excluded and marginalized? (select the option from 1-3 that best reflects this project)

3: The target groups/geographic areas are appropriately specified, prioritising the excluded and/or marginalised. Beneficiaries will be identified through a rigorous process based on evidence (if applicable.)The project has an explicit strategy to identify, engage and ensure the meaningful participation of specified target groups/geographic areas throughout the project, including through monitoring and decision-making (such as representation on the project board) (all must be true to select this option)

2: The target groups/geographic areas are appropriately specified, prioritising the excluded and/or marginalised. The project document states how beneficiaries will be identified, engaged and how meaningful participation will be ensured throughout the project. (both must be true to select this option)

1: The target groups/geographic areas are not specified, or do not prioritize excluded and/or marginalised populations. The project does not have a written strategy to identify or engage or ensure the meaningful participation of the target groups/geographic areas throughout the project.

Not Applicable

Evidence	Management Response
The project target are the residential buildings and the funds are envisaged for supporting the socially vulnerable strata	

4. Have knowledge, good practices, and past lessons learned of UNDP and others informed the project design? (select the option from 1-3 that best reflects this project)

3: Knowledge and lessons learned (gained e.g. through peer assist sessions) backed by credible evidence from evaluation, corporate policies/strategies, and monitoring have been explicitly used, with appropriate referencing, to develop the project's theory of change and justify the approach used by the project over alternatives.

2: The project design mentions knowledge and lessons learned backed by evidence/sources, which inform the project's theory of change but have not been used/are not sufficient to justify the approach selected over alternatives.

1: There is only scant or no mention of knowledge and lessons learned informing the project design. Any references that are made are not backed by evidence.

Evidence	Management Response
This project is a scaling up activity of the previous Energy Efficiency in Buildings UNDP/GEF project. The previous project has identified all technical parameters and piloted first ever in Armenia Energy Efficiency enveloping of the residential building.	

5. Does the project use gender analysis in the project design and does the project respond to this gender analysis with concrete measures to address gender inequities and empower women? (select the option from 1-3 that best reflects this project)

3: A participatory gender analysis on the project has been conducted. This analysis reflects on the different needs, roles and access to/control over resources of women and men, and it is fully integrated into the project document. The project establishes concrete priorities to address gender inequalities in its strategy. The results framework includes outputs and activities that specifically respond to this gender analysis, with indicators that measure and monitor results contributing to gender equality. (all must be true to select this option)

2: A gender analysis on the project has been conducted. This analysis reflects on the different needs, roles and access to/control over resources of women and men. Gender concerns are integrated in the development challenge and strategy sections of the project document. The results framework includes outputs and activities that specifically respond to this gender analysis, with indicators that measure and monitor results contributing to gender equality. (all must be true to select this option)

1: The project design may or may not mention information and/or data on the differential impact of the project's development situation on gender relations, women and men, but the constraints have not been clearly identified and interventions have not been considered.

Evidence	Management Response
The project addressing both residential and public buildings and does not specifically target men or women. The project considered to be a technical assistance to the loan from European Investment Bank hence the interventions should have a social implications however should be financially sound in the first place. Gender analyses will be provided along the implementation of the project.	

List of Uploaded Documents

File Name	Modified By	Modified
LPAC minutes_27.07.15.pdf	armine.hovhannisyan@undp.org	10/26/2016 9:09:35 AM

6. Does UNDP have a clear advantage to engage in the role envisioned by the project vis-à-vis national partners, other development partners, and other actors? (select the option from 1-3 that best reflects this project)

3: An analysis has been conducted on the role of other partners in the area where the project intends to work, and credible evidence supports the proposed engagement of UNDP and partners through the project. It is clear how results achieved by relevant partners will contribute to outcome level change complementing the project's intended results. If relevant, options for south-south and triangular cooperation have been considered, as appropriate. (all must be true to select this option)

2: Some analysis has been conducted on the role of other partners where the project intends to work, and relatively limited evidence supports the proposed engagement of and division of labour between UNDP and partners through the project. Options for south-south and triangular cooperation may not have not been fully developed during project design, even if relevant opportunities have been identified.

1: No clear analysis has been conducted on the role of other partners in the area that the project intends to work, and relatively limited evidence supports the proposed engagement of UNDP and partners through the project. There is risk that the project overlaps and/or does not coordinate with partners' interventions in this area. Options for south-south and triangular cooperation have not been considered, despite its potential relevance.

Evidence	Management Response
Details are available in Chapter C7 -Institutional / Implementation Arrangements of the project document.	

Social & Environmental Standards **Quality Rating:** Highly Satisfactory

7. Does the project seek to further the realization of human rights using a human rights based approach? (select from options 1-3 that best reflects this project)

3: Credible evidence that the project aims to further the realization of human rights, upholding the relevant international and national laws and standards in the area of the project. Any potential adverse impacts on enjoyment of human rights were rigorously identified and assessed as relevant, with appropriate mitigation and management measures incorporated into project design and budget. (all must be true to select this option)

2: Some evidence that the project aims to further the realization of human rights. Potential adverse impacts on enjoyment of human rights were identified and assessed as relevant, and appropriate mitigation and management measures incorporated into the project design and budget.

1: No evidence that the project aims to further the realization of human rights. Limited or no evidence that potential adverse impacts on enjoyment of human rights were considered.

Evidence	Management Response
The project will address issues related to the rights of the people to access affordable and quality public services, improve the level of comfort and enjoy better institutional arrangements to access loans and public funding. Human Rights based approach will be applied along the project implementaiton.	

8. Did the project consider potential environmental opportunities and adverse impacts, applying a precautionary approach? (select from options 1-3 that best reflects this project)

3: Credible evidence that opportunities to enhance environmental sustainability and integrate poverty-environment linkages were fully considered as relevant, and integrated in project strategy and design. Credible evidence that potential adverse environmental impacts have been identified and rigorously assessed with appropriate management and mitigation measures incorporated into project design and budget. (all must be true to select this option).

2: No evidence that opportunities to strengthen environmental sustainability and poverty-environment linkages were considered. Credible evidence that potential adverse environmental impacts have been identified and assessed, if relevant, and appropriate management and mitigation measures incorporated into project design and budget.

1: No evidence that opportunities to strengthen environmental sustainability and poverty-environment linkages were considered. Limited or no evidence that potential adverse environmental impacts were adequately considered.

Evidence	Management Response
Chapter E.1. of the project document refers to the Impact Potential - Potential of the project to contribute to the achievement of the Green Climate Fund's objectives and result areas	

9. Has the Social and Environmental Screening Procedure (SESP) been conducted to identify potential social and environmental impacts and risks? (If yes, upload the completed checklist as evidence. If SESP is not required, provide the reason(s) for the exemption in the evidence section. Exemptions include the following:

- Preparation and dissemination of reports, documents and communication materials
- Organization of an event, workshop, training
- Strengthening capacities of partners to participate in international negotiations and conferences
- Partnership coordination (including UN coordination) and management of networks
- Global/regional projects with no country level activities (e.g. knowledge management, inter-governmental processes)
- UNDP acting as Administrative Agent

Yes

No

SESP not required

Evidence

see attached

List of Uploaded Documents

File Name	Modified By	Modified
Annex_5_SESP.docx	diana.harutunyan@undp.org	12/28/2016 7:19:02 AM

Management & Monitoring **Quality Rating: Highly Satisfactory**

10. Does the project have a strong results framework? (select from options 1-3 that best reflects this project)

3: The project's selection of outputs and activities are at an appropriate level and relate in a clear way to the project's theory of change. Outputs are accompanied by SMART, results-oriented indicators that measure all of the key expected changes identified in the theory of change, each with credible data sources, and populated baselines and targets, including gender sensitive, sex-disaggregated indicators where appropriate. (all must be true to select this option)

2: The project's selection of outputs and activities are at an appropriate level, but may not cover all aspects of the project's theory of change. Outputs are accompanied by SMART, results-oriented indicators, but baselines, targets and data sources may not yet be fully specified. Some use of gender sensitive, sex-disaggregated indicators, as appropriate. (all must be true to select this option)

1: The results framework does not meet all of the conditions specified in selection "2" above. This includes: the project's selection of outputs and activities are not at an appropriate level and do not relate in a clear way to the project's theory of change; outputs are not accompanied by SMART, results-oriented indicators that measure the expected change, and have not been populated with baselines and targets; data sources are not specified, and/or no gender sensitive, sex-disaggregation of indicators.

Evidence	Management Response
Chapter H.1. (Logic Framework) of the project document specifies the logic framework in accordance with the GCF's Results Management Framework and Performance Measurement Framework.	

11. Is there a comprehensive and costed M&E plan with specified data collection sources and methods to support evidence-based management, monitoring and evaluation of the project?

Yes

No

Evidence

Monitoring and reporting details are describes on page 62-69 and chapter H.2 Arrangements for Monitoring, Reporting and Evaluation of the project document.

12. Is the project's governance mechanism clearly defined in the project document, including planned composition of the project board? (select from options 1-3 that best reflects this project)

3: The project's governance mechanism is fully defined in the project document. Individuals have been specified for each position in the governance mechanism (especially all members of the project board.) Project Board members have agreed on their roles and responsibilities as specified in the terms of reference. The ToR of the project board has been attached to the project document. (all must be true to select this option).

2: The project's governance mechanism is defined in the project document; specific institutions are noted as holding key governance roles, but individuals may not have been specified yet. The prodoc lists the most important responsibilities of the project board, project director/manager and quality assurance roles. (all must be true to select this option)

1: The project's governance mechanism is loosely defined in the project document, only mentioning key roles that will need to be filled at a later date. No information on the responsibilities of key positions in the governance mechanism is provided.

Evidence	Management Response
Please see chapter C7 of the project document	

13. Have the project risks been identified with clear plans stated to manage and mitigate each risks? (select from options 1-3 that best reflects this project)

3: Project risks related to the achievement of results are fully described in the project risk log, based on comprehensive analysis drawing on the theory of change, Social and Environmental Standards and screening, situation analysis, capacity assessments and other analysis. Clear and complete plan in place to manage and mitigate each risk. (both must be true to select this option)

2: Project risks related to the achievement of results identified in the initial project risk log with mitigation measures identified for each risk.

1: Some risks may be identified in the initial project risk log, but no evidence of analysis and no clear risk mitigation measures identified. This option is also selected if risks are not clearly identified and no initial risk log is included with the project document.

Evidence	Management Response
Chapter G.2. of the project document refers to Risk Factors and Mitigation Measures.	

Efficient **Quality Rating: Highly Satisfactory**

14. Have specific measures for ensuring cost-efficient use of resources been explicitly mentioned as part of the project design? This can include: i) using the theory of change analysis to explore different options of achieving the maximum results with the resources available; ii) using a portfolio management approach to improve cost effectiveness through synergies with other interventions; iii) through joint operations (e.g., monitoring or procurement) with other partners.

Yes

No

Evidence

Chapter C of the project document refers to the financing costs, financial incentives, impact the investment's life-cycle cost and other cost estimates.

15. Are explicit plans in place to ensure the project links up with other relevant on-going projects and initiatives, whether led by UNDP, national or other partners, to achieve more efficient results (including, for example, through sharing resources or coordinating delivery?)

Yes

No

Evidence

Please see chapter E of the project document.

16. Is the budget justified and supported with valid estimates?

3: The project's budget is at the activity level with funding sources, and is specified for the duration of the project period in a multi-year budget. Costs are supported with valid estimates using benchmarks from similar projects or activities. Cost implications from inflation and foreign exchange exposure have been estimated and incorporated in the budget.

2: The project's budget is at the activity level with funding sources, when possible, and is specified for the duration of the project in a multi-year budget. Costs are supported with valid estimates based on prevailing rates.

1: The project's budget is not specified at the activity level, and/or may not be captured in a multi-year budget.

Evidence

Please see chapter B,C, D of the project document respectively Financing/ Cost Information, Project Information and Rationale for GCF involvement.

17. Is the Country Office fully recovering the costs involved with project implementation?

3: The budget fully covers all direct project costs that are directly attributable to the project, including programme management and development effectiveness services related to strategic country programme planning, quality assurance, pipeline development, policy advocacy services, finance, procurement, human resources, administration, issuance of contracts, security, travel, assets, general services, information and communications based on full costing in accordance with prevailing UNDP policies (i.e., UPL, LPL.)

2. The budget covers significant direct project costs that are directly attributable to the project based on prevailing UNDP policies (i.e., UPL, LPL) as relevant.

1: The budget does not reimburse UNDP for direct project costs. UNDP is cross-subsidizing the project and the office should advocate for the inclusion of DPC in any project budget revisions.

Evidence	Management Response
Cost recovery conducted based on the GCF cost recovery principles agreed accredited agencies.	

Effective **Quality Rating: Exemplary**

18. Is the chosen implementation modality most appropriate? (select from options 1-3 that best reflects this project)

3: The required implementing partner assessments (capacity assessment, HACT micro assessment) have been conducted, and there is evidence that options for implementation modalities have been thoroughly considered. There is a strong justification for choosing the selected modality, based on the development context. (both must be true to select this option)

2: The required implementing partner assessments (capacity assessment, HACT micro assessment) have been conducted and the implementation modality chosen is consistent with the results of the assessments.

1: The required assessments have not been conducted, but there may be evidence that options for implementation modalities have been considered.

Evidence	Management Response
HACT analyses have been conducted for Municipality of Yerevan city and Environmental Project Implementation Unit of the Ministry of Nature Protection. Uploaded in "ProjectQA Documents" library.	

19. Have targeted groups, prioritizing marginalized and excluded populations that will be affected by the project, been engaged in the design of the project in a way that addresses any underlying causes of exclusion and discrimination?

3: Credible evidence that all targeted groups, prioritising marginalized and excluded populations that will be involved in or affected by the project, have been actively engaged in the design of the project. Their views, rights and any constraints have been analysed and incorporated into the root cause analysis of the theory of change which seeks to address any underlying causes of exclusion and discrimination and the selection of project interventions.

2: Some evidence that key targeted groups, prioritising marginalized and excluded populations that will be involved in the project, have been engaged in the design of the project. Some evidence that their views, rights and any constraints have been analysed and incorporated into the root cause analysis of the theory of change and the selection of project interventions.

1: No evidence of engagement with marginalized and excluded populations that will be involved in the project during project design. No evidence that the views, rights and constraints of populations have been incorporated into the project.

Not Applicable

Evidence
Chapter A4 of the project document refers to the energy poverty. Component 4 of the project document envisages $14 million investment offers as a temporary targeted incentive to mitigate participation of energy poor in the project activities.

20. Does the project conduct regular monitoring activities, have explicit plans for evaluation, and include other lesson learning (e.g. through After Action Reviews or Lessons Learned Workshops), timed to inform course corrections if needed during project implementation?

Yes

No

Evidence
please see section H of the project document

21. The gender marker for all project outputs are scored at GEN2 or GEN3, indicating that gender has been fully mainstreamed into all project outputs at a minimum.

Yes

No

Evidence	Management Response
Please see chapter E of the project document. E.3.1. Environmental, social and economic co-benefits, including gender-sensitive development impact	

22. Is there a realistic multi-year work plan and budget to ensure outputs are delivered on time and within allotted resources? (select from options 1-3 that best reflects this project)

3: The project has a realistic work plan & budget covering the duration of the project at the activity level to ensure outputs are delivered on time and within the allotted resources.

