## Part I: Project Information

**GEF ID**
**10996**

**Project Type**
FSP

**Type of Trust Fund**
GET

**CBIT/NGI**
CBIT **No**
NGI **No**

**Project Title**
Developing National Capacity of Turkmenistan through Improving Regulatory Environment towards Energy Efficient and Sustainable Building Sector

**Countries**
Turkmenistan

**Agency(ies)**
UNDP

**Other Executing Partner(s)**
UNDP

**Executing Partner Type**
GEF Agency

**GEF Focal Area**
Climate Change

**Sector**
Energy Efficiency

**Taxonomy**

Focal Areas, Climate Change, United Nations Framework Convention on Climate Change, Nationally Determined Contribution, Climate Change Mitigation, Technology Transfer, Financing, Energy Efficiency, Renewable Energy, Influencing models, Demonstrate innovative approache, Deploy innovative financial instruments, Strengthen institutional capacity and decision-making, Convene multi-stakeholder alliances, Transform policy and regulatory environments, Stakeholders, Local Communities, Private Sector, Individuals/Entrepreneurs, Capital providers, SMEs, Financial intermediaries and market facilitators, Large corporations, Civil Society, Community Based Organization, Beneficiaries, Type of Engagement, Participation, Information Dissemination, Partnership, Consultation, Communications, Education, Public Campaigns, Awareness Raising, Behavior change, Gender Equality, Gender results areas, Access to benefits and services, Knowledge Generation and Exchange, Participation and leadership, Capacity Development, Gender Mainstreaming, Gender-sensitive indicators, Sex-disaggregated indicators, Women groups, Capacity, Knowledge and Research, Innovation, Knowledge Generation, Enabling Activities, Knowledge Exchange, Learning, Theory of change, Indicators to measure change, Adaptive management

**Rio Markers**

**Climate Change Mitigation**

Principal Objective 2

**Climate Change Adaptation**

No Contribution 0

**Biodiversity**

No Contribution 0

**Land Degradation**

No Contribution 0

**Submission Date**

6/23/2023

**Expected Implementation Start**

5/1/2024

**Expected Completion Date**

4/30/2029

**Duration**

60In Months

**Agency Fee($)**

196,302.00

**A. FOCAL/NON-FOCAL AREA ELEMENTS**

| Objectives/Programs | Focal Area Outcomes | Trust Fund | GEF Amount($) | Co-Fin Amount($) |
|---|---|---|---|---|
| CCM-1-3 | Promote innovation and technology transfer for sustainable energy breakthroughs for accelerating energy efficiency adoption. | GET | 2,066,333.00 | 42,975,713.00 |
| | | **Total Project Cost($)** | **2,066,333.00** | **42,975,713.00** |

**B. Project description summary**

**Project Objective**

To support Turkmenistan?s low carbon development in the achievement of climate mitigation goals by reducing GHG emissions from multi-family residential (and public) buildings.

| Project Component | Financing Type | Expected Outcomes | Expected Outputs | Trust Fund | GEF Project Financing($) | Confirmed Co-Financing($) |
|---|---|---|---|---|---|---|
| 1. Piloting energy efficient technologies and EMIS in residential and public buildings | Investment | 1. N early-zero energy (NZE) options demonstrated (through advanced building envelope upgrades and renewables) with information systems installed and tested | 1.1 Investment in nearly-zero energy (NZE) measure and information systems in public and multi-family residential pilot building | GET | 765,000.00 | 39,246,428.00 |

| Project Component | Financing Type | Expected Outcomes | Expected Outputs | Trust Fund | GEF Project Financing($) | Confirmed Co-Financing($) |
|---|---|---|---|---|---|---|
| 1. Piloting energy efficient technologies and EMIS in residential and public buildings | Technical Assistance | 1. N early-zero energy (NZE) options demonstrated (through advanced building envelope upgrades and renewables) with information systems installed and tested | 1.2 Energy performance of NZEB pilot buildings assessed and compared with reference buildings<br><br>1.3 Public investment strategy for NZEB-type high-rise construction (submitted for adoption before the end of the Project) | GET | 386,841.00 | 446,285.00 |

| Project Component | Financing Type | Expected Outcomes | Expected Outputs | Trust Fund | GEF Project Financing($) | Confirmed Co-Financing($) |
|---|---|---|---|---|---|---|
| 2. Policy, regulations and institutional mechanism for energy efficient buildings sector | Technical Assistance | 2. NZEB construction design regulations proposed with strengthened institutional framework and enforcement policy | 2.1 White papers prepared on the real cost of fossil fuel subsidies to the public budget and on cost-effective means of reducing energy consumption in the building sector<br><br>2.2 NZEB-compatible design criteria developed for buildings and current building codes updated<br><br>2.3 National NZEB plan [for Government consideration] | GET | 335,608.00 | 560,000.00 |

| Project Component | Financing Type | Expected Outcomes | Expected Outputs | Trust Fund | GEF Project Financing($) | Confirmed Co-Financing($) |
|---|---|---|---|---|---|---|
| 3. Knowledge sharing and capacity building | Technical Assistance | 3. Strengthened and better-informed stakeholders on state-of-the-art construction in buildings and compliance with new building codes | 3.1 Life-cycle-cost assessment methodologies are introduced<br><br>3.2 Increased capacity and knowledge of government officials and other stakeholders on NZEB construction planning, assessments, monitoring and evaluation | GET | 402,756.00 | 463,000.00 |
| 4. Monitoring and evaluation | Technical Assistance | 4. Project?s M&E has been implemented | 4.1 Monitoring and evaluation | GET | 77,753.00 | 110,000.00 |
| | | | **Sub Total ($)** | | **1,967,958.00** | **40,825,713.00** |

**Project Management Cost (PMC)**

| | | |
|---|---|---|
| GET | 98,375.00 | 2,150,000.00 |
| **Sub Total($)** | **98,375.00** | **2,150,000.00** |
| **Total Project Cost($)** | **2,066,333.00** | **42,975,713.00** |

**Please provide justification**

**C. Sources of Co-financing for the Project by name and by type**

| Sources of Co-financing | Name of Co-financier | Type of Co-financing | Investment Mobilized | Amount($) |
|---|---|---|---|---|
| Recipient Country Government | Ministry of Environmental Protection (MEP) | In-kind | Recurrent expenditures | 1,314,285.00 |
| Recipient Country Government | Ministry of Construction and Architecture (MCA) | Public Investment | Investment mobilized | 13,000,000.00 |
| Recipient Country Government | Ministry of Energy (MOE) | Public Investment | Investment mobilized | 27,096,428.00 |
| Recipient Country Government | Ministry of Energy (MOE) | In-kind | Recurrent expenditures | 1,475,000.00 |
| GEF Agency | UNDP | Grant | Investment mobilized | 50,000.00 |
| GEF Agency | UNDP | In-kind | Recurrent expenditures | 40,000.00 |
| | | | **Total Co-Financing($)** | **42,975,713.00** |

**Describe how any "Investment Mobilized" was identified**

Public investment under the aegis of the ?Presidential Programme for socio-economic development of Turkmenistan for the period of 2022-2028? adopted by presidential decree No. 179, dated July 07, 2022. provides relevant co-financing for the construction of pilot NZEB multi-floor residential and office buildings through the Ministries involved. Within the above-mentioned Presidential Programme, the Ministry of Energy plans to make investments into upgrading electricity transformers and transmission lines with the introduction of energy efficient equipment and other interventions for the total amount of 100 mln. Turkmen Manats (TMT), (equiv. of USD 28,571,428 at an official exchange rate of USD 1 = 3.5 TMT). The Ministry of Construction and Architecture is committing USD 13 mln., which is estimated cost of building of one multi-family residential building and one public (kindergarten) building. The Ministry of Environmental Protection is ready to commit 4.6 mln. TMT (equiv. of USD 1,3 mln.) within the above-mentioned Programme intended for various greening interventions around Ashgabat. The co-financing figures provided by the Ministries involved include part of their regular administrative budget, which they are ready to commit (in-kind) co-financing to upgrade buildings codes in Turkmenistan and elaborate corresponding NZEB strategy and planning, as well as incorporating additional staffing aspects (e.g., new officers for MRV and enforcement) relevant to the upgraded codes? application. The GEF INV (USD

750,000) is meant as a top up NZE investment to already state-of-the-art buildings to reach full ?nearly-zero energy? (NZE) characteristics. It should be noted that during project implementation an investment strategy will be implemented with an estimated value of incremental NZE investment of about USD 11.3 million, leading to an estimated CO2 emission reduction of 81.6 ktCO2 (in addition to the 5.2 ktCO2 of the project-supported two pilot NZEBs.