2: The project has a work plan & budget covering the duration of the project at the output level.

1: The project does not yet have a work plan & budget covering the duration of the project.

Evidence
Please see budget of the project document

Sustainability & National Ownership **Quality Rating: Highly Satisfactory**

23. Have national partners led, or proactively engaged in, the design of the project?

- *3: National partners have full ownership of the project and led the process of the development of the project jointly with UNDP.*
- 2: The project has been developed by UNDP in close consultation with national partners.
- 1: The project has been developed by UNDP with limited or no engagement with national partners.
- Not Applicable

Evidence

GCF National Designated authority - Ministry of Nature protection provided non objection letter - attached to the project document.

24. Are key institutions and systems identified, and is there a strategy for strengthening specific/ comprehensive capacities based on capacity assessments conducted? (select from options 0-4 that best reflects this project):

- 3: The project has a comprehensive strategy for strengthening specific capacities of national institutions based on a systematic and detailed capacity assessment that has been completed. This strategy includes an approach to regularly monitor national capacities using clear indicators and rigorous methods of data collection, and adjust the strategy to strengthen national capacities accordingly.
- 2.5: A capacity assessment has been completed. The project document has identified activities that will be undertaken to strengthen capacity of national institutions, but these activities are not part of a comprehensive strategy to monitor and strengthen national capacities.
- *2: A capacity assessment is planned after the start of the project. There are plans to develop a strategy to strengthen specific capacities of national institutions based on the results of the capacity assessment.*
- 1.5: There is mention in the project document of capacities of national institutions to be strengthened through the project, but no capacity assessments or specific strategy development are planned.
- 1: Capacity assessments have not been carried out and are not foreseen. There is no strategy for strengthening specific capacities of national institutions.
- Not Applicable

Evidence

please see chapter C (Project Information) of the project document

25. Is there is a clear strategy embedded in the project specifying how the project will use national systems (i.e., procurement, monitoring, evaluations, etc.,) to the extent possible?

- *Yes*
- No
- Not Applicable

Evidence

The project M&E plan has special provisions for evaluation of the project progress and meeting the stataed objectives

26. Is there a clear transition arrangement/ phase-out plan developed with key stakeholders in order to sustain or scale up results (including resource mobilisation strategy)?

- *Yes*
- No

Evidence

The project objective is reduction of risks for attractivness of investmenst in energy effciency thus insuring sustainable schemes for involvement finanacial institutions in that activities

Quality Assurance Summary/PAC Comments

Annex 14. UNDP Risk Log

OFFLINE UNDP RISK LOG

#	Description	Date Identified	Type	Impact & Probability	Countermeasures / Mngt response	Owner	Submitted, updated by	Last Up-date	Status
1.	Government does not commit to refine and implement new building legislation		Regulatory	Legislation is recently renewed, the economic and enforcement instruments are insufficient P = 3 I = 2	This risk is mitigated through UNDP's established working relationship with the Government to develop laws and building codes	Imple-menting partner UNDP			
2.	Knowledge and skills among local professionals are too low to support the growth of the market		Institutional	P = 3 I = 3	This risk will be mitigated through provision of technical assistance to build the capacities of various local stakeholders involved in building design, construction and operation under Component 4. Thus, technical assistance will be provided, in particular, through a 'learning-by-doing' approach, whereby local specialists will work together with international consultants.	UNDP PMT			
3.	IP in the Ministry of Natural Protection as well as the Municipality of Yerevan do not have formal written policies and procedures on different processes and functions.		Organizational	Absence of worked-out policies and procedures in IPs can impact the following required processes: procurement, M&E, anti-fraud	The Project will address the IPs procedural deficiencies through assistance in drafting and adoption of written policies and procedures on key processes and functions and properly communicating it.	Imple-menting partner UNDP PMT			

#	Description	Date Identified	Type	Impact & Probability	Countermeasures / Mngt response	Owner	Submitted, updated by	Last Up-date	Status
				and corruption, contracts management, accounting, internal control framework. P = 4 I = 2					
4.	Accounting entries and general ledger of overall activities of IPs are not maintained in appropriate accounting software. Instead, the record keeping of expenditures and funds of each project are maintained in separate Excel files.		Operational	P = 3 I = 2	Recommendations and assistance will be provided to implement appropriate accounting system to allow proper recording financial transactions of the IP, and general ledger for the whole activity of the IP.	Imple-menting partner UNDP PMT			
5.	IPs do not have formal methodology on cost allocation to the various funding sources and invoicing in accordance with the account code of the project served.		Operational	P = 3 I = 2	Recommendation will be provided for developing cost allocation methodology to ensure that expenses are accurately charged to different projects and invoices are marked with the appropriate project codes.	Imple-menting partner UNDP			
6.	EPIU in the Ministry of Natural Protection IP does not have formal procedure defining mandatory financial reporting and its frequency.		Organizational	P = 2 I = 2	Formal procedure on financial reporting will be adopted to specify the report type, content, the source system for key reports, the frequency of preparation	Imple-menting partner			
7.	Yerevan Municipality IP's internal audit function is not independent from the IP's		Organizational	P = 4 I = 2	The project will propose to Yerevan Municipality to amend its organizational structure so	Yerevan Munici-pality			

#	Description	Date Identified	Type	Impact & Probability	Countermeasures / Mngt response	Owner	Submitted, updated by	Last Up-date	Status
	management and is accountable to the Mayor				that the internal audit function is accountable to the governing body (i.e. Council).				
8.	Yerevan Municipality IP's internal audit activities financed by the agencies are not included in the internal audit work programme		Operational	P = 2 I = 2	The project will propose to Yerevan Municipality to add audits of the particular projects activities to the annual audit internal work plan.	Yerevan Munici-pality			
9.	EPIU in the Ministry of Natural Protection IP does not have procedures in place for allocating staff time to different projects.		Organizational	P = 2 I = 2	The project will propose to EPIU to prepare detailed timesheets which will allow checking the staff time allocation to different projects.	Imple-menting Partner			
10.	EPIU in the Ministry of Natural Protection IP accounting staff lacked the training to work with international organizations.		Institutional	The lack of experience increases the risk of deficient financial reporting. P = 3 I = 3	Provide these staff with appropriate training				
11.	Yerevan Municipality IP's inventory is not centralized, while subsidiary asset ledgers are not maintained in the accounting software.		Organizational	Yerevan Municipality in the past conducted the inventory of its assets decentralized. Verifications initiated in 2016 after massive re-organization (six administrative districts were combined with the Municipality) are not finalized yet.	The project will propose to Yerevan Municipality: i. to develop the adequate inventory procedures and to build capacity for conducting inventory, and ii. to establish other controls over the tangible assets such as assigned responsible persons to particular assets, set up subsidiary ledgers for assets in accounting software, etc.	Yerevan Munici-pality			

#	Description	Date Identified	Type	Impact & Probability	Countermeasures / Mngt response	Owner	Submitted, updated by	Last Up-date	Status
				P = 3 I = 3					
12.	Lack of interest to finance/co-finance energy efficiency retrofits in building sector		Financial	Limited scope of financial market and its weak connection with potential stakeholders in building sector P = 4 I = 4	De-risking component of the project, supported by temporary incentives component, are expected to mitigate risk associated with any potential lack of interest.	Imple-menting Partner UNDP PMT			
13.	Possible default on loans provided to the residential sector		Financial	P = 2 I = 2	Promote safeguarding instruments for those involved.	Imple-menting Partner UNDP PMT			
14.	Lenders remain unwilling to provide loans for energy efficiency investments		Financial	P = 3 I = 2	While this project will not be able to eliminate macroeconomic risk, the financial mechanisms to be supported will provide lenders with ample learning opportunities. Experience in other countries shows that this learning, when accompanied by technical assistance to address systemic barriers, leads to sustained lending since lenders and borrowers will be shown the benefits of energy efficiency investments.	Imple-menting Partner UNDP PMT			

#	Description	Date Identified	Type	Impact & Probability	Countermeasures / Mngt response	Owner	Submitted, updated by	Last Up-date	Status
15.	Lack of developed ESCO market prevents achievement of reductions of energy intensity in public buildings		Financial/Organiza-tional	P = 3 I = 3	Armenia has a number of quasi-ESCO companies, but their operations have, to date, been limited to the public sector only, and there are deficiencies in the regulations regarding performance-based contracting models with the public and residential building sub-sectors, which pose a risk. The gradual introduction of performance-based contracts and associated policy changes, combined with capacity building, will help to mitigate this risk.	Imple-menting Partner UNDP PMT			
16.	Retrofit works and failure of structural elements from building retrofits may pose safety risks to communities		Other (Social)	P = 1 I = 1	Only registered contractor(s) will be allowed to undertake energy efficiency building retrofits. Contractor(s) will be required to conduct orientation and training for workers on energy efficiency building retrofits, particularly multi-family apartment buildings and public buildings.	Imple-menting Partner UNDP PMT			
17.	Municipalities do not have the capacity to collect baseline data for the EMIS and to manage energy efficiency building retrofit financing projects		Institutional	Deficient data, management system and low human capacity endanger proper MRV system P = 2 I = 3	Component 1 will include capacity building on establishing MRV, data collection and analysis, and procurement / installation of EMIS. Component 2 will support broader legislative reforms to develop building codes, energy auditing, energy certification and labelling for existing buildings, multi-owner	Yerevan Munici-pality UNDP PMT			

#	Description	Date Identified	Type	Impact & Probability	Countermeasures / Mngt response	Owner	Submitted, updated by	Last Up-date	Status
					building management, payment enforcement, and the framework for energy efficiency retrofits which will contribute significantly to build the necessary capacity.				
18.	Potential for excluding affected stakeholders from participation		Political	P = 1 I = 3	Consultations have been undertaken to determine the stakeholders and their roles during project implementation. These consultations will continue throughout the project cycle. Consultations on various components of the project will be designed to be gender-sensitive, inclusive and responsive to the needs of the stakeholders identified. A mechanism to deal with potential conflict issues during implementation is incorporated in the project design and contracts for commercial firms (e.g. architects etc.) will be through public procurement according to UNDP rules.	Imple-menting Partner Yerevan Munici-pality UNDP PMT			
19.	Inadequate project implementation and coordination with other initiatives		Strategic	Ineffective efforts in the fields due to lack of cooperation, overlap of functions. P = 2 I = 2	In particular, for design and implementation of demonstration projects, implementation time-frame and coordination with other partners and providers of co-financing is critical. UNDP Armenia has experience with implementing similarly complex projects for construction of demonstration	Imple-menting Partner Yerevan Munici-pality UNDP			

#	Description	Date Identified	Type	Impact & Probability	Countermeasures / Mngt response	Owner	Submitted, updated by	Last Up-date	Status
					EE buildings and urban lighting projects; the same model and institutional arrangement for procurement will be adopted for these retrofits.	PMT			

Annex 15. Results of capacity assessment of project implementing partner and HACT micro assessment

The project will be implemented following the National Implementation Modality (NIM). National implementation is used when there is adequate capacity in the national authorities to undertake the functions and activities of the project. UNDP ascertained the national capacity of both the implementing partners by undertaking evaluations of capacity following the Framework for Cash Transfers to Implementing Partners (part of the Harmonised Approach to Cash Transfers - HACT):

- State Agency “Environmental project implementation unit” at the Ministry of Nature Protection of the Republic of Armenia
- Yerevan Municipality

Findings and recommendations are provided in both documents. They will be used as the basis for providing capacity support from UNDP during project implementation.

The implementing partner may follow its own procedures provided they conform to the UNDP Financial Regulations and Rules and Principles (see full details available at https://info.undp.org/global/popp/ppm/Pages/Legal-Framework.aspx). The implementing partner may alternatively apply UNDP practices.

The UNDP country office may mobilise certain inputs on behalf of the implementing partner. In this case, UNDP establishes the contracts following UNDP rules and procedures, as well as the policies for country office support services. UNDP is then a Responsible Party for the provision of support services. Inputs are the personnel, goods, services and micro-capital grants that are necessary and sufficient to produce the planned outputs. Inputs are obtained on the basis of the project work plan and the corresponding budget. Where the progress towards planned outputs is not advancing as expected, the Project Board shall review the strategy of the project, including the work plan, budget and inputs.

http://www.nature-ic.am/en/publication/Harmonized-Approach-to-Cash-Transfer/9489

Annex 16. Technical, economic and financial analysis

A detailed bottom-up analysis of model buildings in Armenia is presented below. Four models have been developed, two in the residential sector and two in the public sector.

An issue that is relevant to all four models is the choice of discount rate in the calculation of the NPV. The choice of discount rate should be informed by considering which party is being affected and what the time value of money is for that party[114]. The time value of money for a household will vary considerably according to household members' perception of risk and the perception of likelihood of returns on the investment. There is a difference in investment in energy efficiency in the residential sector between individual households and multi-owner buildings. Investments at the household level have been shown to be attractive to a small number of households in other countries at low amounts per investment – especially when subsidies help to trigger awareness and catalyse action. However, current investments in energy efficiency in Armenia at the building level in multi-owner buildings are negligible. This is partly related to legal and administrative barriers but, in some countries where these barriers are not significant, collective decision-making to invest in energy efficiency actions still does not take place. This can be due to – for example – lack of awareness amongst the owners, lack of access to financing, inertia in the decision-making process, perceptions that the building space outside of the apartment is not the owner's individual responsibility, coordination costs, absentee owners, the risk of free riders, etc. This indicates that there should be a difference in the appropriate discount rate to be used in any financial modelling. The justification for using the particular discount rates selected are described below:

- **For households (houses and dwellings within apartment buildings)**, the discount rate represents the opportunity cost of other investing options. As a proxy for this opportunity cost, the interest rate on savings deposits in Armenia is used (10.4% in 2014).[115] The discount rate used in calculations is 10%.
- **For building-level investments**, the discount rate chosen is 17.5%:
  - For building-level investments, the perception of risk is higher and the perception of likelihood of returns on the investment is lower. This is generally due to the perception that collective action may not succeed. Additionally, there is general inertia of apartment owners to invest together. This is demonstrated by the lack of investment at the apartment-building level in countries where the legal framework is already conducive to collective decision-making (for example, Croatia, Serbia and Montenegro).

  - This figure is consistent with that given in the EU analysis, "Study evaluating the current energy efficiency policy framework in the EU and providing orientation on policy options for realising the cost-effective energy efficiency/saving potential until 2020 and beyond", which uses 17.5%. This figure is also consistent with that used in the EU's PRIMES model for households[116]. While, clearly, perceptions of risk are far higher in Armenia than in the EU (as reflected by high interest rates on savings accounts, loans, etc.), this conservative figure has been used in the analysis.

D.1 Residential sector buildings

Two models have been developed, one for an individual single-family house, representing about 95 million square metres of living space in Armenia, and one for a multi-family apartment building, representing about 300,000 square metres of living space.

D.1.1 Single-family house

Technical analysis

The technical parameters used in the analysis are as follows:

[114] See discussions in, for example Woolf et al. (2012) Best Practices in Energy Efficiency Programme Screening: How to Ensure that the Value of Energy Efficiency is Properly Accounted For. Available at http://www.synapse-energy.com/sites/default/files/SynapseReport.2012-07.NHPC_.EE-Program-Screening.12-040.pdf

[115] See World Bank (2015) Data: Deposit interest rate (%) http://data.worldbank.org/indicator/FR.INR.DPST/countries

[116] See page 87 of this report:

https://ec.europa.eu/energy/sites/ener/files/documents/2014_report_2020-2030_eu_policy_framework.pdf

Building parameters		
Country		Armenia
City		Yerevan
Elevation	m	989
Heating degree days	Degree days (K.d)	2,660
Length of building	m	10.0
Width of building	m	8.0
# of floors	#	1
Height of building	m	3
Area of building	m^2	80
Area of building envelope (excl. roof)	m^2	108
Area of building envelope bordering another building	m^2	0
Area of building envelope - windows	m^2	10
Area of entrance door	m^2	2.0
Area of building envelope - outer wall	m^2	96
Floor area of the building	m^2	80
Area of roof	m^2	80
Number of rooms + kitchen per dwelling	p#	4
Floor area per dwelling	m^2	80.0

Energy characteristics			
Characteristic	Unit	Before	After
Type of heating	Type	Own boiler / stove	Own boiler / stove
Boiler/stove efficiency	%	90%	90%
Fuel used - heating		Natural gas	Natural gas
Fuel price	$/kWh	$ 0.0353	$ 0.0353
CO_2 coefficient	(kg/MWh)	247	247
Demand – Domestic Hot Water	kWh/m^2	20	20
Type of DHW source	Type	Own boiler / stove	Own boiler / stove
Boiler/stove efficiency	%	90%	90%
Fuel used - DHW		Natural gas	Natural gas
Fuel price - DHW	$/kWh	$ 0.0353	$ 0.0353
CO_2 coefficient - DHW	(kg/MWh)	247	247
Other electricity demand	kWh/m^2	30	30

A basic set of efficiency measures are applied, namely thermal cladding of outer walls, window replacement, roof insulation, and the use of thermostatic valves with hydraulic balancing. The technical parameters are as follows:

		Costs					Energy characteristics		
		Per unit cost		Units per building	Cost per building	Cost per dwelling	Unit	Before	After
EE outer walls	m^2	$ 45	$/m^2$	96	$4,320	$4,320	U (W/m^2K)	2.5	0.75
EE windows	m^2	$ 165	$/m2	10	$1,650	$1,650	U (W/m^2K)	4	2
Roof insulation	m^2	$ 55	$/m2	80	$4,400	$4,400	U (W/m^2K)	2	0.25
Thermostatic valves	Pieces	$ 30	$/pc	4					
Hydraulic balance valves	Pieces	$ 70	$/pc	2					

Calculated energy needs and potential savings for these measures are calculated for each measure. A simple payback is calculated for each measure. From the table below, clearly the wall, roof and heating control measures have the shortest payback periods.

	Energy needs/fuel needs (kWh)						Potential Savings			
	Energy used before	Fuel used before	Fuel cost before	Energy used after	Fuel used after	Fuel cost after	Energy (kWh/ year)	Fuel (kWh/ year)	$/year	Simple payback (years)
EE outer walls	15,552	17,280	$ 610	4,666	5,184	$ 183	10,886	12,096	$ 427	10.1
EE windows	2,592	2,880	$ 102	1,296	1,440	$ 51	1,296	1,440	$ 51	32.4
Roof improvement	10,368	11,520	$ 407	1,296	1,440	$ 51	9,072	10,080	$ 356	12.4
Thermostatic valves										
Hydraulic balance valves										

Considering the overall investment parameters, these are as follows:

	Investment parameters			
	Investment ($)	Energy savings (kWh/ year)	Fuel savings (kWh/year)	Savings ($/year)
EE outer walls	$ 4,320	10,886	12,096	$ 427
EE windows	$ 1,650	1,296	1,440	$ 51
Roof improvement	$ 4,400	9,072	10,080	$ 356
Thermostatic valves				
Hydraulic balance valves				
Total	$ 10,630	21,980	24,422	$ 860

Overall, for the 4 measures considered, there is a theoretical savings potential of 77%. Assuming a rebound effect of 20% of the savings,[117] it is estimated that, in practice, energy savings will be 62%. The calculated savings are summarised below:

Calculated consumption							
	Unit	Before	After	Theoretical Savings	After rebound effect	Savings	Savings (%)
Energy consumption per building - heating	kWh/year	28,512	6,532	21,980	10,928	17,584	62%
Fuel consumption per building - heating	kWh/year	31,680	7,258	24,422	12,142	19,538	62%
Energy costs per building - heating	$/year	$ 1,119	$ 256	$ 862	429	$ 690	62%
Specific energy consumption - heating	kWh/m^2	356	82	275	137	220	62%
Energy consumption per dwelling - heating	kWh/year	28,512	6,532	21,980	10,928	17,584	62%
Fuel consumption per dwelling - heating	kWh/year	31,680	7,258	24,422	12,142	19,538	62%
Energy costs per dwelling - heating	$/year	$ 1,119	$ 256	$ 862	$ 429	$ 690	62%

[117] For justification of this level of rebound effect, see for example, Nadel (2012), *White Paper: The Rebound Effect: Large or Small?* http://aceee.org/white-paper/rebound-effect-large-or-small

Financial and economic analysis

Using the technical analysis above, an economic and financial assessment has been carried out. The results are given in the tables below:

Financial/ Economic Analysis – per building			Year after realisation															
			0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
Price change (heat)	%		0%	1%	1%	1%	1%	1%	1%	1%	1%	1%	1%	1%	1%	1%	1%	1%
Fuel/heat price	($/ MWh)		35.3	35.7	36.0	36.4	36.7	37.1	37.5	37.9	38.2	38.6	39.0	39.4	39.8	40.2	40.6	41.0
Total % increase	%		0%	1%	2%	2%	3%	4%	5%	6%	7%	8%	9%	10%	12%	13%	14%	15%
Price change (DHW)	%		0%	1%	1%	1%	1%	1%	1%	1%	1%	1%	1%	1%	1%	1%	1%	1%
Fuel/heat price	($/ MWh)		35.3	35.7	36.0	36.4	36.7	37.1	37.5	37.9	38.2	38.6	39.0	39.4	39.8	40.2	40.6	41.0
Total % increase	%		0%	1%	2%	2%	3%	4%	5%	6%	7%	8%	9%	10%	12%	13%	14%	15%

Investment parameters		Total																
Total investment cost	10,630		0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
Own funds	10%	1,063	1,063															
Grant	9%	957	957															
Loan	81%	8,610	8,610															
Total investment cost		10,630	10,630															
Non-grant investment	($ p.a)	9,673	9,673															

Income/ Savings (grant-dependent)																		
Yearly - heat	($ p.a)	11,106		690	697	704	711	718	725	732	740	747	755	762	770	777	785	793
Yearly - DHW	($ p.a)	0		0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Property value increase	($ p.a)	2,000		133	133	133	133	133	133	133	133	133	133	133	133	133	133	133
GHG reduction value	($ p.a)	1,810		121	121	121	121	121	121	121	121	121	121	121	121	121	121	121
Simple payback and IRR																		
Cash flow	($)	1,434	-9,673	690	697	704	711	718	725	732	740	747	755	762	770	778	785	793
Cumulative Cash Flow	($)		-9,673	-8,983	-8,286	-7,583	-6,872	-6,154	-5,428	-4,696	-3,956	-3,209	-2,454	-1,692	-922	-145	640	1,434
Simple Payback Period	Months	158		12.0	12.0	12.0	12.0	12.0	12.0	12.0	12.0	12.0	12.0	12.0	12.0	12.0	2.2	0.0
Financial IRR	(%)	1.7%																
Discount rate	(%)	10.0%	Standard discount rate described in discussions															
NPV	($)	-3,761																
Economic value	($)	4,287	-10,630	944	951	958	965	972	979	986	994	1,001	1,009	1,016	1,024	1,031	1,039	1,047
Economic IRR	(%)	4.5%																

The economic analysis takes into account increasing fuel prices, an increase in property values, and an economic benefit of reduced GHG emissions valued at $25 per tonne of CO_2eq reduced.[118]

With a 9% grant, there is a simple payback of 12 years, a financial IRR of 1.7% and an economic IRR of 4.5%. Clearly, the NPV is negative.

Financial analysis with leveraged investments:
An illustrative loan calculation is shown below using a sample loan for a household for a term of 6 years with a 13% interest rate and 2% bank fees.[119] Because of the high interest rates on loans in Armenia, the net present value of a leveraged investment is actually lower than that of a non-leveraged investment. However, positive experience in other countries (e.g. Serbia, Kosovo and Albania) where financial conditions for loans are similar indicate that lending will likely still occur with relatively small incentive schemes due to the lack of household capital for making home improvements / energy efficiency investments. Households do not commonly use a financial calculation to justify home renovation. Through a modest incentive, they can be encouraged to choose higher-efficiency options.

Loan calculation per household													
Maturity period	**year**	**6**											
Credit interest rate	**%**	**13.0%**	**Year after realisation**										
Bank fees	**%**	**2.0%**	**0**	**1**	**2**	**3**	**4**	**5**	**6**	**7**	**8**	**9**	**10**
Balance brought forward	**($)**		0	7,727	6,535	5,187	3,665	1,944	0	0	0	0	0
Drawdown	**($)**	8,610	8,610										
Bank fees	**($)**	172	172										
Principal repayment	**($)**	-8,783	-1,055	-1,192	-1,347	-1,523	-1,721	-1,944	0	0	0	0	0
Interest repayment	**($)**	-4,399	-1,142	-1,005	-850	-674	-476	-253	0	0	0	0	0
Total debt service	**($)**	**-13,182**	**-2,197**	**-2,197**	**-2,197**	**-2,197**	**-2,197**	**-2,197**	**0**	**0**	**0**	**0**	**0**
Balance carried forward	**($)**		**7,727**	**6,535**	**5,187**	**3,665**	**1,944**	**0**	**0**	**0**	**0**	**0**	**0**
Cash flow for the building	**($)**	-3,138	-3,260	-1,507	-1,500	-1,493	-1,486	-1,479	725	732	740	747	755
Cumulative cash flow for the building	**($)**		-3,260	-4,767	-6,267	-7,760	-9,246	-10,725	-10,000	-9,267	-8,528	-7,781	-7,026
Payback period	**Months**	**180.0**	0.0	12.0	12.0	12.0	12.0	12.0	12.0	12.0	12.0	12.0	12.0
Leveraged IRR	**(%)**	**-3.9%**											

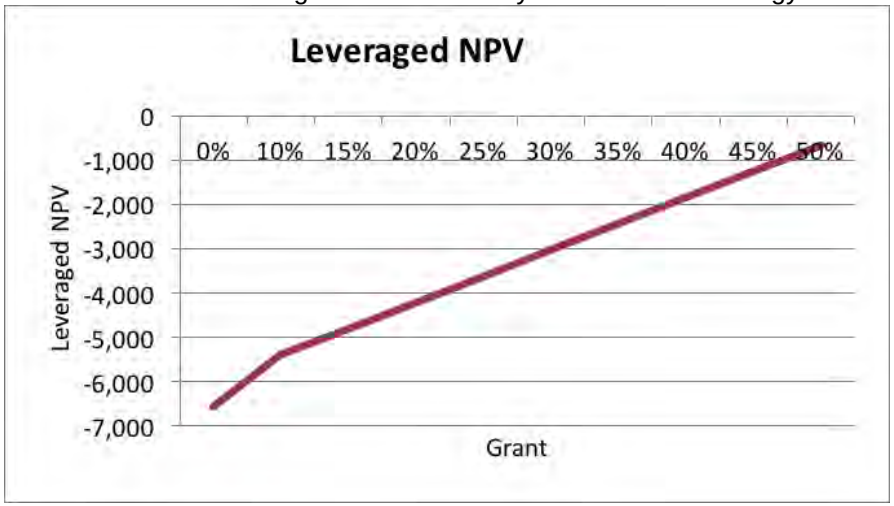
[118] This value is within the lower end of the range of estimations used by the U.S. Environmental Protection Agency for the Social Cost of CO_2 for 2015 which were (in 2011 Dollars) US$ 12 per tonne using a 5% average discount rate, US$ 39 per tonne using a 3% average discount rate and US$ 61 per tonne using a 2.5% average discount rate: http://www.epa.gov/climatechange/EPAactivities/economics/scc.html

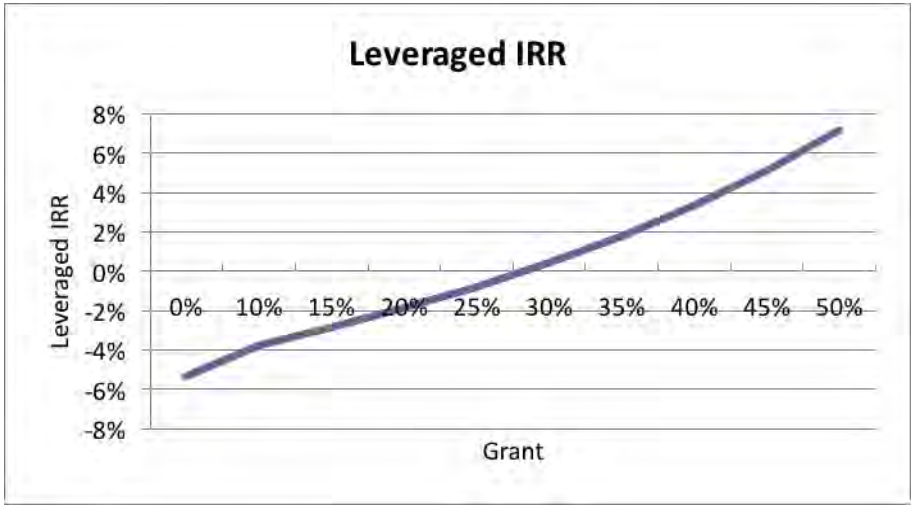
[119] See, for example, the loan conditions at HSBC in Armenia for housing renovations: https://www.hsbc.am/1/2/am/en/personal/loans/mortgage/renovation-usd for similar terms.

Leveraged NPV	**($)**	**-5,502**

	1	2	3	4	5	6	7	8	9	10
Monthly credit repayment (total)	$183.08	$183.08	$183.08	$183.08	$183.08	$183.08	$0.00	$0.00	$0.00	$0.00
Monthly credit repayment per household	$183.08	$183.08	$183.08	$183.08	$183.08	$183.08	$0.00	$0.00	$0.00	$0.00
Monthly saving per household	$57.50	$58.08	$58.66	$59.24	$59.83	$60.43	$61.04	$61.65	$62.26	$62.89
Efficiency of payments ($saving/$payment)	0.31	0.32	0.32	0.32	0.33	0.33				
Household income at median level	$ 400.00									
Monthly credit as a percentage of income	39.6%									

A sensitivity analysis has been carried out by varying the amount of the grant. The leveraged NPV and IRR are shown in the figures below. They indicate that the leveraged IRR increases to 0 with a 25-30% grant but that the NPV is still below 0 even with a 50% grant. However, success stories in similar markets show that small incentives such as 10-20% grants can stimulate the market for energy efficiency improvements[120] – indicating that the decision regarding investment and loan-taking is not made solely on the basis of energy saved.