**D. Trust Fund Resources Requested by Agency(ies), Country(ies), Focal Area and the Programming of Funds**

| Agency | Trust Fund | Country | Focal Area | Programming of Funds | Amount($) | Fee($) | Total($) |
|---|---|---|---|---|---|---|---|
| UNDP | GET | Turkmenistan | Climate Change | CC STAR Allocation | 2,066,333 | 196,302 | 2,262,635.00 |
| | | | **Total Grant Resources($)** | | **2,066,333.00** | **196,302.00** | **2,262,635.00** |

**E. Non Grant Instrument**

NON-GRANT INSTRUMENT at CEO Endorsement

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Includes Non grant instruments? **No**

Includes reflow to GEF? **No**

**F. Project Preparation Grant (PPG)**

PPG Required **true**

**PPG Amount ($)**

100,000

**PPG Agency Fee ($)**

9,500

| Agency | Trust Fund | Country | Focal Area | Programming of Funds | Amount($) | Fee($) | Total($) |
|---|---|---|---|---|---|---|---|
| UNDP | GET | Turkmenistan | Climate Change | CC STAR Allocation | 100,000 | 9,500 | **109,500.00** |
| | | | **Total Project Costs($)** | | **100,000.00** | **9,500.00** | **109,500.00** |

## Core Indicators

**Indicator 6 Greenhouse Gas Emissions Mitigated**

| Total Target Benefit | (At PIF) | (At CEO Endorsement) | (Achieved at MTR) | (Achieved at TE) |
|---|---|---|---|---|
| Expected metric tons of CO?e (direct) | 94331 | 86911 | 0 | 0 |
| Expected metric tons of CO?e (indirect) | 770287 | 760507 | 0 | 0 |

**Indicator 6.1 Carbon Sequestered or Emissions Avoided in the AFOLU (Agriculture, Forestry and Other Land Use) sector**

| Total Target Benefit | (At PIF) | (At CEO Endorsement) | (Achieved at MTR) | (Achieved at TE) |
|---|---|---|---|---|
| Expected metric tons of CO?e (direct) | | | | |
| Expected metric tons of CO?e (indirect) | | | | |
| Anticipated start year of accounting | | | | |
| Duration of accounting | | | | |

**Indicator 6.2 Emissions Avoided Outside AFOLU (Agriculture, Forestry and Other Land Use) Sector**

| Total Target Benefit | (At PIF) | (At CEO Endorsement) | (Achieved at MTR) | (Achieved at TE) |
|---|---|---|---|---|
| Expected metric tons of CO?e (direct) | 94,331 | 86,911 | | |
| Expected metric tons of CO?e (indirect) | 770,287 | 760,507 | | |
| Anticipated start year of accounting | 2023 | 2024 | | |
| Duration of accounting | 20 | 20 | | |

**Indicator 6.3 Energy Saved (Use this sub-indicator in addition to the sub-indicator 6.2 if applicable)**

| Total Target Benefit | Energy (MJ) (At PIF) | Energy (MJ) (At CEO Endorsement) | Energy (MJ) (Achieved at MTR) | Energy (MJ) (Achieved at TE) |
|---|---|---|---|---|
| Target Energy Saved (MJ) | 490,029,000 | 1,580,208,000 | | |

**Indicator 6.4 Increase in Installed Renewable Energy Capacity per Technology (Use this sub-indicator in addition to the sub-indicator 6.2 if applicable)**

| Technology | Capacity (MW) (Expected at PIF) | Capacity (MW) (Expected at CEO Endorsement) | Capacity (MW) (Achieved at MTR) | Capacity (MW) (Achieved at TE) |
|---|---|---|---|---|
| Solar Photovoltaic | | 2.10 | | |

**Indicator 11 People benefiting from GEF-financed investments**

| | Number (Expected at PIF) | Number (Expected at CEO Endorsement) | Number (Achieved at MTR) | Number (Achieved at TE) |
|---|---|---|---|---|
| **Female** | 35,000 | 3,714 | | |
| **Male** | 35,000 | 4,726 | | |
| **Total** | 70000 | 8440 | 0 | 0 |

Provide additional explanation on targets, other methodologies used, and other focal area specifics (i.e., Aichi targets in BD) including justification where core indicator targets are not provided

Notes on accounting lifetime (see Annex G for details) - Direct emissions reduction: accounting starts year 1 up to 2048 (project period + investment for period of 20 years of building use) - Indirect emissions reduction: accounting starts after the project?s end: 2029-2059 (post-project 10-year period of indirect investments plus max 20 years) Direct emissions reductions are attributable to the investments made in two pilot buildings (Output 1.1) and investments approved/implemented in the latter years of TEESB following the drafting of new upgraded energy-relevant building codes and NZEB public investment strategy (Outputs 1.3 and 2.2). Indirect emission mitigation results come from post-project investment flows (for 10 years after project?s end) in NZEB buildings following approved NZEB-type upgraded building codes (for new buildings) and public NZEB strategy. GHG emission estimates are slightly lower than the PIF?s (see Exhibit 4), although energy savings have increased. An detailed explanation for the discrepancy is given in Annex E (additional information on GHG); in short, the PPG phase has provided more nuance to the calculation methods, and assumptions for the basis for the determination of energy savings and substitution potential in reference apartment and office buildings.

## Part II. Project Justification

### 1a. Project Description

1a. Project Description.

1) *The global environmental and/or adaptation problems, root causes and barriers that need to be addressed (systems description)**[1]***[1]*;

Greenhouse gas (GHG) emissions from energy were 54.3 million tons of $CO_2$ ($MtCO_2$) in 2010, 70.9 $MtCO_2$ in 2016 and 94.3 $MtCO_2$ in 2021[2]2. The National Strategy on Climate Change the Government of Turkmenistan identifies the housing sector (along with other high GHG emitting sectors) as one of the priority areas for reducing GHG emissions that will help to achieve its commitments within the Paris Agreement.

Multi-story buildings provided two-thirds of buildings stock. Many of these apartments, built in the Soviet era or shortly after, are heated with district heating (often supplemented by electric heaters where heat delivery is unreliable) and cooled with electric air conditioning units. This group of buildings represent a large potential for future refurbishment and reconstruction. Newer high-rise, built in the past two decades, rely largely rely on free-standing, building-level, or multi-building natural gas boilers for heat and hot water, and building-level or multi-building chillers for cooling. The buildings are often constructed by government entities and then apartments are sold individually to prospective dwellers.

Turkmenistan has considerable potential for energy savings through the implementation of energy efficiency measures on the consumption side. Based on existing inefficiencies and baseline consumption figures, the residential and services sectors were identified as a high priority. For this reason, during 2011-20, UNDP with several Turkmen national partners, led by the state utility Turkmengaz, implemented the project ?Improving Energy Efficiency in the Residential Buildings Sector of Turkmenistan (EERB)?, seeking to achieve the transformation of the buildings sector towards a more rational use of energy (and correspondingly curtailing greenhouse gas emissions). EERB focused on the renovation of the existing building stock and improve the design of more energy-efficient new buildings. Modernization efforts included the revision of building codes, improved designs (reduced energy loss in basic construction elements, such as roofs, cellars, and walls) and better practices (such as using automatic temperature regulators). By training professionals and demonstrating best practices (in a number of pilot buildings, the EERB Project has helped to improve energy efficiency in the residential buildings sector in Turkmenistan. Through updating the regulatory framework, the project introduced revised building codes (SNT, from the Russian-language abbreviation, namely a) SNT ?Residential Buildings?, SNT ?Roofs and Roofing?, SNT ?Building

Climatology? and SNT ?Building Thermal Engineering?. These were introduced during 2016-2017 and approved in 2020.

However, the Ministry of Construction and Architecture has not approved yet the corresponding ?Instruction on the composition and procedures of project documentation for the construction of buildings?. Also, the regulations on the rules and procedures for energy audits of residential buildings in Turkmenistan are still under consideration. While the implementation of TNC standards was enforced through a design review and site checks, no actual auditing is required to determine the energy performance of buildings. Such limitations shed doubt on how effectively the new energy-related building codes are implemented.

Given the Paris Agreement?s push to move towards a net-zero carbon emissions world by 2050. Regarding the building sector, the long-term solution for a sustainable reduction of greenhouse gases (GHG) is to reduce and potentially stop the construction of any new residential and public buildings with significant GHG footprints. Multiple types of savings and economies of scale can be obtained when modern building technologies are utilized in the design and construction to reduce energy losses, e.g., by using ventilation with heat recovery and heat pumps. The greenhouse gas emitted from the remaining energy consumption in the building for heating, cooling and ventilation can be compensated for by using renewable energy, e.g., solar photovoltaics (PV) to get a ?near-zero emissions? building (NEZB). Turkmenistan must also move towards enforceable NZEB standards for all new construction.

To achieve a wider replication of the results of the EESB project and move towards NZE construction, several important barriers and gaps remain:

*1. Low energy prices and electricity tariffs resulting in excessive payback periods*

A long period of provision of free electricity and natural gas for a large share of the population (and low tariffs for those who pay) has led to low awareness of efficiency in energy (and water use). From 1993 to 2017-2019, citizens even received government-provided electricity, water and natural gas almost free of charge. The idea was that by providing subsidized utility services, the population would enjoy a high standard of living. Recently, the government has started implementing gradual tariff reforms to transition and adopt market measures in the management of the national economy and gradually phasing out subsidies for natural gas, electricity, water and table salt to citizens. The Decree prescribing the abolition of the free supply of electricity, gas, potable water, and table salt to citizens was signed in January 2019. However, there is no clear action plan with specific regulations to achieve the full transition to a zero-subsidy regime for fossil fuels.

Thus, there remains the obvious disincentive for end-users to make efforts to reduce energy consumption, due to the very low tariff for heat and electricity in Turkmenistan. In the longer run, there is a clear incentive for the government itself to reduce end-use consumption of natural gas: exports of natural gas provide valuable revenues to the state budget, while internal consumption is financed mostly by the government. Therefore, any natural gas saved through energy efficiency can be exported; the financial gain for the government is the difference between international market prices and having no or having negative revenue (counting the cost of fuel subvention).

*2. Energy-relevant building codes are not in line with nearly-zero requirements*

The latest set of energy-efficiency building codes (approved in 2020 and formulated with support from the EERB project; see *Annex G.1* in the UNDP Project Document) is already in need of being updated for new buildings if the aim is ?nearly-zero energy?. This means that the 2020 building codes need to be further revised to achieve further energy demand reductions of about 50% relative to the energy performance implicated in the standards currently in place (by making the building envelope energy-efficient and using heat pump technology) and to meet the residual demand by using renewable energy sources (such as rooftop solar panels) as much as possible.

*3. Lack of institutional capacity for updating, verification and enforcement of energy-efficiency building codes*

While current regulation calls for building codes to be updated every five years or so, what is lacking is clear legislation (with an action for its implementation) for minimum energy performance codes in particular and for promoting rational use of energy in buildings in general and necessary institutional setup for monitoring, verification and enforcement (MVE). Such plans have been proposed in the past, but in practice face a difficult path to approval by the Cabinet of Ministers of Turkmenistan, in particular when budget commitments are implicated.

While the various government agencies (at the national and local level) have the financial resources to invest in highly energy-efficient, expensive, buildings, they often lack the specific expertise and knowledge to effectively pursue the idea of taking into account high-efficiency or integrating renewable energy in building design and construction. Many staff of the Ministry of Construction and Architecture (and other government entities) have been trained to implement obsolete construction standards before the latest set of norms and standards (promoted in the before-mentioned EESB project) were approved in 2020. These standards did take account of the energy efficiency requirements (in terms of the maximum specific heat consumption per $m^2$ per degree-day) but they did not consider the energy performance of buildings per se and thus there were no incentives to construct buildings that would exceed those performance requirements. The Government is constrained in its technical capacity to design legislation to enact implementation, verification and enforcement systems to implement the current building codes and to update according to the latest international development, such as norms for nearly-zero buildings.

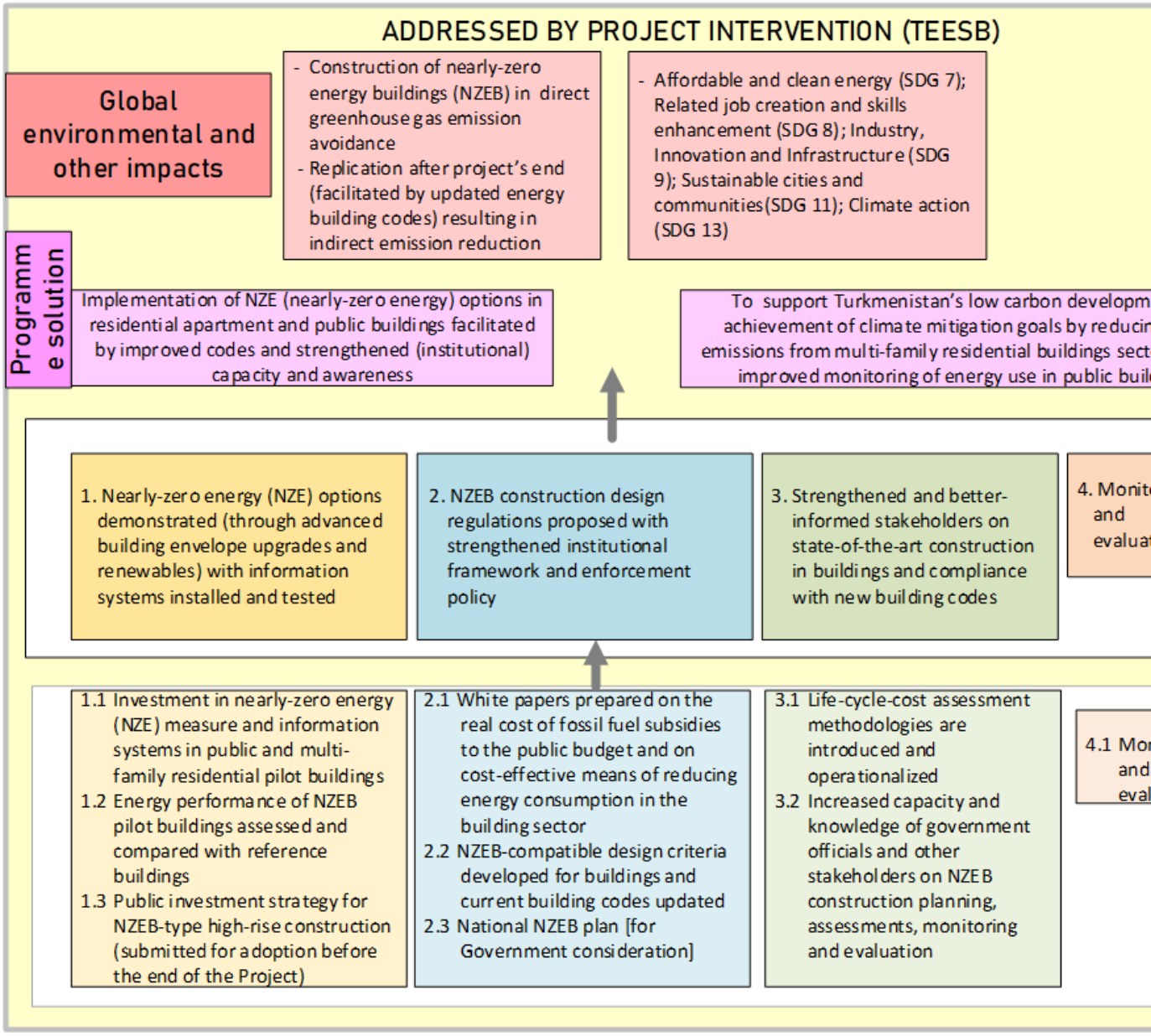
4. *NZE technologies and measures have not been demonstrated in Turkmenistan, while related knowledge and technical skills need to be improved*

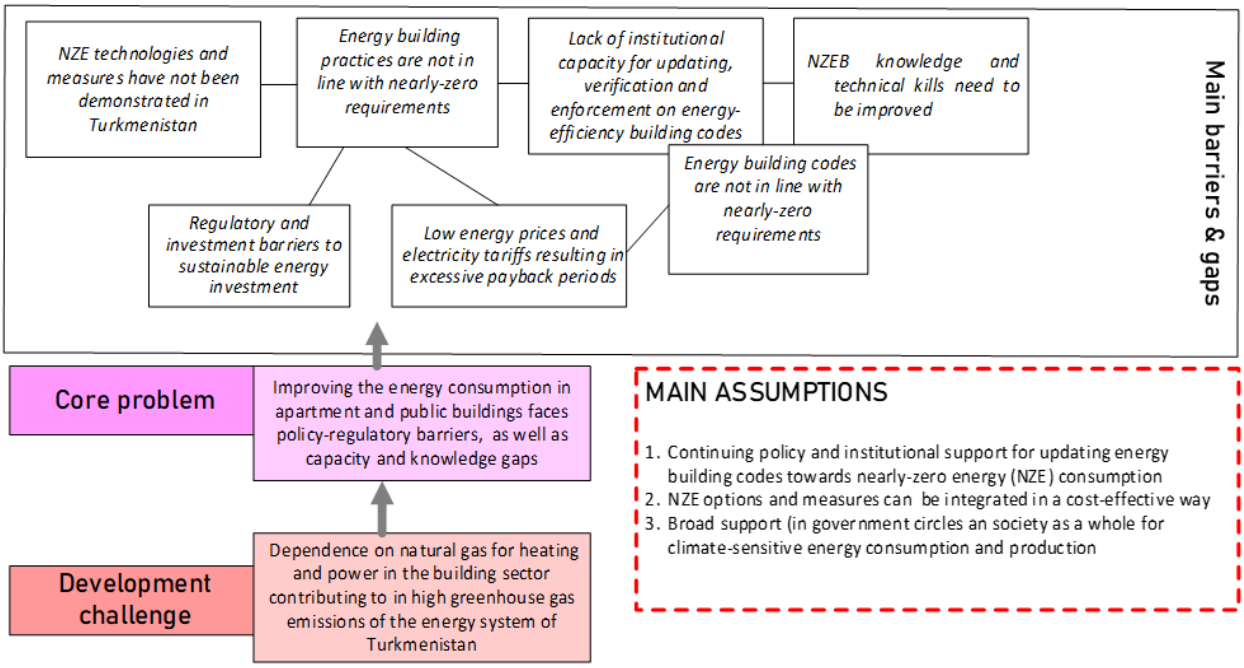
Currently, no building is constructed having NZEB standards in mind and applications of renewable energy (e.g., solar PV or solar thermal) are normally not integrated with building designs. Architects, engineers, and policy-makers have insufficient knowledge and capacities to identify techniques that correspond with requirements on low-carbon or net-zero carbon goals (NZEB). As a result, an innovative market for these types of buildings will not develop with local architects and engineers not up to date in skills and knowledge.