Additional sensitivity analysis was undertaken for two other variables as follows:

1. **Costs of investment**
2. **Savings value**

[120] See for instance: http://iet.jrc.ec.europa.eu/energyefficiency/sites/energyefficiency/files/final_report_on_financing_ee_in_buildings.pdf

Both of these variables are increased and decreased by up to 20%, with the following results on the leveraged IRR from the base case of -3.9%, with a baseline grant level of 9%:

Investment cost	Savings								
	-20%	-15%	-10%	-5%	0%	5%	10%	15%	20%
-20%	-4%	-3%	-2%	-1%	0%	0%	1%	2%	3%
-15%	-5%	-4%	-3%	-2%	-1%	-1%	0%	1%	2%
-10%	-6%	-5%	-4%	-3%	-2%	-2%	-1%	0%	1%
-5%	-6%	-6%	-5%	-4%	-3%	-2%	-2%	-1%	0%
0	-7%	-6%	-5%	-5%	-4%	-3%	-2%	-2%	-1%
5%	-8%	-7%	-6%	-5%	-5%	-4%	-3%	-3%	-2%
10%	-8%	-8%	-7%	-6%	-5%	-5%	-4%	-3%	-3%
15%	-9%	-8%	-7%	-7%	-6%	-5%	-5%	-4%	-3%
20%	-9%	-9%	-8%	-7%	-7%	-6%	-5%	-5%	-4%

The results show that the investment cost and the savings jointly contribute to the financial performance. Clearly, with 20% higher savings and 20% lower investment cost, the IRR is positive (3%). However, as observed above, households usually do not make their investment decisions based on IRR and NPV.

D.1.2 Multi-family apartment building

Technical analysis

The technical parameters used in the analysis of a model multi-family apartment building are as follows:

Building parameters		
Country		Armenia
City		Yerevan
Elevation	m	989
Heating degree days	Degree days (K.d)	2,700
Length of building	M	20.0
Width of building	m	15.5
# of floors	#	9
Height of building	m	27
Area of building	m^2	310
Area of building envelope (excl. roof)	m^2	1,917
Area of building envelope bordering another building	m^2	0
Area of building envelope - windows	m^2	180
Area of entrance door	m^2	3.0
Area of building envelope - outer wall	m^2	1,734

Floor area of the building	m^2	2,790
Area of roof	m^2	310
Number of dwellings		36
Number of rooms + kitchen per dwelling	#	5
Floor area - unheated	m^2	90.0
Floor area per dwelling	m^2	75.0
Windows and Doors in staircase and landing areas	m^2	57.0

Energy characteristics			
Characteristic	Unit	Before	After
Type of heating	Type	Own boiler/stove	Own boiler/stove
Boiler/stove efficiency	%	90%	90%
Fuel used - heating		Natural gas	Natural gas
Fuel price	$/kWh	$ 0.0353	$ 0.0353
CO_2 coefficient	(kg/MWh)	247	247
Demand - DHW	kWh/m^2	20	20
Type of DHW source	Type	Own boiler/stove	Own boiler/stove
Boiler/stove efficiency	%	90%	90%
Fuel used - DHW		Natural gas	Natural gas
Fuel price - DHW	$/kWh	$ 0.0353	$ 0.0353
CO_2 coefficient - DHW	(kg/MWh)	247	247
Other electricity demand	kWh/m^2	30	30

A basic set of efficiency measures is applied, namely thermal cladding of outer walls, window replacement, roof insulation, and the use of thermostatic valves with hydraulic balancing. The technical parameters are as follows:

		Costs					Energy characteristics		
		Per unit cost		Units per building	Cost per building	Cost per dwelling	Unit	Before	After
EE outer walls	m^2	$40	$/m^2$	1,734	$ 69,360	$ 1,927	U (W/m^2K)	3.2	0.75
EE windows	m^2	$150	$/m2	180	$ 27,000	$ 750	U (W/m^2K)	5.5	2
Roof insulation	m^2	$50	$/m2	310	$ 15,500	$ 431	U (W/m^2K)	2	0.25
Windows and doors installation in staircase and landing areas	m^2	$85	$/pc	57	$ 4,845	$ 135	U (W/m^2K)	8.0	2.1

Calculated energy needs, potential savings and simple payback are calculated for each measure. From the table below, clearly the wall, roof and heating control measures have the shortest payback periods.

	Energy needs/fuel needs (kWh)						Potential Savings			
	Energy used before	Fuel used before	Fuel cost before	Energy used after	Fuel used after	Fuel cost after	Energy (kWh/ year)	Fuel (kWh/ year)	$/year	Simple payback (years)
EE outer walls	359,562	399,514	$ 14,108	84,272	93,636	$ 3,307	275,290	305,878	$ 10,802	6.4
EE windows	64,152	71,280	$ 2,517	23,328	25,920	$ 915	40,824	45,360	$ 1,602	16.9
Roof improvement	40,176	44,640	$ 1,576	5,022	5,580	$ 197	35,154	39,060	$ 1,379	11.2
Windows and doors installation in staircase and landing areas	29,549	32,832	$ 1,159	7,695	8,550	$ 302	21,854	24,282	$ 857	5.7

Considering the overall investment parameters, these are as follows:

	Investment parameters			
	Investment ($)	Energy savings (kWh/ year)	Fuel savings (kWh/year)	Savings ($/year)
EE outer walls	$ 69,360	275,290	305,878	$ 10,802
EE windows	$ 27,000	40,824	45,360	$ 1,602
Roof improvement	$ 15,500	35,154	39,060	$ 1,379
Windows and doors installation in staircase and landing areas	$ 4,845	21,854	24,282	$ 857
Totals	$ 116,705	373,122	414,580	$ 14,641

Overall for the 4 measures considered, there is a theoretical savings potential of 76%. Assuming a rebound effect of 20% of the savings, it is estimated that, in practice, energy savings will be 61%. The calculated savings are summarised below:

Calculated consumption							
	Unit	**Before**	**After**	**Theoretical Savings**	**After rebound effect**	**Savings**	**Savings (%)**
Energy consumption per building - heating	kWh/year	463,890	112,622	351,268	182,876	281,014	61%
Fuel consumption per building - heating	kWh/year	515,434	125,136	390,298	203,196	312,238	61%

Energy costs per building - heating	$/year	$ 18,202	$ 4,419	$ 13,783	7,176	$ 11,026	61%
Specific energy consumption - heating	kWh/m^2	172	42	130	68	104	61%
Energy consumption per dwelling - heating	kWh/year	12,886	3,128	9,757	5,080	7,806	61%
Fuel consumption per dwelling - heating	kWh/year	14,318	3,476	10,842	5,644	8,673	61%
Energy costs per dwelling - heating	$/year	$ 506	$ 123	$ 383	$ 199	$ 306	61%

Financial and economic analysis

Using the technical analysis above, an economic and financial assessment was carried out. The results are given in the tables below:

Financial and Economic Analysis – per building			**Year after realisation**														
			0	**1**	**2**	**3**	**4**	**5**	**6**	**7**	**8**	**9**	**10**	**11**	**12**	**13**	**14**	**15**
Price change (heat)	**%**		**0%**	**1%**	**1%**	**1%**	**1%**	**1%**	**1%**	**1%**	**1%**	**1%**	**1%**	**1%**	**1%**	**1%**	**1%**	**1%**
Fuel/heat price	**($/MWh)**		35.3	35.7	36.0	36.4	36.7	37.1	37.5	37.9	38.2	38.6	39.0	39.4	39.8	40.2	40.6	41.0
Total % increase	**%**		0%	1%	2%	2%	3%	4%	5%	6%	7%	8%	9%	10%	12%	13%	14%	15%
Price change (DHW)	**%**		**0%**	**1%**	**1%**	**1%**	**1%**	**1%**	**1%**	**1%**	**1%**	**1%**	**1%**	**1%**	**1%**	**1%**	**1%**	**1%**
Fuel/heat price	**($/MWh)**		35.3	35.7	36.0	36.4	36.7	37.1	37.5	37.9	38.2	38.6	39.0	39.4	39.8	40.2	40.6	41.0
Total % increase	**%**		0%	1%	2%	2%	3%	4%	5%	6%	7%	8%	9%	10%	12%	13%	14%	15%
Investment parameters		**Total**	**Year after realisation**															
Total investment cost	116,705		**0**	**1**	**2**	**3**	**4**	**5**	**6**	**7**	**8**	**9**	**10**	**11**	**12**	**13**	**14**	**15**
Own funds	**10%**	11,671	11,671															
Grant	**22%**	25,675	25,675															
Loan	**68%**	79,359	79,359															
Total investment cost		**116,705**	**116,705**															
Non-grant investment	**($ p.a)**	**91,030**	**91,030**															

Financial and Economic Analysis – per building			**Year after realisation**															
			0	**1**	**2**	**3**	**4**	**5**	**6**	**7**	**8**	**9**	**10**	**11**	**12**	**13**	**14**	**15**
Income / Savings (grant-dependent)																		
Yearly - heat	**($ p.a)**	**177,484**	11,026	11,026	11,136	11,248	11,360	11,474	11,588	11,704	11,821	11,940	12,059	12,180	12,301	12,424	12,549	12,674
Yearly - DHW	**($ p.a)**	**0**	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Property value increase	**($ p.a)**	**67,500**		4,500	4,500	4,500	4,500	4,500	4,500	4,500	4,500	4,500	4,500	4,500	4,500	4,500	4,500	4,500
GHG reduction value	**($ p.a)**	**28,920**		1,928	1,928	1,928	1,928	1,928	1,928	1,928	1,928	1,928	1,928	1,928	1,928	1,928	1,928	1,928
Simple payback and IRR																		
Cash flow	**($)**	**86,454**	-91,030	11,026	11,136	11,248	11,360	11,474	11,588	11,704	11,821	11,940	12,059	12,180	12,301	12,424	12,549	12,674
Cumulative Cash Flow	**($)**		**-91,030**	**-80,004**	**-68,868**	**-57,620**	**-46,260**	**-34,786**	**-23,198**	**-11,493**	**328**	**12,267**	**24,326**	**36,506**	**48,807**	**61,232**	**73,780**	**86,454**
Simple Payback Period	**Months**	**96**		**12.0**	**12.0**	**12.0**	**12.0**	**12.0**	**12.0**	**12.0**	**11.7**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**
Financial IRR	**(%)**	**9.5%**																
Discount rate	**(%)**	**17.5%**	See page 87 of this report: https://ec.europa.eu/energy/sites/ener/files/documents/2014_report_2020-2030_eu_policy_framework.pdf															
NPV	**($)**	**-26,477**																
Economic value	**($)**	**157,199**	-116,705	17,454	17,564	17,676	17,788	17,902	18,016	18,132	18,249	18,368	18,487	18,608	18,729	18,852	18,977	19,102
Economic IRR	**(%)**	**12.9%**																

The economic analysis takes into account increasing fuel prices, an increase in property values, and an economic benefit of reduced GHG emissions valued at $25 per tonne of CO_{2eq} reduced.

With a 22% grant, there is a simple payback of 8 years, a financial IRR of 9.5% and an economic IRR of 12.9%, and a negative NPV.

Financial analysis with leveraged investments

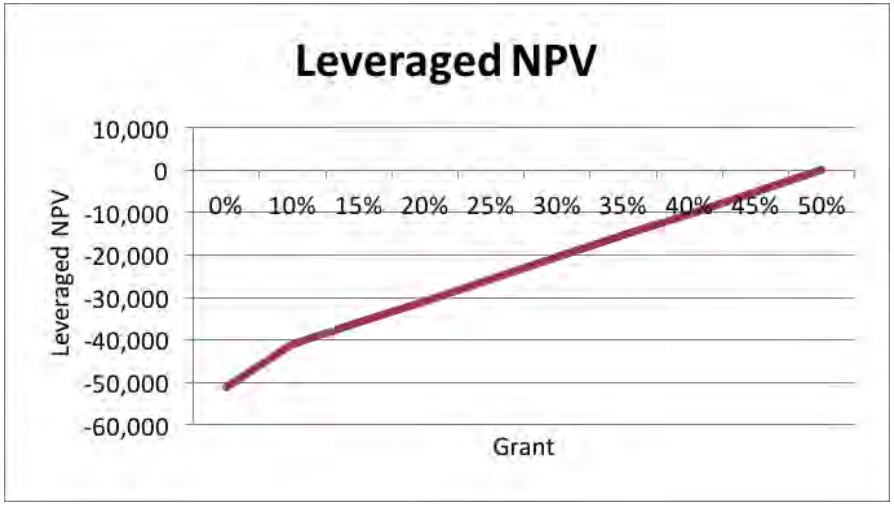
The loan calculation is shown below using a sample loan for a term of 6 years with a 15% interest rate and 2% bank fees[121]. Because of the high interest rates, the net present value of a leveraged investment is actually lower than that of a non-leveraged investment. However, experience in other countries (e.g. Ukraine, Russia) where financial conditions for loans are similar indicate that lending will likely still occur due to a lack of household capital for making building-level home improvements / energy efficiency investments. Clearly, households do not generally make their investment decisions regarding refurbishment based on financial analysis.

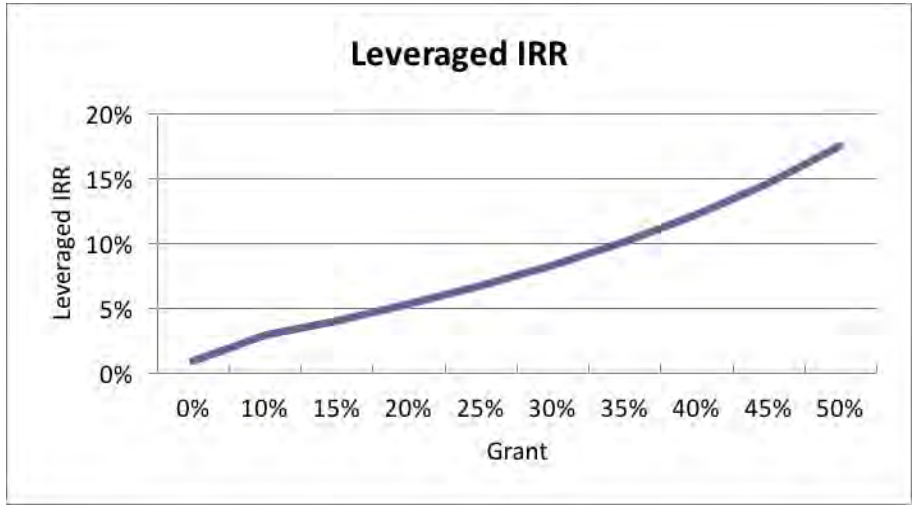
[121] The interest rate is slightly higher than that for a single family.

Loan calculation per building														
Maturity period	**year**	**6**												
Credit interest rate	**%**	**15.0%**	**Year after realisation**											
Bank fees	**%**	**2.0%**	**0**	**1**	**2**	**3**	**4**	**5**	**6**	**7**	**8**	**9**	**10**	**11**
Balance brought forward	**($)**		0	70,972	59,800	47,288	33,274	17,579	0	0	0	0	0	0
Drawdown	**($)**	79,359	79,359											
Bank fees	**($)**	1,587	1,587											
Principal repayment	**($)**	-80,947	-9,975	-11,172	-12,512	-14,014	-15,695	-17,579	0	0	0	0	0	0
Interest repayment	**($)**	-37,183	-9,714	-8,517	-7,176	-5,675	-3,993	-2,109	0	0	0	0	0	0
Total debt service	**($)**	**-118,130**	**-19,688**	**-19,688**	**-19,688**	**-19,688**	**-19,688**	**-19,688**	**0**	**0**	**0**	**0**	**0**	**0**
Balance carried forward	**($)**		**70,972**	**59,800**	**47,288**	**33,274**	**17,579**	**0**	**0**	**0**	**0**	**0**	**0**	**0**
Cash flow for the building	**($)**	47,684	-31,359	-8,662	-8,552	-8,441	-8,328	-8,215	11,588	11,704	11,821	11,940	12,059	12,180
Cumulative cash flow for the building	**($)**		-31,359	-40,021	-48,573	-57,014	-65,342	-73,557	-61,968	-50,264	-38,442	-26,503	-14,444	-2,264
Payback period	**Months**	**134.2**	0.0	12.0	12.0	12.0	12.0	12.0	12.0	12.0	12.0	12.0	12.0	12.0
Leveraged IRR	**(%)**	**5.9%**												
Leveraged NPV	**($)**	**-28,691**												
			1	2	3	4	5	6	7	8	9	10		
Monthly credit repayment (total)			$1,640.69	$1,640.69	$1,640.69	$1,640.69	$1,640.69	$1,640.69	$0.00	$0.00	$0.00	$0.00		
Monthly credit repayment per household			$45.57	$45.57	$45.57	$45.57	$45.57	$45.57	$0.00	$0.00	$0.00	$0.00		
Monthly saving per household			$25.52	$25.78	$26.04	$26.30	$26.56	$26.83	$27.09	$27.36	$27.64	$27.91		
Efficiency of payments ($saving/$payment)			0.56	0.57	0.57	0.58	0.58	0.59	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!		
Household income at median level			$ 400.00											
Monthly credit as a percentage of income			11.4%											

The analysis shows that loans are likely to be affordable to the majority of households, although for a sizeable proportion of households loans will represent a significant proportion of incomes. An incentive grant, disproportionally focused on those low-income households, will help to unlock building-level investments since these households can sometimes block building-level investment decisions in multi-apartment buildings.

A sensitivity analysis has been carried out by varying the amount of the grant. The leveraged NPV and IRR are shown in the figures below. They indicate that the leveraged IRR increases to 0 with a very low level of grant but that the NPV is still below 0 until the grant is approximately 50%. This is due to the combination of a high discount rate and high interest rates. However, success stories in similar markets show that incentives such as 20% grants can stimulate the market for energy efficiency improvements at the building level – indicating that the decision on investment and loan-taking is not made solely on the basis of energy saved.





Additional sensitivity analysis was undertaken for two other variables as follows:

1. **Costs of investment**
2. **Savings value**

Both these variables are increased and decreased by up to 20%, with the following results on the leveraged IRR from the base case of 5.9%, with a baseline grant level of 22%:

Investment cost	Savings								
	-20%	-15%	-10%	-5%	0%	5%	10%	15%	20%
-20%	6%	7%	8%	10%	11%	12%	14%	15%	16%
-15%	5%	6%	7%	8%	10%	11%	12%	13%	14%
-10%	4%	5%	6%	7%	8%	9%	10%	12%	13%
-5%	2%	4%	5%	6%	7%	8%	9%	10%	11%
0	2%	3%	4%	5%	6%	7%	8%	9%	10%
5%	1%	2%	3%	4%	5%	6%	7%	8%	9%
10%	0%	1%	2%	3%	4%	5%	6%	7%	8%
15%	-1%	0%	1%	2%	3%	4%	5%	6%	7%
20%	-2%	-1%	0%	1%	2%	3%	4%	5%	6%

The results show that the investment cost and the savings jointly contribute to the financial performance. Clearly, with 20% higher savings and 20% lower investment cost, the IRR is positive (16%). However, as observed above, households usually do not make their investment decisions based on IRR and NPV.

D.2 Public sector buildings

Two models have been developed, one for a hospital and one for a school, to gauge the feasibility of improvements in energy efficiency in public sector buildings. In Yerevan alone, there are:

- 31 health centres, each with an average of over 3,000 m^2 heated floor space.
- 211 kindergartens and schools, each with an average of over 1,400 m^2 heated floor space.

D.1.1 Complex measures with both supply (fuel switching) and demand measures

Technical analysis

The technical parameters used in the analysis are as follows:

Building parameters		
Country		Armenia
City		Masis
Heating degree days	Degree days (K.d)	2,940
# of sub-buildings	#	5 (including a corridor)
Height of buildings	m	3 to 10
Total area of buildings	m^2	6,052
Area of building envelope (incl. roof)	m^2	6,620
Area of building envelope - windows	m^2	923
Area of entrance doors	m^2	56
Area of building envelope - outer wall	m^2	2,984
Useful surface area of the building	m^2	3,941
Area of roof	m^2	2,657

A complex set of efficiency measures are applied in the model: namely, thermal insulation around the windows, window replacement, roof insulation, new doors, and the replacement of an electrical heating system with a natural gas heating system. Additionally, the lighting system is improved by using compact fluorescent lights (CFLs) instead of incandescent bulbs.

Calculated energy needs and potential savings for these measures are calculated in their entirety. The overall investment parameters are as follows:

Measure	Units	Unit price	Total cost
	m^2	US$ / m^2	US$ total
Insulation of the outer walls of the cavities beneath the windows	390	16.51	6,500
EE windows	680	86.78	59,100
EE doors	31	120.13	3,800
Roofing insulation	2,657	8.93	23,800
Total for demand-side measures			**93,200**
Total for heating system replacement with a gas boiler system			**118,800**
Total for EE improvements in the thermal system			**212,000**
Replacement of incandescent lamps with compact fluorescent light bulbs (CFLs)	463 pcs	4.10	1,899

The total energy savings possible as a result of changing the heating system and better insulating the building is 43%, and savings in lighting electricity of 80% as indicated in the table below.

Characteristic	Unit	Before	After
Type of heating	Type	Electricity	Natural Gas
Boiler / stove efficiency	%	100%	90%
Fuel used - heating	Type	Electricity	Natural Gas
Fuel price	$/kWh	$0.0578	$0.0228
CO_2 coefficient	(kg/MWh)	436	247
Quantity of thermal energy required for heating	kWh	939,229	478,284
The thermal coefficient taking into account the net loss after application of heat	%	99%	98%
Quantity of thermal energy required for heating the building per m^2	kWh/m^2	157	90
Fuel used - heating	kWh	948,716	542,272
Savings - heating	kWh		406,444
Savings - heating	%		43%
Electricity used – lighting	kWh	79,732	15,946
Savings - electricity	kWh		63,786
Savings - electricity	%		80%
Rebound effect	%		40%
Savings - heating (with rebound effect)	kWh		243,866
Savings - electricity (with rebound effect)	kWh		38,272

In the calculation above and below, a factor of 40% is used to adjust savings for the suppressed demand: i.e. savings are taken as only 60% of the modelled savings based on full utilisation.

Financial and economic analysis

Using the technical analysis above, an economic and financial assessment has been carried out. The results are given in the tables below:

Financial and Economic Analysis of the building			Year after realisation															
			0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
Price change (heat)	%		0.00%	1.00%	1.00%	1.00%	1.00%	1.00%	1.00%	1.00%	1.00%	1.00%	1.00%	1.00%	1.00%	1.00%	1.00%	1.00%
Fuel/heat price	($/MWh)		29.8	30.1	30.4	30.7	31.0	31.3	31.6	31.9	32.3	32.6	32.9	33.2	33.6	33.9	34.2	34.6
Total % increase	%		0%	1%	2%	2%	3%	4%	5%	6%	7%	8%	9%	10%	12%	13%	14%	15%
Price change (Electricity)	%		0.00%	1.00%	1.00%	1.00%	1.00%	1.00%	1.00%	1.00%	1.00%	1.00%	1.00%	1.00%	1.00%	1.00%	1.00%	1.00%
Price	($/MWh)		66.9	67.5	68.2	68.9	69.6	70.3	71.0	71.7	72.4	73.1	73.9	74.6	75.4	76.1	76.9	77.6
Total % increase	%		0%	1%	2%	2%	3%	4%	5%	6%	7%	8%	9%	10%	12%	13%	14%	15%
Investment parameters		**Total**	**Year after realisation**															
Total investment cost	211,984		0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
Own funds	20%	42,397	42,397															
Grant	5%	10,599	10,599															
Loan	75%	158,988	158,988															
Total investment cost		211,984	211,984															
Non-grant investment	($ p.a)	201,385	201,385															
Income/ Savings (grant dependent)																		
Yearly - heat	($ p.a)	456,733		28,374	28,658	28,944	29,234	29,526	29,821	30,120	30,421	30,725	31,032	31,343	31,656	31,973	32,292	32,615
Yearly - lighting	($ p.a)	41,192		2,559	2,585	2,610	2,637	2,663	2,690	2,716	2,744	2,771	2,799	2,827	2,855	2,884	2,912	2,942
GHG reduction value	($ p.a)	113,765		7,584	7,584	7,584	7,584	7,584	7,584	7,584	7,584	7,584	7,584	7,584	7,584	7,584	7,584	7,584
Simple payback and IRR																		
Cash flow	($)	296,540	-201,385	30,933	31,242	31,555	31,870	32,189	32,511	32,836	33,164	33,496	33,831	34,169	34,511	34,856	35,205	35,557
Cumulative Cash Flow	($)		-201,385	-170,452	-139,209	-107,655	-75,784	-43,595	-11,085	21,751	54,916	88,412	122,243	156,412	190,923	225,779	260,984	296,540
Simple Payback Period	Months	76		12.0	12.0	12.0	12.0	12.0	12.0	4.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Financial IRR	(%)	13.8%																
Discount rate	(%)	10.0%	Standard discount rate described in discussions															

NPV	**($)**	**42,538**																
Economic value	**($)**	**399,706**	-211,984	38,517	38,827	39,139	39,455	39,773	40,095	40,420	40,749	41,080	41,415	41,754	42,095	42,440	42,789	43,141
Economic IRR	**(%)**	**17.0%**																

The economic analysis takes into account increasing fuel prices and an economic benefit of reduced GHG emissions valued at $25 per tonne of CO_{2eq} reduced.

With a 5% grant, there is a simple payback of 6.3 years, a financial IRR of 13.8% and an economic IRR of 17.0%. These results justify investments from the Government / city administration.

Financial analysis with leveraged investments

The loan calculation is shown below using a sample loan for a term of 5 years with a 6% interest rate (lower than the residential sector because the loan-taker would be the municipal or national Government) and 1% bank fees. It can be noticed that the leveraged IRR is higher than the non-leveraged IRR (15% leveraged versus 13.8% non-leveraged), implying that lending for these types of investments (for which financial analysis is commonly carried out, in contrast to the residential sector) could be successful.

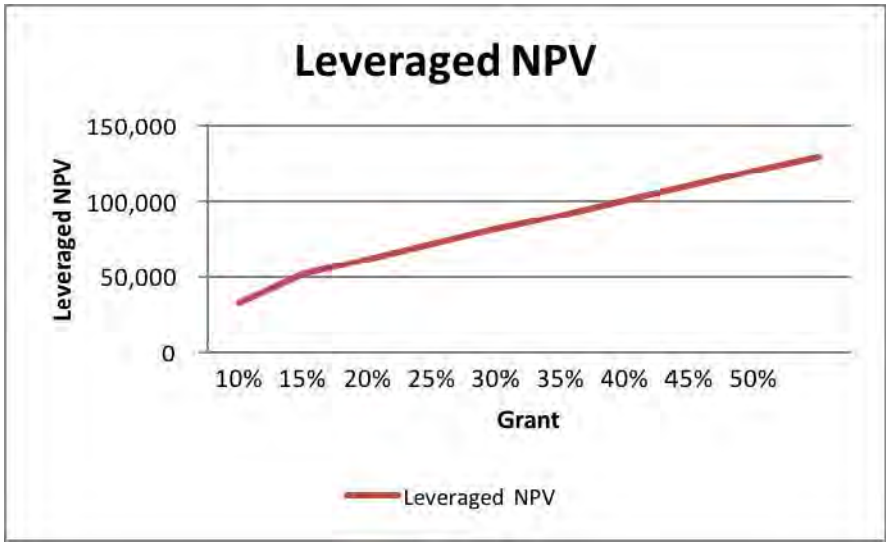
Loan calculation													
Maturity period	**year**	**5**											
Credit interest rate	**%**	**6.0%**	**Year after realisation**										
Bank fees	**%**	**1.0%**	**0**	**1**	**2**	**3**	**4**	**5**	**6**	**7**	**8**	**9**	**10**
Balance brought forward	**($)**		0	132,092	101,897	69,890	35,963	0	0	0	0	0	0
Drawdown	**($)**	158,988	158,988										
Bank fees	**($)**	1,590	1,590										
Principal repayment	**($)**	-160,578	-28,486	-30,195	-32,007	-33,927	-35,963	0	0	0	0	0	0
Interest repayment	**($)**	-30,025	-9,635	-7,926	-6,114	-4,193	-2,158	0	0	0	0	0	0
Total debt service	**($)**	**-190,603**	**-38,121**	**-38,121**	**-38,121**	**-38,121**	**-38,121**	**0**	**0**	**0**	**0**	**0**	**0**
Balance carried forward	**($)**		**132,092**	**101,897**	**69,890**	**35,963**	**0**	**0**	**0**	**0**	**0**	**0**	**0**
Cash flow for the building	**($)**	264,925	-80,517	-7,188	-6,878	-6,566	-6,250	32,189	32,511	32,836	33,164	33,496	33,831
Cumulative cash flow for the building	**($)**		-80,517	-87,705	-94,583	-101,149	-107,399	-75,210	-42,700	-9,864	23,301	56,797	90,628
Payback period	**Months**	**87.6**	0.0	12.0	12.0	12.0	12.0	12.0	12.0	12.0	3.6	0.0	0.0

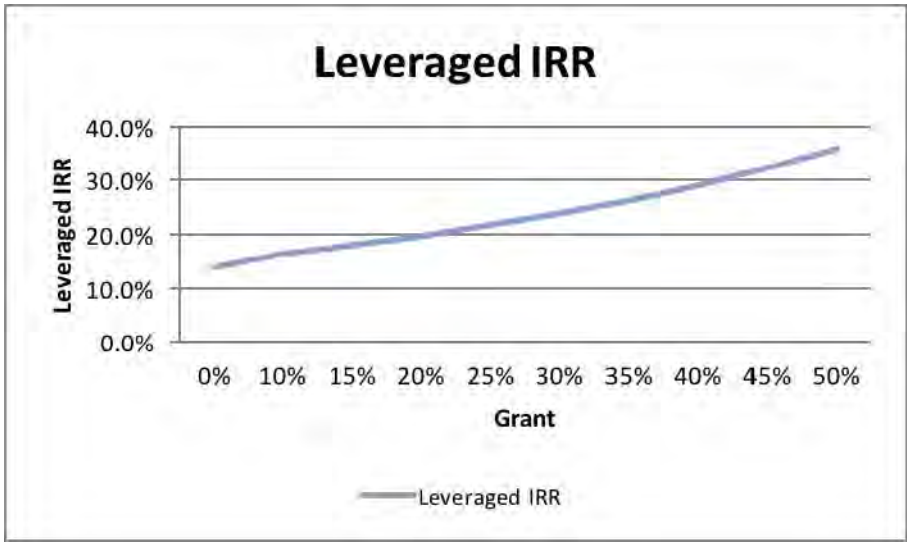
Leveraged IRR	**(%)**	**15.0%**											
Leveraged NPV	**($)**	**42,565**											
			1	2	3	4	5	6	7	8	9	10	
Monthly credit repayment (total)			$3,176.72	$3,176.72	$3,176.72	$3,176.72	$3,176.72	$0.00	$0.00	$0.00	$0.00	$0.00	
Monthly credit repayment per entity			$3,176.72	$3,176.72	$3,176.72	$3,176.72	$3,176.72	$0.00	$0.00	$0.00	$0.00	$0.00	
Monthly saving per entity			$2,577.75	$2,603.53	$2,629.56	$2,655.86	$2,682.42	$2,709.24	$2,736.33	$2,763.70	$2,791.33	$2,819.25	
Efficiency of payments ($saving/$payment)			0.81	0.82	0.83	0.84	0.84						

A sensitivity analysis is carried out by varying the amount of the grant. The leveraged NPV and IRR are shown in the figures below. It can be noticed that there is a positive IRR and positive NPV even without a grant. However, experience in other countries (e.g. EU[122]) and knowledge of the Armenian market indicate that the market and lending will likely increase much more quickly with a small grant to incentivise first-movers amongst municipalities. The incentive also provides necessary stimulus to support higher energy efficiency standards.