5. *Regulatory and investment barriers to sustainable energy investment*

The primary barriers to doing business in Turkmenistan are the lack of policies and information. Additionally, power plants are ageing, but there is no official power sector modernization plan in place. In 2022, the Ministry of Energy announced a tender for materials for solar panels; in the next few years, more tenders or installation auctions are likely to be held for utility-scale power generation. Renewable energy generation in small and medium?sized installations in remote and sparsely populated areas is planned for the short term. Additional action is required to improve Turkmenistan?s appeal to investors, including the establishment of a clear power tariff structure (and higher transparency in the tariff-setting process), shortening the lengthy administrative processes, and opening the electricity generation market. The establishment of special incentive schemes for renewable energy projects, such as feed-in tariffs or a capacity auction on a least-cost basis, would potentially lead to a higher investment inflow.

**Exhibit 1 Theory of change: how TEESB?s interventions address identified barriers and challenges**


ADDRESSED BY PROJECT INTERVENTION (TEESB)
Global environmental and other impacts
- Construction of nearly-zero energy buildings (NZEB) in direct greenhouse gas emission avoidance
- Replication after project's end (facilitated by updated energy building codes) resulting in indirect emission reduction
- Affordable and clean energy (SDG 7); Related job creation and skills enhancement (SDG 8); Industry, Innovation and Infrastructure (SDG 9); Sustainable cities and communities (SDG 11); Climate action (SDG 13)
Programme solution
Implementation of NZE (nearly-zero energy) options in residential apartment and public buildings facilitated by improved codes and strengthened (institutional) capacity and awareness
To support Turkmenistan's low carbon developm
achievement of climate mitigation goals by reducin
emissions from multi-family residential buildings sect
improved monitoring of energy use in public buil
1. Nearly-zero energy (NZE) options demonstrated (through advanced building envelope upgrades and renewables) with information systems installed and tested
2. NZEB construction design regulations proposed with strengthened institutional framework and enforcement policy
3. Strengthened and better-informed stakeholders on state-of-the-art construction in buildings and compliance with new building codes
4. Monit
and
evalua
1.1 Investment in nearly-zero energy (NZE) measure and information systems in public and multi-family residential pilot buildings
1.2 Energy performance of NZEB pilot buildings assessed and compared with reference buildings
1.3 Public investment strategy for NZEB-type high-rise construction (submitted for adoption before the end of the Project)
2.1 White papers prepared on the real cost of fossil fuel subsidies to the public budget and on cost-effective means of reducing energy consumption in the building sector
2.2 NZEB-compatible design criteria developed for buildings and current building codes updated
2.3 National NZEB plan [for Government consideration]
3.1 Life-cycle-cost assessment methodologies are introduced and operationalized
3.2 Increased capacity and knowledge of government officials and other stakeholders on NZEB construction planning, assessments, monitoring and evaluation
4.1 Mo
and
eval




*6. Change of the Main Implementing Partner of the Project*

During the PIF and PPG stages as well as by the time of the submission of the project package to the GEF in June, 2023 the Ministry of Agriculture and Environmental Protection (MAEP) was determined as the Implementing Partner for this project. However, on July 14, 2023, the Government of Turkmenistan has made a decision on separating the MAEP and establishment of two new ministries, the Ministry of Agriculture (MA) and the Ministry of Environmental Protection (MEP) of Turkmenistan. According to the relevant Presidential Decree (Decree of the President of Turkmenistan on the establishment of the Ministry of Agriculture of Turkmenistan and the Ministry of Environmental Protection of Turkmenistan) the newly formed Ministry of Environment Protection of Turkmenistan (MEP) has been designated as the legal successor for environmental protection of the MAEP. Consequently, in the capacity of a legal successor of the former MAEP, the Ministry of Environmental Protection of Turkmenistan is determined as the Implementing Partner for this Project.

*1) The baseline scenario and any associated baseline projects**[3]***[3]

The National Climate Change Strategy of Turkmenistan (adopted on 19 September 2019) considers energy efficiency, energy savings and the increased use of alternative energy sources as the main priorities of the policy oriented towards reduction of GHG emissions.

According to the Strategy, priorities for developing the housing and municipal services sector among others include: (i) Improving performance efficiency of municipal heating supply systems, (ii)

Improving regulatory framework for construction standards and rules towards ensuring energy efficiency and heating supply security of buildings; (iii) Promoting public awareness raising and motivation activities.

The Ministry of Construction and Architecture is implementing the Programme of Socio-Economic Development of Turkmenistan for the 2019-2025 period. This Programme outlines key strategic areas for sustainable development of the country in indicated period by investing among others in the construction of modern urban and rural developments with improved liveable conditions for residents and environmental considerations. Accordingly, the Government of Turkmenistan has ratcheted up residential construction. Significant funds are allocated to flagship projects, such as the construction of Arkadag (in Ahal *velayat*) and the Ashgabat City megaproject, situated north of the capital (see *Annex B* in the UNDP Project Document).

In such interventions, the Government is keen to show its achievements by building its infrastructure according to the latest technology requirements, including incorporating digital technology and NZE features. However, despite the intention, NZEB will not be realized on any significant scale if the before-mentioned barriers remain in place and the energy performance of buildings will continue to be according to the current (or even older) energy building codes and regulations.

The Government participated in the before-mentioned UNDP/GEF project ?Improving Energy Efficiency in the Residential Buildings Sector of Turkmenistan, EERB (2011-2018)?. A related project is ?Sustainable Cities in Turkmenistan: Integrated Green Urban Development in Ashgabat and Avaza? which has been instrumental in drafting relevant strategies and by-laws on energy efficiency, renewable energy, waste management. Other development partners, such as Asian Development Bank (ADB) and European Bank for Reconstruction and Development (EBRD) support or have supported several energy projects. As significant CO2 emissions reductions can be achieved by reducing energy losses in the electricity and gas networks and by tackling the venting of methane in fossil fuel production, these projects have focussed on supply-side (natural gas, renewable energy) rather than demand-side efficiency (such as building efficiency and energy use).

2*) The proposed alternative scenario with a description of outcomes and components of the project****[4]***[4]

The **project objective** is ?to support Turkmenistan?s low carbon development in the achievement of climate mitigation goals by reducing GHG emissions from multi-family residential (and public) buildings?. The TEESB project seeks to address the barriers and challenges to the introduction and dissemination of NZEB as a construction option using **four components of interventions** as described in the project?s Theory of Change diagram (see Exhibit 1).

Some smaller changes have been introduced as a consequence of the discussions with the project partners and stakeholders in the project design (PPG) phase in the list of outputs. These are summarized in Exhibit 2. The outputs of each component and their activities are described in detail below (corresponding to *section 4.1* of the UNDP Project Document). As compared to the PIF, an

attempt has been made to give shortage titles to the outputs, while listing activities under each Output provides the necessary detail.

### Exhibit 2 Comparison of project design at CEO endorsement and at the concept approval stage

| ProDoc / CEO ER | Project concept<br><br>(Project Indentification Form, PIF) | Rationale for Change in PIF Outputs/Activities in ProDoc |
|---|---|---|
| **Objective** | | |
| To support Turkmenistan?s low carbon development in the achievement of climate mitigation goals by reducing GHG emissions from multi-family residential (and public) buildings | To support Turkmenistan?s low carbon development in achievement of climate mitigation goals by reducing GHG emissions from multi-family residential buildings sector and by improved monitoring of energy use in public buildings. | There is no significant deviation, except that the goals and monitoring encompass both multi-family residential and office buildings |
| **Component 1 ? Piloting energy efficient technologies and EMIS in residential and public buildings** | | |

| ProDoc / CEO ER | Project concept<br><br>(Project Indentification Form, PIF) | Rationale for Change in PIF Outputs/Activities in ProDoc |
|---|---|---|
| 1.1 Investment in nearly-zero energy (NZE) measure and information systems in public and multi-family residential pilot buildings<br><br>1.2 Energy performance of NZEB pilot buildings assessed and compared with reference buildings<br><br>1.3 Public investment strategy for NZEB-type high-rise construction (submitted for adoption before the end of the Project) | 1.1 Investment in energy efficiency and energy savings measures in two public multi-family residential buildings of 9,532 sq.m. that are constructed in a new urban settlement (Administrative Centre of Ahal Province), featuring the best available envelope design towards NZEB<br><br>1.2. Investment in the energy management systems (EMIS) and related IT technologies in two pilot residential buildings and one public building with potential for expansion and replication following the end of the Project<br><br>1.3 Design of a 10-year public investment program (valued at $20 million for years 2026-2035) for new constructions under new building codes, adopted before the end of the Project | Outputs 1.2 and 1.2 (PIF) have been merged into one output 1.1 (ProDoc, where they appear as separate activities). Rather than having two pilot (residential) NZE buildings with 9532 m2 and EMIS in one office buildings, the choice has changed to one residential building pilots (with building automation system) and one office building (with EMIS) at a combined floor surface of 16,740 m2 (and occupied space of 11,582 m2. The new output 1.2 stresses the importance of having energy performance measurement and social-environmental assessments (SES) in the pilot and comparable baseline buildings. As the Ahal centre referred to may be largely built already by the time TEESB will effectively start, the project is likely to have pilot buildings in other urban developments.<br><br>Output 1.3 remains, as such and the strategy would have a plan for the first period (coinciding with last years of TEESB) in about 30 buildings (with corresponding *incremental* NZE investments of about USD 11 million, which are counted as contributing to TEESB?s direct GHG emission reduction |
| **Component 2 ? Policy, regulations and institutional mechanism for energy efficient buildings sector** | | |

| ProDoc / CEO ER | Project concept<br><br>(Project Indentification Form, PIF) | Rationale for Change in PIF Outputs/Activities in ProDoc |
|---|---|---|
| 2.1 White papers prepared on the real cost of fossil fuel subsidies to the public budget and on cost-effective means of reducing energy consumption in the building sector<br>2.2 NZEB-compatible design criteria developed for buildings and current building codes updated<br>2.3 National NZEB plan [for Government consideration) | 2.1 A white paper is prepared on the real cost of fossil fuel subsidies to the public budget and the national economy (including reduced GDP growth), with alternatives presented on direct cash subsidies to residents and other means of reducing the impact of phased-out fuel subsidies<br><br>2.2 Country-specific design criteria and standards are developed<br><br>2.3 An enforcement policy and associated legislations on Turkmenistan?s building code are developed<br><br>2.4 An institutional mechanism to regularly revise and update building energy performance standards is set up | Output 2.1 has been expanded to also include also white papers on cost-benefits and impacts of NZEB options and technologies.<br><br>Output 2.2 has not really changed, focusing on benchmarking and NZE norm formulation suited to Turkmenistan circumstances<br><br>Outputs 2.3 incorporates a plan for the introduction of NZE norms and regulations over time, including institutionalization (transferred from Output 3.3, PIF). |
| **Component 3 - Knowledge sharing and capacity building** | | |
| 3.1 Life-cycle-cost assessment methodologies are introduced<br><br>3.2 Increased capacity and knowledge of government officials and other stakeholders on NZEB construction planning, assessments, monitoring and evaluation | 3.1 The capacity of central and local government officials, and administrations is increased to conduct feasibility studies and to properly budget for compliant new buildings<br><br>3.2 Life-cycle-cost assessment methodologies are introduced and operationalized within the budget planning procedures of the relevant governmental organizations and their subsidiary design bureaus<br><br>3.3 Monitoring, reporting, and verification activities are institutionalized as part of a dedicated divisions of the relevant governmental organizations ($50,000).<br><br>3.4 Awareness of the construction companies and subcontractors that are providing materiel and equipment is improved ($100,000).<br><br>3.5 Knowledge of the building users on the new energy efficient technologies in buildings is improved ($20,000). | Output 3.1 corresponds to Output 3.2 (PIF). New activity added is on ?embodied emissions?.<br><br>Output 3.3 (PIF) has been split, with mandatory UNDP/GEF project M&E given its separate place as ?Component 4, M&E?, while the MRE/MVE institutionalization part has been incorporated as an activity in the ProDoc?s Output 2.3 (National NZEB plan) |

| ProDoc / CEO ER | Project concept<br><br>(Project Indentification Form, PIF) | Rationale for Change in PIF Outputs/Activities in ProDoc |
|---|---|---|
| **Component 4 ? Monitoring and evaluation** | | |
| 4.1 Mandatory monitoring, reporting and evaluation | 3.3 Monitoring, reporting, and verification activities are institutionalized as part of a dedicated divisions of the relevant governmental organizations | Difference has to be made between setting up a MVE (monitoring verification, enforcement) for (NZE) building codes in Turkmenistan government bodies *and* project-specific mandatory M&E activities. Hence, these are separated |

**Project Components, Outputs, Activities**

*Component 1 Piloting energy efficient technologies and EMIS in residential and public buildings*

| ***Outcome*** | ***Outputs*** |
|---|---|
| 1. Nearly-zero energy (NZE) options demonstrated (through advanced building envelope upgrades and renewables) with information systems installed and tested | 1.1 Investment in nearly-zero energy (NZE) measure and information systems in public and multi-family residential pilot buildings<br><br>1.2 Energy performance of NZEB pilot buildings assessed and compared with reference buildings |
| | 1.3 Public investment strategy for NZEB-type high-rise construction (submitted for adoption before the end of the Project) |

*Component overview*

**Component 1** of the project focuses on the demonstration of the costs involved and the energy efficiency gains to be achieved via the upgrade of the new buildings to a nearly zero-energy (NZE) standard to prove that such a standard is economically beneficial to the public budget during the lifetime of the measures and that the measures can be procured and installed locally. These NZEB pilots will serve as a real example of the proof of concept to raise enough government (and other) financing to scale up the construction of buildings based on NZEB concepts. The tested technologies will subsequently be proposed to be included as part of a new public investment program in the construction of NZEBs.

Apart from the construction cost of the building itself, project developers or owners will cover the additional cost of high-efficiency of the building fabric (supplemented with GEF incremental cost support). These can include (a) optimal insulation of the building envelope (roof, walls, basement), (b) energy-efficient windows, (c) use of efficient boilers and chillers, as well as (d) grey water recycling and re-use, (e) building automation (BAS), heat control (AHC) and other elements of energy information

systems (EMIS), (f) heat recovery and adequate measures in ventilation, (g) replace natural gas (for hot water and space heating) by using solar thermal and ground source heat pumps, and (h) the latter, powered by solar PV. GEF incremental support may focus on improvements that are not an integral part of the building structure as such (e.g. thicker wall insulation), but technology that can be added, such as renewable energy (solar PV) or heat recovery in ventilation). However, the exact distribution of investment costs over GEF and exact co-financing amount will be decided in the detailed design and business plan of each pilot building, but with the understanding that the total GEF INV for the pilot buildings will not exceed USD 750,000.

As part of the technical assistance, GEF will support adding NZEB elements into the construction feasibility and detailed design studies that, apart from the above-mentioned technology options may include passive building elements, such as (1) optimal wall-to-window ratios in the building; (2) optimized use of daylight and adequate measures to utilize sunlight while maintaining indoor comfort; (3) and other measures (such as shading and improved siting) that consider the relationship between cooling needs and building performance.

The Ministry of Energy will lead the coordination of the implementation of Component 1 on a technical level with UNDP Country Office (CO) support in close collaboration with the Ministry of Construction and Architecture of Turkmenistan.

**Output 1.1 Investment in nearly-zero energy (NZE) option in public and multi-family residential pilot buildings with EMIS installed and tested**

In line with the ?smart city? idea of new developments in Turkmenistan (such as Arkadag and Ashagabat City) the buildings will come with automatic heat control (AHC) and building automation systems (BAS), while consumption of energy and water in apartments will be metered. In addition, the public buildings will have a more advanced energy information system (EMIS) with fault diagnostic and other IT tools added. Apart from optimizing energy consumption, these information systems will help vital real-time data on the actual energy consumption of the new buildings to enable comparisons with non-NZEBs. Thus, energy measurements and audits will be carried out in reference (non-NZE) residential buildings, two for each of the NZEB pilot (of which one in the same block heated by the same boiler system as the NZEB pilot building, and one in another boiler block) and two non-NZEB office building (that are similar in design and building characteristics).