It is also noteworthy that the price for natural gas in public sector buildings (US$ 22.80 per MWh) is significantly less than the price for households (US$ 35.30 per MWh). Should the price for the public sector increase, then the financial aspects of savings would improve significantly.

[122] http://iet.jrc.ec.europa.eu/energyefficiency/sites/energyefficiency/files/final_report_on_financing_ee_in_buildings.pdf


Leveraged NPV
150,000
100,000
50,000
0
Leveraged NPV
10% 15% 20% 25% 30% 35% 40% 45% 50%
Grant
Leveraged NPV


Leveraged IRR
40.0%
30.0%
20.0%
10.0%
0.0%
Leveraged IRR
0% 10% 15% 20% 25% 30% 35% 40% 45% 50%
Grant
Leveraged IRR

Additional sensitivity analysis was undertaken for two other variables as follows:

1. **Costs of investment**
2. **Savings value**

Both of these variables are increased and decreased by up to 20%, with the following results on the leveraged IRR from the base case of 15%, with a baseline grant level of 5%:

Investment cost	**Savings**								
	-20%	-15%	-10%	-5%	0%	5%	10%	15%	20%
-20%	15%	17%	18%	20%	22%	23%	25%	27%	28%
-15%	13%	15%	17%	18%	20%	21%	23%	24%	26%
-10%	12%	14%	15%	16%	18%	19%	21%	22%	24%
-5%	11%	12%	14%	15%	16%	18%	19%	21%	22%
0	10%	11%	12%	14%	15%	16%	18%	19%	20%
5%	9%	10%	11%	12%	14%	15%	16%	18%	19%
10%	8%	9%	10%	11%	13%	14%	15%	16%	17%
15%	7%	8%	9%	10%	12%	13%	14%	15%	16%
20%	6%	7%	8%	9%	11%	12%	13%	14%	15%

The sensitivity analysis shows a positive investment under most scenarios. The baseline analysis already includes an allowance for a 40% rebound effect, so savings are likely underestimated. Even with 20% higher investment costs, the IRR is 11%, indicating a slightly positive NPV.

D.1.2 Simple measures – demand-side measures only

Technical analysis

The technical parameters used in the analysis are the same as for the model above, but the building is assumed to use natural gas before and after refurbishment, and only demand-side measures are introduced.

Calculated energy needs and potential savings for these measures are calculated in their entirety.

The total energy saving possible as a result of better insulating the building is 49%.

Characteristic	**Unit**	**Before**	**After**
Type of heating	Type	Natural Gas	Natural Gas
Boiler/stove efficiency	%	90%	90%
Fuel used - heating	Type	Natural Gas	Natural Gas
Fuel price	$/kWh	$ 0.0298	$ 0.0298

CO_2 coefficient	(kg/MWh)	247	247
Quantity of thermal energy required for heating	kWh	939,229	478,284
The thermal coefficient taking into account the net loss after application of heat	%	98%	98%
Quantity of thermal energy required for heating the building per m^2	kWh/m^2	176	90
Fuel used - heating	kWh	1,064,885	542,272
Energy savings - annual	kWh		522,613
Savings	%		49%
Electricity used – lighting	kWh	79,732	15,946
Savings - electricity	kWh		63,786
Savings - electricity	%		80%
Rebound effect	%		40%
Savings - heating (with rebound effect)	kWh		313,568
Savings - electricity (with rebound effect)	kWh		38,272

In the calculations above and below, a factor of 40% is used to adjust savings for the suppressed demand: i.e. savings are taken as only 60% of the modelled savings based on full utilisation.

Financial and economic analysis

Using the technical analysis above, an economic and financial assessment has been carried out. The results are given in the tables below:

Financial and Economic Analysis for the Building			Year after realisation															
			0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
Price change (heat)	%		0.00%	1.00%	1.00%	1.00%	1.00%	1.00%	1.00%	1.00%	1.00%	1.00%	1.00%	1.00%	1.00%	1.00%	1.00%	1.00%
Fuel/heat price	($/MWh)		29.8	30.1	30.4	30.7	31.0	31.3	31.6	31.9	32.3	32.6	32.9	33.2	33.6	33.9	34.2	34.6
Total % increase	%		0%	1%	2%	2%	3%	4%	5%	6%	7%	8%	9%	10%	12%	13%	14%	15%
Price change (Electricity)	%		0.00%	1.00%	1.00%	1.00%	1.00%	1.00%	1.00%	1.00%	1.00%	1.00%	1.00%	1.00%	1.00%	1.00%	1.00%	1.00%
Price	($/MWh)		66.9	67.5	68.2	68.9	69.6	70.3	71.0	71.7	72.4	73.1	73.9	74.6	75.4	76.1	76.9	77.6
Total % increase	%		0%	1%	2%	2%	3%	4%	5%	6%	7%	8%	9%	10%	12%	13%	14%	15%
Investment parameters		**Total**	**Year after realisation**															
Total investment cost	94,184		0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
Own funds	20%	18,837	18,837															
Grant	8%	7,535	7,535															
Loan	72%	67,812	67,812															
Total investment cost		94,184	94,184															
Non-grant investment	($ p.a)	86,649	86,649															
Income/ Savings (grant dependent)																		
Yearly - heat	($ p.a)	150,329		9,339	9,432	9,527	9,622	9,718	9,815	9,914	10,013	10,113	10,214	10,316	10,419	10,523	10,629	10,735
Yearly - lighting	($ p.a)	41,192		2,559	2,585	2,610	2,637	2,663	2,690	2,716	2,744	2,771	2,799	2,827	2,855	2,884	2,912	2,942
GHG reduction value	($ p.a)	38,497		2,566	2,566	2,566	2,566	2,566	2,566	2,566	2,566	2,566	2,566	2,566	2,566	2,566	2,566	2,566
Simple payback and IRR																		
Cash flow	($)	104,872	-86,649	11,898	12,017	12,137	12,259	12,381	12,505	12,630	12,756	12,884	13,013	13,143	13,274	13,407	13,541	13,676
Cumulative Cash Flow	($)		-86,649	-74,751	-62,734	-50,597	-38,339	-25,958	-13,453	-823	11,934	24,817	37,830	50,973	64,247	77,654	91,195	104,872
Simple Payback Period	Months	85		12.0	12.0	12.0	12.0	12.0	12.0	12.0	0.8	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Financial IRR	(%)	11.7%																
Discount rate	(%)	10.0%	Standard discount rate described in discussions															

NPV	**($)**	**8,008**																
Economic value	**($)**	**135,834**	-94,184	14,464	14,583	14,704	14,825	14,948	15,071	15,196	15,323	15,450	15,579	15,709	15,841	15,973	16,108	16,243
Economic IRR	**(%)**	**13.6%**																

The economic analysis takes into account increasing fuel prices and an economic benefit of reduced GHG emissions valued at $25 per tonne of CO_{2eq} reduced.
With a 5% grant, there is a simple payback of 7 years, a financial IRR of 11.7% and an economic IRR of 13.6%.

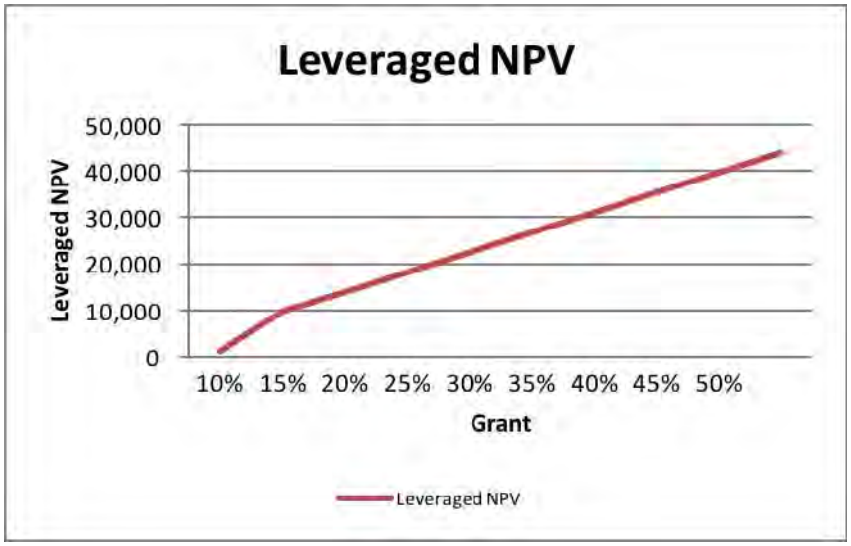
Financial analysis with leveraged investments
The loan calculation is shown below using a sample loan for a term of 5 years with a 6% interest rate (lower than the residential sector because the loan-taker would be the municipal or national Government) and 1% bank fees. It can be noticed that the leveraged IRR is higher than the non-leveraged IRR (15% leveraged versus 13.8% non-leveraged), implying that lending for these types of investments could be successful.

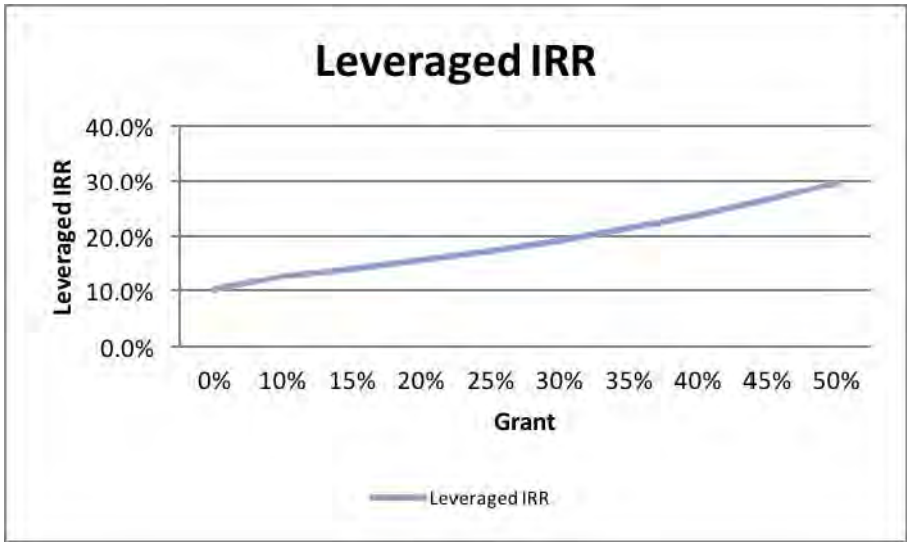
Loan calculation for the building													
Maturity period	**year**	**5**											
Credit interest rate	**%**	**6.0%**	**Year after realisation**										
Bank fees	**%**	**1.0%**	**0**	**1**	**2**	**3**	**4**	**5**	**6**	**7**	**8**	**9**	**10**
Balance brought forward	**($)**		0	56,341	43,462	29,810	15,339	0	0	0	0	0	0
Drawdown	**($)**	67,812	67,812										
Bank fees	**($)**	678	678										
Principal repayment	**($)**	-68,491	-12,150	-12,879	-13,652	-14,471	-15,339	0	0	0	0	0	0
Interest repayment	**($)**	-12,807	-4,109	-3,380	-2,608	-1,789	-920	0	0	0	0	0	0
Total debt service	**($)**	**-81,297**	**-16,259**	**-16,259**	**-16,259**	**-16,259**	**-16,259**	**0**	**0**	**0**	**0**	**0**	**0**
Balance carried forward	**($)**		**56,341**	**43,462**	**29,810**	**15,339**	**0**	**0**	**0**	**0**	**0**	**0**	**0**
Cash flow for the building	**($)**	91,387	-35,096	-4,361	-4,242	-4,122	-4,001	12,381	12,505	12,630	12,756	12,884	13,013
Cumulative cash flow for the building	**($)**		-35,096	-39,458	-43,700	-47,822	-51,823	-39,442	-26,937	-14,307	-1,551	11,333	24,345
Payback period	**Months**	**97.4**	0.0	12.0	12.0	12.0	12.0	12.0	12.0	12.0	12.0	1.4	0.0
Leveraged IRR	**(%)**	**12.2%**											
Leveraged NPV	**($)**	**8,020**											

	1	2	3	4	5	6	7	8	9	10	
Monthly credit repayment (total)	$1,354.95	$1,354.95	$1,354.95	$1,354.95	$1,354.95	$0.00	$0.00	$0.00	$0.00	$0.00	
Monthly credit repayment per entity	$1,354.95	$1,354.95	$1,354.95	$1,354.95	$1,354.95	$0.00	$0.00	$0.00	$0.00	$0.00	
Monthly saving per entity	$991.50	$1,001.42	$1,011.43	$1,021.54	$1,031.76	$1,042.08	$1,052.50	$1,063.02	$1,073.65	$1,084.39	
Efficiency of payments ($saving/$payment)	0.73	0.74	0.75	0.75	0.76						

A sensitivity analysis is carried out by varying the amount of the grant. The leveraged NPV and IRR are shown in the figures below. It can be noticed that there is a positive IRR and positive NPV even without a grant. However, experience in other countries (e.g. Russia) and knowledge of the Armenian market indicate that the market and lending will likely increase much more quickly with a small grant to incentivise first-movers amongst municipalities.

It is also noteworthy that the price for natural gas in public sector buildings (US$ 29.80 per MWh) is significantly less than the price for households (US$ 35.30 per MWh). Should the price for the public sector increase, then the financial aspects of savings would improve significantly.





Additional sensitivity analysis was undertaken for two other variables as follows:

1. **Costs of investment**
2. **Savings value**

Both of these variables are increased and decreased by up to 20%, with the following results on the leveraged IRR from the base case of 12.2%, with a baseline grant level of 8%:

	Savings								
Investment cost	-20%	-15%	-10%	-5%	0%	5%	10%	15%	20%
-20%	12%	14%	15%	17%	18%	20%	21%	22%	24%
-15%	11%	12%	14%	15%	16%	18%	19%	20%	22%
-10%	10%	11%	12%	14%	15%	16%	17%	19%	20%
-5%	8%	10%	11%	12%	13%	15%	16%	17%	18%
0	7%	9%	10%	11%	12%	13%	15%	16%	17%
5%	6%	8%	9%	10%	11%	12%	13%	14%	16%
10%	6%	7%	8%	9%	10%	11%	12%	13%	14%
15%	5%	6%	7%	8%	9%	10%	11%	12%	13%
20%	4%	5%	6%	7%	8%	9%	10%	11%	12%

The analysis shows a positive situation where the investment has an IRR of over 10% for most scenarios. The baseline analysis already includes an allowance for a 40% rebound effect, so savings are likely underestimated.

D.3 Overall impacts

The overall impacts of the GCF project have been estimated using the data from the technical and financial analysis. The overall impacts are summarised in the tables below:

	Average cost per retrofit (US$)	**Number of buildings**	**Total investment (US$)**
Single-family individual buildings	10,000	6,000	60,000,000
Multi-family apartment buildings	120,000	290	34,800,000
Public buildings (complex demand- and supply-side renovation, such as for a hospital)	250,000	23	5,750,000
Public buildings (simple demand-side measures, such as for a school)	95,000	150	14,250,000
Total		**6,463**	**114,800,000**

The average level of grant to be provided relates to the building-type and is based on knowledge of the level of incentive necessary to stimulate the market.[123] Note that the grant will be means-based, meaning that poor and vulnerable households will receive higher grants (e.g. 50% of their portion of the retrofit costs), and wealthy households will not receive any financial support at all. Single-family houses in cities require less grant support since there are fewer poor households. The higher grant for apartment buildings reflects both higher numbers of poor households and also the additional stimulus needed to incentivise the collective decision-making required in such buildings.

For public buildings and the complex building model that involves both demand- and supply-side investments, the payback period is much shorter and this investment has a positive NPV, so the average grant level can be lower. For a more basic set of measures, the payback period is longer and, therefore, a higher level of incentive is needed. Average estimated grant values are given below:

	Average level of grant (%)	Average grant per building (US$)	Total amount of grant (US$)
Single-family individual buildings	9%	900	5,400,000
Multi-family apartment buildings	22%	26,400	7,656,000
Public buildings (complex demand and supply side renovation, such as for a hospital)	5%	12,500	287,500
Public buildings (simple demand side measures, such as for a school)	8%	7,600	1,140,000
Total			14,483,500

Other impacts
Direct beneficiaries of the project (who continue to benefit after the project for the lifetime of the investments) are calculated using an average household size of 5 and an average number of dwellings per apartment building of 36. For public buildings, beneficiaries are taken as the average number of permanent building residents. For a hospital, this is the hospital staff, not the number of short-term users (patients).

Jobs created by the project are based on data in Ürge-Vorsatz, D. *et al*. (2010): *Employment Impacts of a Large-Scale Deep Building Energy Retrofit Programme in Hungary.*[124] This detailed study takes into account jobs created in the construction sector, from the supply chain and from additional spending of additional disposable income as a result of financial savings. It also accounts for job losses in the energy supply sector resulting from reduced energy demand. The study finds that that, on average, 17 jobs are created per million Euros invested (approximately 15 jobs per million US$). This employment factor is used here to estimate the number of jobs created as a result of the investments facilitated by the project. In order for the job creation to be sustained,

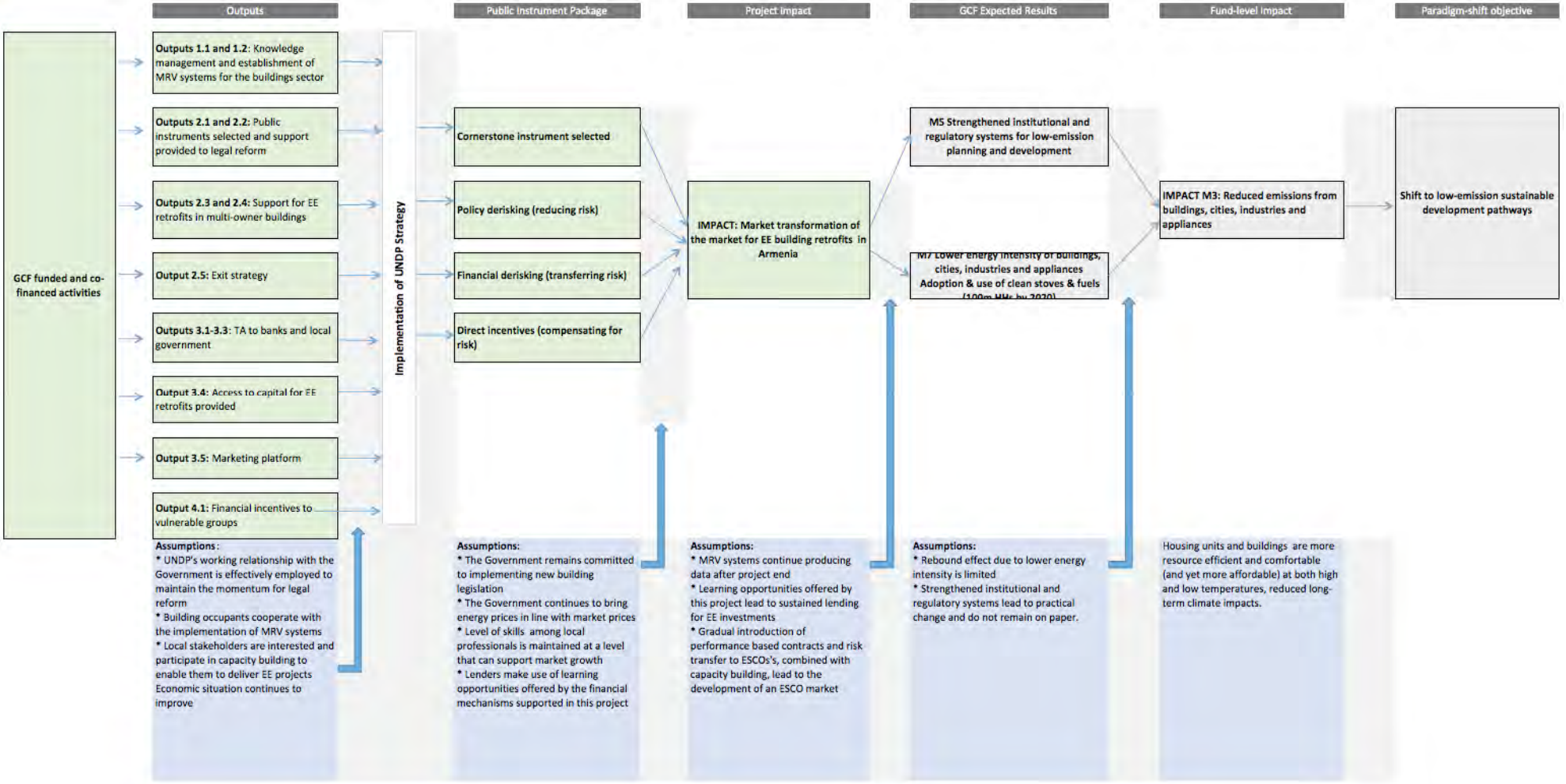
[123] See, for example, https://www.energy-community.org/portal/page/portal/ENC_HOME/CALENDAR/Other_Meetings/2015/03_Jun and https://www.energy-community.org/portal/page/portal/ENC_HOME/DOCS/3284024/Guidance_Note_on_Residential_Energy_Efficiency_programs.pdf

[124] See http://3csep.ceu.edu/projects/employment-impacts-of-a-large-scale-deep-building-energy-retrofit-programme-in-hungary

there is an implicit assumption that lending will continue at the same rate in the future. If the retrofit investment market were to shrink after the project comes to an end, many of the jobs created would be lost.

	Number of direct beneficiaries from this project	Jobs created through this project
Single-family individual buildings	30,000	900
Multi-family apartment buildings	52,200	500
Public buildings (large, such as hospitals)	23,000	100
Public buildings (small, such as schools)	105,000	200
Total	210,200	1,700

Annex 17. Theory of Change



Annex 18. GHG reduction calculations

GHG reductions were calculated using a methodology in line with the methodology for calculating the GHG benefits of Global Environment Facility energy efficiency projects.[125] This involves the following steps for estimating direct emissions reductions and indirect emissions reductions – with the following relevant definitions:[126]

- **Direct GHG emission reductions** are those achieved by project investments such as technology demonstrations and discrete investments financed or leveraged during the project's supervised implementation period (from the project start to the project closure).

- In contrast, **indirect GHG emission reductions** are considered to be those achieved, for example, as a result of market facilitation and development through project-supported policy and institutional frameworks, capacity building, information gathering, and replication effects of demonstration activities.

It should be noted that within the calculations, a "rebound effect" is included which reduces energy savings from those that would theoretically occur. The rebound effect is the reduction in expected gains from energy efficiency due to behavioural or other systemic responses. In energy efficiency in buildings, this is mostly related to an increase in energy/fuel consumption to improve comfort or increase the amount of the building which is heated or lit. Factoring in the rebound effect is important in instances where buildings are either under-heated or under-lit, which is often the case in developing countries – including in Armenia.

GHG emission analysis – direct emissions reductions

Step 1: Calculate the amount of energy and GHG reduced per unit of investment

The calculations of savings per unit of investment were based on the models of energy savings in the following typical buildings described in Annex 14:

- Single-family house
- Multi-family apartment building
- Public sector buildings: Complex measures with both supply (fuel switching) and demand measures
- Public sector buildings: Simple measures – demand-side measures only

The emission coefficient for natural gas was taken from the Global Environment Facility's (GEF) GHG calculation worksheets for natural gas and electricity. **The value used is 247 kg CO_2/MWh.**

For electricity, the grid emission factor is taken from the IGES database[127] and is based on the CDM combined margin approach. **The value used is 436 kg CO_2/MWh.**

The energy savings and GHG reductions per unit of investment are provided in the following tables. Note that:

- The cells highlighted in pink in the table 1 for fuel consumption and CO_2 savings are then utilised as inputs into the table 2;
- For the residential sector, the rebound effect is 20% - i.e. the energy savings will only be 80% of the theoretical savings;
- For the public buildings sector, the rebound effect is 40% - i.e. the energy savings will only be 60% of the theoretical savings.

[125] see

https://www.thegef.org/gef/pubs/STAP/Methodology-for-Calculating-GHG-Benefits-of-GEF-Energy-Efficiency-Projects-v.1 under "Financial Instruments"

[126] See https://www.thegef.org/gef/sites/thegef.org/files/publication/GEF%20EE%20Methodology%20v1.0.pdf – page 6

[127] To be found at http://pub.iges.or.jp/modules/envirolib/view.php?docid=2136

Table 1. Calculated GHG savings per single-family house

	Unit	Equations and notes on sources	Before	After	Theor. Savings	Theor. Savings (%)	Rebound effect	After rebound effect	Savings	Savings (%)
Equations			A	B	C = A - B	D = C / A	F	G = A - (C x (1 - F))	H = C - G	I = H / A
End-use energy demand per building - heating	kWh/ year	**Line 1: derived from building model and audits**	28,512	6,532	21,980	77%	20%	10,928	17,584	62%
Boiler/stove efficiency	%	**Line 2: based on energy audits**	90%	90%						
Fuel consumption per building - heating	kWh/ year	**Line 3 = Line 1 / Line 2**	31,680	7,258	24,422	77%	20%	12,142	19,538	62%
End-use energy demand per building – DHW	kWh/ year	**Line 4: derived from building model and audits**	1,600	1,600	0	0%	0%	1,600	0	0%
Fuel consumption per building - DHW	kWh/ year	**Line 5 = Line 4 / Line 2**	1,778	1,778	0	0%	0%	1,778	0	0%
CO_2 emissions - Natural gas	kg CO_2/ kWh of natural gas	**Line 6: GEF standard emission factors**	0.247	0.247						
CO_2 emissions	kg CO_2/ year	**Line 7 = (Line 3 + Line 5) x Line 6**	8,264	2,232	6,032	73%		3,438	4,826	58%

Environmental benefit		
Yearly energy saved	**kWh**	19,538
Yearly GHG reductions	**kg CO_2**	4,826
Lifetime of investment	**Years**	20
Emissions reduction over the lifetime of investment	**Tonnes CO_2**	97
Investment per building	**US $**	10,630
GCF Grant per building	**US $**	957
Cost per tonne of abatement	**US$/ tonne CO_2**	$110.14
Cost of GCF grant per tonne of abatement	**US $/ tonne CO_2**	$9.91
Energy saved per year per USD	**kWh/(US$-year)**	1.84
GHG abatement per year per USD	**kg CO_2/US$-year**	0.454

Table 2. Calculated GHG savings per apartment building

	Unit	Equations and notes on sources	Before	After	Theor. Savings	Theor. Savings (%)	Rebound effect	After rebound effect	Savings	Savings (%)
Equations			A	B	C = A - B	D = C / A	F	G = A - (C x (1 - F))	H = C - G	I = H / A
End-use energy demand per building - heating	kWh/ year	**Line 1: derived from building model and audits**	463,890	112,622	351,268	76%	20%	182,876	281,014	61%
Boiler/stove efficiency	%	**Line 2: based on energy audits**	90%	90%						
Fuel consumption per building - heating	kWh/ year	**Line 3 = Line 1 / Line 2**	515,434	125,136	390,298	76%	20%	203,196	312,238	61%
Energy consumption per building - DHW	kWh/ year	**Line 4: derived from building model and audits**	54,000	54,000	0	0%	0%	54,000	0	0%
Fuel consumption per building - DHW	kWh/ year	**Line 5 = Line 4 / Line 2**	60,000	60,000	0	0%	0%	60,000	0	0%
CO_2 emissions coefficient - Natural gas	kg CO_2 /kWh of natural gas	**Line 6: GEF standard emission factors**	0.247	0.247						
CO_2 emissions	kg CO_2/ year	**Line 7 = (Line 3 + Line 5) x Line 6**	142,132	45,729	96,404	68%		65,009	77,123	54%

Environmental benefit		
Yearly energy saved	**kWh**	312,238
Yearly GHG reductions	**kg CO_2**	77,123
Lifetime of investment	**Years**	20
Emissions reduction over the lifetime of investment	**Tonnes CO_2**	1,542
Investment per building	**US $**	$116,705
GCF Grant per building	**US $**	$25,675
Cost per tonne of abatement	**US$/ tonne CO_2**	$75.66
Cost of GCF grant per tonne of abatement	**US $/ tonne CO_2**	$16.65
Energy saved per year per USD	**kWh/ US$-year**	2.68
GHG abatement per year per USD	**kg CO_2/ US$-year**	0.661