The project will invest funds in the NZEB-type design and construction of two pilot buildings with a total footage[5]5 of 16,740 m2 (of which 11,852 m2 of occupied space with a) improved energy performance of the building envelope (e.g., high-efficiency and thicker insulation materials in walls, floors and basement, and triple-glazed windows), b) addition of renewable energy generation (via piloting installation solar PV roof-top panels and solar thermal added to the boiler system for pre-heating and hot water use), and c) other green features, such as grey water recycling and use. The approach involves early discussions between the builders, the architects, and heating and cooling engineers to ensure that energy systems can run at an optimal capacity while reflecting construction fabric energy savings (i.e. resulting in using modern heat pumps replacing boilers-chillers in conventional

construction). For a description of the location of the pilot buildings, please refer to Annex B (Box 17 and Box 18), while details on NZEB energy-saving and substitution options are explained in Annex F.

At project inception, the sites for the NZEB pilots will be selected (in accordance with the progress in the realization of the Arkadag, Ashgabat city or other urban development projects). The technology demonstrations will represent major advancement (that is, beyond the requirements of current energy-relevant building codes) towards achieving NZEB compliance (showcasing the best available options in building energy efficiency and renewable energy), and ideally, should be introduced in the design of new buildings (rather than added afterwards to already detailed building construction and energy management designs).

Adding to the overall baseline architecture and design of the buildings, feasibility studies of the proposed NZEB interventions in the pre-selected pilot buildings will be carried out and finalized, including comprehensive technical and economic evaluations for the recommended NZEB options. The feasibility analyses will then be reviewed, subject to co-financing commitments by the envisaged partners (Ministry of Construction and Architecture, Ministry of Energy), and then finalized with the recommended NZEB options and final selection of the pilot buildings.

Thereafter, detailed engineering designs with technical specifications will be conducted with support from the Project (GEF TA) and the building developers/owners in which the best available NZEB options and technologies will be considered with technical and economic justifications. The agreed NZEB options will be incorporated into the overall building design and its heating and cooling system for which a business plan will be prepared (that indicates responsibilities of partners, financing and timeline with milestones). The plan will also indicate how (energy) technology providers will be selected transparently and competitively.

The next step is securing the necessary permits, apart from the construction itself, permits for using new construction materials and NZEB technologies (in particular, if these are new, such as putting PV on rooftops). This will be followed by the drafting of the technical specifications for the tender for the design, engineering, supply of materials and implementation of specific EE features in selected demonstration buildings, followed by the construction of the building. All NZEB options and technologies implemented in the pilot building will be done either by the construction company contracted by the Government for constructing the buildings (subject to UNDP procurement policies and standards) or through the UNDP competitive procurement/tendering processes. This will be determined during the first year of the project implementation based on renewed assessment of implementing partner?s procurement capacities (PCAT) and UNDP?s rules and regulations.

It should be noted that the GEF investment support (INV) funds for the two buildings will be incremental cost, that is for NZEB improvements (as outlined earlier and detailed in Annex F) in addition to the construction cost of the buildings (according to conventional designs and following current energy performance building codes, approved in 2020). An amount of USD 750,000 is available (plus USD 15,000 for installing measurement and monitoring equipment, see Output 1.2). The exact level of GEF-funded subsidy and its delivery mechanism will be determined during the first year of the project implementation based on technical and financial analyses of the NZEB design and architecture, performed by third-party experts, based on principles of additionality, minimum concessionally and

incremental cost. Third-party experts will also independently verify that the total investment cost used for the building to which the GEF-funding will be applied reflects rational cost. The project will use direct payments, or performance-based-payments (PBP) or potentially other methods for the GEF incremental investment. The appropriate mechanism will be identified during the first year of the project based on feasibility studies, national legislation, and the Government procurement system as well as UNDP?s rules and regulations.

Lessons learnt from the pilot buildings will be used to scale up the system in the Ashgabat City programme and elsewhere in Turkmenistan (see Output 1.2). Also, the piloting activities will create ?learning-by-doing? capacity-building opportunities for technical and Government staff that will be working on the system (see Outputs 2.2 and 2.3). The activity includes ongoing documentation of the design and renovation approach, including detailed plans and lessons learned. After the construction, the Project will introduce the NZEB technologies to the occupants of the new buildings as well as to facility managers of the office buildings.

*Pilots and Social and Environmental Safeguards Planning (SESP)*

The NZEB demonstration in pilot buildings funded by GEF INV is required to comply with all the relevant national standards of the country as well as UNDP standards on social and environmental safeguards, gender equity and stakeholder consultation. In support of this, specific guidance and inputs have been developed for the program on SES as well as a Gender Action Plan and Stakeholder Engagement Plan which will accompany this Project Document (see Annex J and Annex K).

The guidance outlined in the SESP will be incorporated and considered in developing the environmental and social impact assessments and management plans for pilot/demonstration projects. One way to ensure a gender balance is to thrive for at least a 25-35% participation of women, who should be involved at various levels of the pilots/demos (decision-making, administrative-financial, operational). A limited ESIA will also be carried out to ensure that issues (such as labour conditions and gender aspects) are planned for. A Code of Conduct will guide conduct in various contexts including governance, accountability, project design and demonstration project execution in ways that address gender needs as well as issues identified in the SESP relating to stakeholder engagement, beneficiary engagement, gender and human rights, local environmental issues and the overall management of risks.

| *Activities ? Output 1.1* | *Deliverables* |
|---|---|
| 1.1.1 Identification of sites and pilot buildings<br><br>1.1.2 Feasibility analysis and detailed design of pilot project interventions<br><br>1.1.3 Installation of NZEB options (as part of the construction of the new building) | 1.1A. Design study and feasibility analysis of NZEB additions in residential apartment buildings<br><br>1.1B. Design study and feasibility of NZEB additions in high-rise office/public buildings; one seminar presenting feasibility<br><br>1.1C. Tender documents for construction with NZEB options specified<br><br>1.1D. Application of NZEB measures, including automation and/or EMIS features in Project pilot buildings (one residential apartments and one office/public building) with further |

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|---|---|
| | applications in all new buildings once relevant building codes are upgraded and adopted.<br><br>1.1E. Progress reporting on installation of NZEB interventions in pilot buildings. |

**Output 1.2 Energy performance of NZEB pilot buildings assessed and compared with reference buildings**

Activities include the monitoring and evaluation of building performance (consumption of heat, gas, water and power) to estimate the building energy savings. To be able to estimate energy and GHG savings in the pilot buildings these need to be compared to a baseline. The baseline performance will be based on the energy performance measurement in reference buildings (formed by new buildings constructed in the same city development project but without the NZEB features of the pilot buildings). These will include two residential apartment buildings per residential pilot (one located in the block, heated by the same boiler facility; and another in another block), thus three in total; as well as one public building (similar to each of the pilot NZEBs)[6][6].

Two case studies will be prepared; one for residential buildings and one for the pilot office buildings. The case studies will cover the technical aspects of the NZEB interventions and energy savings, and compare them with the results of similar NZEB implementations in other countries.

| *Activities ? Output 1.2* | *Deliverables* |
|---|---|

| | |
|---|---|
| 1.2.1 Energy performance measurements in pilot and reference buildings<br><br>1.2.2 Case studies and information dissemination | 1.2A. Report with measurement of energy performance and energy audits in reference buildings<br><br>1.2B. Summary case studies (02)<br><br>1.2C. Seminar with a presentation of results of pilots and case studies |

**Output 1.3 Public investment strategy for new NZEB-type of building construction**[7]7
**[submitted to the Government for adoption before the end of the Project]**

The Project will assist the Government to develop a suitable NZEB public investment strategy. The program preparation process will feature new procedures, such as feasibility studies justifying longer pay-back horizons by taking into account all building life-cycle costs including energy costs (see Output 3.1) and the techno-economic assessment of NZEB options (Output 2.1). Based on these assessments, as well as the results of the NZEB pilots (monitored and documented energy and monetary savings and GHG reduction), an assessment will be carried out on the viability and inclusion of NZEB options in building design for replication. The assessment will incorporate the results of interviews will be held with government stakeholders and discussions with practising architects, energy efficiency specialists and private and public building developers. Based on comments and feedback, the assessment will result in a set of design recommendations (design protocols) for replication.

Based on the design protocols, an investment strategy for NZEB buildings (in Ashgabat City and/or other urban residential and building projects in the country) will be drafted and discussed with all relevant stakeholders. The activity involves the presentation of the investment plan to the management of relevant government stakeholders (Ministries, Turkmengaz, and others) and the process for endorsement by the envisaged co-financing entities, the Ministry of Construction and Architecture and the Ministry of Energy.

| *Activities ? Output 1.3* | *Deliverables* |
|---|---|
| 1.3.1 Development of guidelines (for IT and NZEB options and applications, following proposed NZEB code updates) for the design of a range of residential apartment and office buildings | 1.3A Report with assessment and recommendations of protocol for incorporating NZEB features (higher energy performance and renewable energy; passive design) for planned apartment and public building |

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|---|---|
| 1.3.2 Development, review and submission for endorsement of a NZEB investment strategy by relevant Ministries | 1.3B Investment strategy for buildings in Ashgabat and other urban developments submitted to the Government of Turkmenistan<br><br>1.3C Seminar/workshops (02) on NZEB plans and investment strategy |

*Component 2 Policy, regulations and institutional mechanism for energy efficient buildings sector*

| ***Outcome*** | ***Outputs*** |
|---|---|
| 2. NZEB construction design regulations proposed with strengthened institutional framework and enforcement policy | 2.1 White papers prepared on the real cost of fossil fuel subsidies to the public budget and on cost-effective means of reducing energy consumption in the building sector<br><br>2.2 NZEB-compatible design criteria developed for buildings and current building codes updated<br><br>2.3 National NZEB plan [for Government consideration) |

**Component Strategy/Context**

The designed TEESB will be built on the success of the previous UNDP-GEF EERB which laid a foundation for updated EE building codes (approved in 2020) in Turkmenistan. Component 2 of the Project aims to define and put into operation the necessary policy improvements, standards and regulations as well as an institutional mechanism to scale up energy efficiency in new buildings towards NZEB levels. Incremental GEF assistance is required for detailed assessment and facilitating the adoption of institutional arrangements.

The coordination of the implementation of this component on a technical level will be carried out directly by the Ministry of Construction and Architecture of Turkmenistan with UNDP Country Office (CO) support.

**Output 2.1 White papers prepared on the real cost of fossil fuel subsidies to the public budget and on cost-effective means of reducing energy consumption in the building sector**

The project will produce two white papers for the Government of Turkmenistan. One white paper will include an assessment of the costs of current policies to the national budget and economy (including impact on GDP growth) with a list of alternatives to repurpose direct cash subsidies to residents and other means of reducing the impact of phased-out fuel subsidies. The White Paper will detail the results of similar policy steps across the globe and present conclusions and a step-by-step guide, including draft regulations to effectuate a transition to a zero-subsidy regime for fossil fuels and for more cost-effective electricity tariffs. The white paper will also define a public outreach plan and stakeholder engagement approach to support the Government?s transition toward cost-reflective energy pricing.

Based on the results of Output 1.1, incorporating the results of activity 2.2.1 as well as the assessments of Output 2.3, the study will identify and quantify cost-saving options in the existing and new housing stock, including a discussion of these options based on energy savings or substitution potential cost-effectiveness, payback period, and applicability in Turkmenistan. Furthermore, the study will include global environmental impacts (GHG emission reduction or avoidance) as well as development impacts (non-energy benefits such as employment secured, costs saved, income generated, and gender aspects, to name a few).

Only the latest buildings comply with the 2020 energy building codes, thus, most existing buildings are highly inefficient, driving up cities? emissions and energy costs. These buildings will still stand for decades. Many of those buildings fall short of the 2020 energy building standards, let alone NZEB-type performance. In the long run, also existing buildings will need to move to higher efficiency. The EERB project carried out energy audits of energy performance and estimates of the impact of energy performance for various sizes and types of buildings, resulting in an assessment of potential energy savings of modernization of residential building stock. Based on building stock statistics and EERB project results, a sector assessment will be carried out on building characteristics, energy consumption and projections for the coming three decades in scenarios, assuming different levels of penetration of new buildings (according to 2020 SNT building codes and new NZEB standards). Energy surveys with basic audits in selected buildings will be conducted to validate the information. The assessment will include recommendations for policy actions to bring older buildings at least towards the level of current codes or even set towards a net-zero pathway.

| *Activities ? Output 2.1* | *Deliverables* |
|---|---|
| 2.1.1 White paper on the real cost of fossil fuel subsidies to the public budget and national economy<br><br>2.1.2 White paper on the costs-benefits and impacts of NZEB technologies to reducing energy consumption or substitute fossil fuels in the residential and public building sector | 2.1A White paper on the cost of fossil fuel subsidies<br><br>2.1B Overview of energy savings and renewable technologies in buildings applied in Europe or elsewhere<br><br>2.1C Study report on the potential for energy savings in existing buildings undergoing capital renovation (i.e. significant remodelling and refurbishment) and higher-energy performance. |

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|---|---|
| 2.1.3 Assessment of the potential of improving energy efficiency in existing buildings | 2.1D White paper on the costs-benefits and impacts of NZEB technologies in Turkmenistan<br><br>2.D Seminars/workshop (02) presenting white papers and options on NZEB application in Turkmenistan |

**Output 2.2 NZEB-compatible design criteria developed for buildings and current building codes updated**

The Project will produce the packages of relevant normative documentation (construction standards, amendments to laws and bylaws) to transpose the tested technologies in both the regulations concerning the modernization of existing buildings and improving climate footprint and resilience of new buildings. The Project will assist the Government in the adoption of state-of-the-art energy-efficiency design requirements (aiming at the level achieved by NZEB norms) for new residential buildings aimed to achieve significant construction and lifecycle cost reductions. For this, the project will support the development of those new design criteria and standards.

First, an overview will be made of NZEB on building code development, best practices, and trends in the CIS and the EU. The same report will present an overview of energy-saving opportunities for both heating, ventilation and cooling options, passive building design and application of renewable energy for realizing them based on internationally-acknowledged good practice.

Information on future building plans will be analysed (type, size, characteristics, location, etc.) and future energy consumption will be assessed and calculated, assuming NZEB-type of design protocols (see activity 1.2.1) will be adhered to. The concept of energy passports (introduced as part of the EERB project, see Box 22 in Annex G) will be updated, published in a brochure and disseminated to

stakeholders in seminars and workshops (policymakers, enforcement officials, private sector, developers).

The Project will assist the Government of Turkmenistan in justifying that such a standard is economically beneficial to the public budget. Based on the results of the pilots, the international experiences and the NZEB options report of activity 2.3.1 (and in coordination with activity 2.2.2: white paper on cost and benefits of NZEB options), the current energy-relevant building codes (for new buildings) will be updated towards NZEB achievements. The energy building codes (for newly constructed buildings) are expected to be presented to the relevant stakeholders for review and feedback and then submitted to the Government for adoption by the last year of the TEESB project.

The Project will also enhance the capacity of the Ministry of Environmental Protection, Ministry of Energy, and Ministry of Construction and Architecture of Turkmenistan and specialists from the *khyakimliks* of *velayats* and *etraps* (municipalities of provinces and districts) on conducting an expert assessment of energy efficient houses to ensure compliance with new norms and standards (SNT) and minimum energy consumption requirements in the buildings sector. The Project will also work with the national government as well as the administrations of selected municipalities of Turkmenistan to align their long-term building construction and modernization plans to ensure continuity of the tried-and-tested construction/reconstruction technological approaches.

| *Activities ? Output 2.2* | *Deliverables* |
|---|---|
| 2.2.1 Compilation report on NZEB-type of building codes development and best NZEB practices in EU and CIS states<br><br>2.2.2 Definition of benchmarks for categories of buildings per climatic zone and updated energy passports<br><br>2.2.3 Development and presentation of NZEB codes to Ministry of Construction and Architecture | 2.2A Report on NZEB initiatives and plans in EU and neighbouring countries<br><br>2.2B Report with upgraded benchmarks for categories of buildings per climatic zone and formulation of building energy passports.<br><br>2.2C Recommended package of updated or expanded energy codes[8]8 submitted to the Ministry<br><br>2.2D Seminars and workshops (03) on NZEB practices, experiences in other countries and proposed NZEB-relevant updating of building codes in Turkmenistan |

**Output 2.3 National NZEB plan with enforcement and verification of Turkmenistan?s building code**

The Project will further assist the Government to set up an institutional mechanism to revise and update building energy performance standards regularly in line with regional and international best practices. The Project will design a ?national action plan? for the introduction of the NZEB-type new building codes. GEF support is requested to develop such a plan for the introduction of new NZEB codes and for setting up and expanding work of the building energy performance MRV structure (see activity 2.3.1). Apart from building codes for new buildings, the plan will also consider the introduction over time of more stringent requirements for the energy performance of groups of existing buildings (based on the assessment of activity 2.1.2) over time (so that all of the building stock will have moved in one way or another towards higher energy performance).

The ?action plan? will feature a description of the mandate of a new building code monitoring, verification and enforcement (MVE) division within the Ministry of Construction and Architecture. Currently, different departments of the Ministry are in charge of monitoring compliance with a variety of building code provisions making it difficult to evaluate the effectiveness of the building code and benchmarks set.