Table 3. Calculated GHG savings per public building – with complex measures

	Unit	Equations and notes on sources	Before	After	Theor. Savings	Theor. Savings (%)	Rebound effect	After rebound effect	Savings	Savings (%)
Equations			A	B	C = A - B	D = C / A	F	G = A - (C x (1 - F))	H = C - G	I = H / A
Heat										
End-use energy demand per building - heating	kWh/ year	**Line 1: derived from building model and audits**	939,229	478,284	460,945	49%	40%	662,662	276,567	61%
Heater efficiency	%	**Line 2: based on energy audits**	100%	90%						
The thermal coefficient taking into account the net loss after application of heat	%	**Line 3: based on energy audits**	99%	98%						
Fuel consumption per building - heating	kWh/ year	**Line 4 = Line 1 / (Line 2 x Line 3)**	948,716	542,272	406,444	43%	40%	704,850	243,866	26%
CO_2 emissions coefficient - Natural gas	kg CO_2/ kWh of electricity or natural gas	**Line 5: GEF standard emission factors**	0.436	0.247						
CO_2 emissions	kg CO_2/ year	**Line 6 = Line 4 x Line 6**	413,640	133,941	279,699	68%	40%	245,821	167,819	41%
Electricity										

	Unit	Equations and notes on sources	Before	After	Theor. Savings	Theor. Savings (%)	Rebound effect	After rebound effect	Savings	Savings (%)
Fuel consumption per building - other (electricity)	kWh/ year	**Line 7: derived from building model and audits**	79,732	15,946	63,786	80%	40%	41,460	38,272	48%
CO_2 emissions coefficient - electricity	kg CO_2/ kWh of electricity	**Line 8: GEF standard emission factors**	0.436	0.436						
CO_2 emissions	kg CO_2/ year	**Line 9 = Line 7 x Line 8**	34,763	6,952	27,811	80%	40%	18,077	16,686	48%

Environmental benefit		
Yearly energy saved	**kWh**	282,138
Yearly GHG reductions	**kg CO_2**	184,506
Lifetime of investment	**Years**	20
Emissions reduction over the lifetime of investment	**Tonnes CO_2**	3,690
Investment per building	**US $**	$211,984
GCF Grant per building	**US $**	$10,599
Cost per tonne of abatement	**US$/ tonne CO_2**	$57.45
Cost of GCF grant per tonne of abatement	**USD/ tonne CO_2**	$2.87
Energy saved per year per USD	**kWh/(US$-year)**	1.33
GHG abatement per year per USD	**kg CO_2/US$-year**	0.870

Table 4. Calculated GHG savings per public building – with simple measures

	Unit	Equations and notes on sources	Before	After	Theor. Savings	Theor. Savings (%)	Rebound effect	After rebound effect	Savings	Savings (%)
Equations			**A**	**B**	**C = A - B**	**D = C / A**	**F**	**G = A - (C x (1 - F))**	**H = C - G**	**I = H / A**
Heat										
End-use energy demand per building - heating	kWh/ year	**Line 1: derived from building model and audits**	939,229	478,284	460,945	49%	40%	662,662	276,567	61%
Heater efficiency	%	**Line 2: based on energy audits**	90%	90%						
The thermal coefficient taking into account the net loss after application of heat	%	**Line 3: based on energy audits**	98%	98%						
Fuel consumption per building - heating	kWh/ year	**Line 4 = Line 1 / (Line 2 x Line 3)**	1,064,885	542,272	522,613	49%	40%	751,317	313,568	29%

CO_2 emissions coefficient - Natural gas	kg CO_2/ kWh of electricity or natural gas	**Line 5: GEF standard emission factors**	0.247	0.247						
CO_2 emissions	kg CO_2/ year	**Line 6 = Line 4 x Line 6**	263,027	133,941	129,086	49%	40%	185,575	77,451	29%
Electricity										
Fuel consumption per building - other (electricity)	kWh/ year	**Line 7: derived from building model and audits**	79,732	15,946	63,786	80%	40%	41,460	38,272	48%
CO_2 emissions coefficient - electricity	kg CO_2/ kWh of electricity	**Line 8: GEF standard emission factors**	0.436	0.436						
CO_2 emissions	kg CO_2/ year	**Line 9 = Line 7 x Line 8**	34,763	6,952	27,811	80%	40%	18,077	16,686	48%

Environmental benefit		
Yearly energy saved	**kWh**	351,840
Yearly GHG reductions	**kg CO_2**	94,138
Lifetime of investment	**Years**	20
Emissions reduction over the lifetime of investment	**Tonnes CO_2**	1,883
Investment per building	**US $**	$94,184
Grant per building	**US $**	$7,535
Cost per tonne of abatement	**US$/ tonne CO_2**	$50.02
Cost of grant per tonne of abatement	**USD/ tonne CO_2**	$4.00
Energy saved per year per USD	**kWh/(US$-year)**	3.74
GHG abatement per year per USD	**kg CO_2/US$-year**	1.000

Step 2: Scale-up energy and GHG reductions to the estimated amount of investment

Using the model buildings as a guide to potential energy and GHG reductions, the estimated total emission reductions from the project investments have been calculated. The summary of energy savings (in GWh per year) and GHG emissions savings (in tonnes of CO_{2eq} per year) are given in the table below along with the lifetime GHG savings of the investments – assuming a useful lifetime of investments of 20 years, which is typical for interventions in buildings.

Type of building	**Energy saved per year per USD invested (kWh per USD-year)**	**GHG abatement per year per USD invested (kg CO_2 per USD-year)**	**Amount of investment (US $)**	**Energy savings (GWh) per year**	**GHG savings (tonnes CO_2) per year**	**Lifetime GHG savings (20 years)**
Equation	**A**	**B**	**C**	**D = A x C**	**E = B x C**	**F = E x 20**
Single-family individual buildings	1.84	0.454	$60,000,000	110.28	27,239	544,783

Multi-family apartment buildings	2.68	0.661	$34,800,000	93.11	22,997	459,942
Public buildings (complex demand and supply side renovation, such as for a hospital)	1.33	0.870	$5,750,000	7.65	5,005	100,093
Public buildings (simple demand side measures, such as for a school)	3.74	1.000	$14,250,000	53.23	14,243	284,860
Total			**$114,800,000**	**264.27**	**69,484**	**1,389,677**

GHG emission analysis – indirect emissions reductions

The project will undertake a number of activities beyond simple investments that will also stimulate the market for energy efficiency in the residential and public building sectors. Therefore, there will be indirect energy savings triggered by investments not within the direct control of the project. These are estimated using bottom-up and top-down approaches based on the GEF methodology.

As stated in the GEF's methodology,[128] the bottom-up method involves multiplying direct emission reductions by a replication factor, intended to reflect how many times the investments achieved during the project period might be repeated during an "influence period" (e.g. 10 years) after the project closure.

The top-down method involves multiplying total market potential for CO_2 emission reductions by a causality factor (CF). Market potential combines technical and economic market potential for the technology within the 10 years after the project's lifetime. The CF is the percentage of a realized market potential that can be reasonably attributed to the long-term effect of the project as the result of overcoming market barriers

Step 3: Estimate indirect emissions reductions using bottom-up methodology

For bottom-up emission estimates, the estimated direct reductions are multiplied by a replication factor – with the expectation that the volume of investments and GHG emissions reductions will increase by a factor of 3 over a 10-year period after project completion due to the project intervention. This is a modest replication factor according to GEF practice.

Indirect bottom-up emissions savings estimates	
Direct GHG Emission Savings (tCO_2)	1,389,677
Number of Replications Post-project as Spill-Over	3
Indirect Bottom-up Emission Savings (tCO_2)	4,169,032

Step 4: Estimate indirect emissions reductions using top-down methodology

To estimate the indirect GHG emission reductions using a top-down methodology, total 10-year market size is estimated based on the following estimations:

- The total numbers of each building-type in the country;
- The market-penetration rates over the course of 10 years after project completion if the project is carried out;
- The total emissions reduction over the lifetime of investments for each type of building;
- The total emissions reduction over the lifetime of investments for each type of building given these market penetration rates;
- The impact on this market development given an estimated GCF causality factor. For this calculation, a level 2 causality factor is used (modest – i.e. 40%)

The total market / penetration is as given in the table below.

Indirect top-down emissions savings estimates	**# of units in the country**	**Estimated 10-year market penetration rate**	**Investment per unit (US$)**	**Emissions reduction per unit over the lifetime of investment (tonnes CO_2)**	**Total potential reductions (tonnes CO_2)**
Equation	**A**	**B**	**C**	**D**	**E = A x B x D**
Single family individual buildings	392,590	20%	10,000	91	7,129,207
Multi-family apartment buildings	4,300	20%	120,000	1,586	1,363,964

[128] https://www.thegef.org/gef/sites/thegef.org/files/publication/GEF%20EE%20Methodology%20v1.0.pdf – see page 4

Indirect top-down emissions savings estimates	# of units in the country	Estimated 10-year market penetration rate	Investment per unit (US$)	Emissions reduction per unit over the lifetime of investment (tonnes CO_2)	Total potential reductions (tonnes CO_2)
Public buildings (complex demand and supply side renovation, such as for a hospital)	180	50%	250,000	4,352	391,669
Public buildings (simple demand side measures, such as for a school)	2,326	50%	95,000	1,899	2,208,614
Total Market Potential (lifetime tCO_2 emissions)					11,093,455
Causality factor					40%
Indirect Top-Down Emission Reductions (tCO_2)					4,437,382

The overall GHG emission results are therefore as follows:

	Cumulative		
	Total	***2016-2021***	***2022-2041***
Direct Total Energy Savings (GWh)	5,285	5,285	0
Direct GHG Emission Savings (tCO_2)	1,389,677	1,389,677	0
Indirect Bottom-up Emission Savings (tCO_2)	4,169,032		4,169,032
Indirect Top-down Emission Savings (tCO_2)	4,437,382		4,437,382

Based upon a total grant of US$ 20 million, the cost per tonne of direct CO_2 reduction will be US$ 14.39. Additionally, significant indirect emissions savings can be expected – between 4.2 and 4.4 million tonnes of CO_2 reduction due to the project interventions (5.6 to 5.8 $MtCO_2e$, combining direct and indirect estimates) – yielding a total estimated cost per tonne of CO_2 reduced of between US $3.43 and US $3.60. Based on these calculations, the project is very cost-effective.

Annex 19. Project Activities and Inputs

The following information is taken from UNDP's GCF proposal, section H.1.2 Outcomes, Outputs, Activities and Inputs at the Programme/Project Level

Activities	Description	Inputs	Description
1.1.1 MRV framework	Development of the MRV framework, including guidelines and monitoring methodologies for the various categories of buildings	International consultants, Local consultants, PMU staff time, Funds	Hiring of consultants to develop MRV framework in conjunction with the project team
1.1.2 EMIS implementation	Support to full implementation of building EMIS in targeted buildings for demonstration and capacity building purposes	Software International consultants, Local consultants, PMU staff time, Funds	Following competitive tender and based on detailed technical specifications, Ministry of Nature Protection financially supported for the purchase of EMIS systems
1.2.1 Stakeholder engagement	Identifying appropriate formats for reaching the relevant stakeholders	International consultants, Local consultants, PMU staff time, Funds	Specialist communications consultants engaged to develop communications strategy
1.2.2 Website	Establishment of a website that will provide information and a platform for communication between the different stakeholders	Web developer, Web hosting	Competitive tender for Web design and implementation
1.2.3 Formats for dissemination	Formats for information dissemination will be developed based on their likely effectiveness for raising awareness, facilitating information access and providing actionable guidance and support to the sector	International consultants, Local consultants, PMU staff time, Funds	Specialist communications consultants assist with the development of informative and accessible literature and other media communications tailored to specific user-groups
1.2.4 Information provision	Provision of information to consumers	Printing and publication costs, International consultants, Local consultants, PMU staff time, Funds	Procurement of design and print services, and development of accessible information products
2.1.1 Public instrument selection	The project will make use of UNDP's framework to support policy-makers in selecting public instruments to promote energy efficiency investment in developing countries	Workshops (2) and meetings (15), International consultants, Local consultants, PMU staff time, Funds	Specialist DREI consultants and UNDP staff to assist in instrument selection
2.2.1 Technical specialist support to authorities to adopt and implement an enabling policy framework	Support to national, sub-national and local authorities to adopt and implement an enabling policy framework for EE retrofits.	International consultants, Local consultants, PMU staff time, Funds	Hiring of consultants to assist in preparation of policies and regulations defining the terms of EE retrofits
2.2.2 Introduction of legislation	Support to the gradual introduction of binding legislation on energy auditing, energy passports / certificates	International consultants, Local consultants, PMU staff time,	Hiring of consultants to assist in design and implementation of legislation, and the design and

Activities	Description	Inputs	Description
	and labelling for existing buildings	Funds	implementation of auditing, passports and labelling
2.2.3 Public building legislation	Support to the introduction of legislation specific to public buildings	International consultants, Local consultants, PMU staff time, Funds	Hiring of consultants to assist in design and implementation of legislation
2.3.1 Technical support from experts to policy-makers in developing policy related to HOA legal status, payment enforcement and management	Support to policy-makers in developing policy relating to HOA legal status, payment enforcement, professional management and consensus levels	International consultants, Local consultants, PMU staff time, Funds	Hiring of consultants to advise and develop evidence base for policy-makers for development of HOA policy
2.4.1 Legal support to management of multi-owner buildings related to energy efficiency retrofits	Provide support on legal matters related to EE retrofit projects for multi-owner buildings	International consultants, Local consultants, PMU staff time, Funds	Specialist legal support hired on a retainer basis and made available to retrofit projects as and when required
2.4.2 ESCOs	Provide support to establishing ESCOs	International consultants, Local consultants, PMU staff time, Funds	Specialist technical and legal consultants hired to assist with support to ESCO establishment
2.5.1 Exit strategy	Development and implementation of exit strategy	International consultants, Local consultants, PMU staff time, Funds	Hiring of consultants to advise on design and implementation of post-project impact sustainability measures
3.1.1 Technical support provided to banks to develop and market energy efficiency products to individual residences	Provide support to banks to develop and market products for energy efficiency in individual residences	International consultants, Local consultants, PMU staff time, Funds	Technical and financial consultants hired to assist with support to local banks
3.2.1 Technical support provided to banks to develop and market energy efficiency products to multi-owner building management (HOAs)	Support to development of bank products for HOAs	International consultants, Local consultants, PMU staff time, Funds	Technical and financial consultants hired to assist with support to local banks
3.3.1 Publicly-owned buildings	Support to the process of identification, development and aggregation of technically and financially feasible EE retrofit projects in publicly-owned buildings	International consultants, Local consultants, PMU staff time, Funds	Specialist consultants hired to assist with development of screening criteria and aggregation methodologies for EE retrofit projects in public buildings
3.4.1 Technical structure for financial instruments	Establishment and maintenance of the technical structure for the financial de-risking instruments offered	Concessional loans: US$ 86.25 million	Mode of operation of the financial de-risking instruments designed, implemented and documented
3.4.2 Verification	Verification of funded investments	International consultants, Local consultants, PMU staff time, Funds	MRV system designed, implemented and documented

Activities	Description	Inputs	Description
3.5.1 Marketing support	Provide marketing support to banks	Printing and publication costs, International consultants, Local consultants, PMU staff time, Funds	Specialist communications consultants assist with the development of literature and other media communications tailored to specific customer segments
4.1.1 Targeted incentives	Targeted financial incentives provided to building / apartment owners, or the ESCOs serving these clients	Incentives: US$ 14 million	Mode of operation of the financial incentives designed, implemented and funds transferred