The description of the organizational structure of the MVE system will be elaborated and consider (a) governing structure, the entities involved and their respective roles and responsibilities; and (b) key institutions and entities responsible for administering and enforcing any included regulatory initiatives. The Project can assist the Government in the development of an appropriate institutional structure[9]9 and roadmap recommendations for a such MRV.

| *Activities ? Output 2.3* | *Deliverables* |
|---|---|
| 2.3.1 Support for setting up a MRV unit as part of a dedicated organizational structure of the Ministry of Construction and Architecture<br><br>2.3.2 National action plan for the introduction of new NZEB-type building codes | 2.3A Plan for setting up appropriate unit/structure and for the upgrading of the bylaws, monitoring and regulations along with the enforcement routines.<br><br>2.3b Developed action plan (with budget allocation and milestones; governance setup) for upgrading current building codes |

| | |
|---|---|
| | 2.3C Seminar/workshops for discussion and presentation of the above action plan (02) |

*Component 3 Knowledge sharing and capacity building*

| ***Outcome*** | ***Outputs*** |
|---|---|
| 3. Strengthened and better-informed stakeholders on state-of-the-art construction in buildings and compliance with new building codes | 3.1 Life-cycle-cost assessment methodologies are introduced<br><br>3.2 Increased capacity and knowledge of government officials and other stakeholders on NZEB construction planning, assessments, monitoring and evaluation |

**Component Strategy/Context**

Component 3 of the project is structured around capacity building, knowledge management and monitoring. It will target government staff, building owners and users by sharing knowledge with them on the new technologies they will have to deal with in the coming years. The technical coordination of the implementation of Component 3 will be jointly conducted by the Ministry of Construction and Architecture, the Ministry of Energy and the Ministry of Environmental Protection of Turkmenistan with UNDP Country Office support.

GEF funding will also support the capacity development of current and future architects and building engineers on the latest in nearly-zero energy or net-carbon building. At the government level (both local and national), awareness of NZEB norms and construction and building design options is low, while there is a lack of access to the latest information and knowledge. Thus, GEF support is needed to provide capacity building and training, in combination with a study tour abroad to observe best practices and national NZEB programmes. GEF will also fund the development and dissemination of all lessons learned.

**Output 3.1 Lifecycle cost and carbon assessment methodologies are introduced**

Output 3.1 will be equipping the Government with accessible life-cycle-costing methodologies and case studies, documenting new experiences and lessons learned into targeted messages disseminated to

relevant divisions of the Ministry of Construction and Architecture. This will be done through multiple knowledge management platforms, including web-based communication channels, newsletters, lesson notes, case studies, and workshops. The lifecycle assessment methodologies are operationalized within the budget planning procedures of the relevant governmental organizations and their subsidiary design bureaus.

The analysis will also look at ?embodied emissions? and options for cleaner construction (i.e., approaches to improve resource efficiency and reduce emissions in the construction industry). Embodied emissions come from the extraction, manufacturing, transport, construction, maintenance, and of materials used in construction[10]10. For example, common construction materials, such as concrete and steel, are high in carbon. The production of cement, a key ingredient in concrete, is alone responsible for 8% of all global $CO_2$ emissions and also consumes vast amounts of water, as well as sand and gravel. The activity will make an assessment and study of the market to identify building materials and options for cleaner construction materials.

| *Activities ? Output 3.1* | *Deliverables* |
|---|---|
| 3.1.1 Life-cycle-cost assessment methodologies are introduced within the budget planning procedures of the relevant governmental organizations<br><br>3.1.2 Embodied emissions assessment | 3.1A Report on applying lifecycle cost assessment and methodologies in public budget and procurement<br><br>3.1B Paper on embodied emissions<br><br>3.1C Presentation of results (seminar/workshop) |

**Output 3.2 Increased capacity and knowledge of government officials and other stakeholders on NZEB construction planning, assessments, monitoring and evaluation**

The project will conduct a capacity assessment of relevant practitioners, including technical personnel working with building developers, contractors, EE technology suppliers, staff of ministries and government agencies, energy auditors as well as local technical individuals (engineers, building designers, architects, etc). Based on the needs assessment, three training packages will be designed for practitioners.

Output 3.2 will specifically address the government's capacity to assess building projects in the area of new construction and energy efficiency. Officers of the Ministry of Environmental Protection and the

Ministry of Construction and Architecture will be trained to prepare economic assessments and feasibility analyses for several building types on lifecycle considerations. The staff of the Ministry of Environmental Protection, the Ministry of Construction and Architecture, and city administrations will also be trained to better understand procurement of the relevant materials and equipment based on lifecycle rather than least investment cost considerations. A preferred modality will be ?training-of- trainers? to ensure that after the project is over, new staff of the relevant expert and oversight bodies will have human resources to tap into to bring the staff knowledge levels up to the required level of technical expertise[11][11].

One activity will be the organisation of a study tour to neighbouring countries or Europe to have decision-makers (from government, lead architects and engineers from selected institutes as well as business leaders) exposed to NZEB model buildings and design and implementation of NZEB regulations and advances in NZEB technologies. The destination countries and host organizations will be determined by screening during the implementation phase. The modality of the tours is flexible (with the possibility of virtual events if travel would be restricted).

The output aims at improving the awareness of business owners and leaders. The Project will provide building developers, facility managers, and business owners of the businesses training on techno-economic aspects (e.g., life-cycle cost benefits and return on investment in EE buildings) as well as the relevant legal and regulatory aspects for successful implementation of NZEB programs.).

Another activity will involve the development and introduction of curricula for students of architecture and construction engineering, including updating training materials on NZEB (materials, design, integration of renewable energy, passive solar design, green buildings and water use, etc.) and the packaging of training for the use in post-secondary academic curricula. This will require the training of staff and faculty members along with the preparation of relevant course materials for students.

The knowledge generated from the MRV component will be used for awareness and advocacy for policymakers to showcase the benefits of NZEBs. Awareness activities will include concise but complete information on NZEB and space temperature handling to the prospective apartment occupants and office manager to avoid ?rebound effects? (see risk 3 in the table in Box 13). Various case studies will be prepared including the two NZEB pilot building case studies (see Output 1.2) as well as an info-document on NZEB constructions and socio-economic and environmental impacts. Another activity will help disseminate information to the potential apartment dwellers about the peculiarities of living in NZE buildings. At the end of the Project, a comprehensive end-of-project assessment and lessons learned study will be commissioned (from UNDP co-financing) with detailed recommendations for post-TEESB action. The Project will support the development of a final report? as well as an ?insight brief? capturing (in an accessible format) selected key highlights from the pilot/demo or other successful national project activity as an easy-to-read summary that can cover any activity of the project and take the form of a written brief or video brief.

| *Activities ? Output 3.2* | *Deliverables* |
|---|---|
| 3.2.1 Conduct need assessment and design of capacity development programs on NZEB | 3.2A Needs assessment survey with capacity building recommendations (per target group) in a final report |

| | |
|---|---|
| 3.2.2 Capacity strengthening of central and local government officials, and administrations to conduct feasibility studies and to properly budget for compliant new buildings<br><br>3.2.3 International exchange of knowledge and experiences<br><br>3.2.4 Knowledge enhancement of construction companies and subcontractors that are providing materiel and equipment<br><br>3.2.5 Training of architects, engineers and students in the fields of architecture and engineering trained on NZEB, in particular, integration of renewable energy and passive solar design<br><br>3.2.6 General knowledge management and information dissemination | 3.2B Organization and delivery of training for officers of the Ministry of Construction and Architecture, Ahal district, and Ashgabat city administration will be trained in the data collection, preparation of feasibility study assessments, and execution of the monitoring and verification work.<br><br>3.2C Study tour organized, completed and reporting carried out<br><br>3.2D Training of architects, engineers and students in the fields of architecture and engineering trained on NZEB, in particular, integration of renewable energy and passive solar design<br><br>3.2E Organization and delivery of training over employees from at least 20 private-sector companies will be trained in the identification of opportunities related to energy efficiency, production, installation, and service of energy-efficient building technologies and IT systems, with at least 35% of them being women.<br><br>3.2F Course and guidance materials for training delivery<br><br>3.2G KM products (project final report, ?insight? report with selected case studies; high-level policymakers? brief; lessons learned material<br><br>3.2H Workshops and seminars (03) on international experiences, lessons learned and results of TEESB project |

**Exhibit 3 Pilots buildings, NZE building codes and direct GHG emission reduction**

Annex F describes the project?s target contributions to GEF-7 Core Indicators as updated at CEO ER formulation (PPG) stage, and compares them to those expected at the PIF phase. The **direct emission** reduction is based on the following:

- Construction of one residential apartment building and one office building as GEF-supported pilots. Apartment buildings and office buildings may vary widely (from 3 to 16 floors) and floor space area. The case of a building with 30 residential apartments on 4 floors with a combined floor space of 5,308 m2 and total floor space of 8,100 m2 (incl, basement and attic) and an office building (with an office floor space of 6,544 m2 on 5 floors; total floor space 8,640 m2) has been taken as the basis for energy savings and GHG emission reduction calculations resulting from adding NZEB options to the reference building (i.e., assuming to be built in accordance with current codes and without solar energy added). The emission reduction of the two pilot buildings is 5,284 tCO2? over the building?s energy intervention?s lifetime (of 20 years) with avoided natural gas consumption (avoided direct use and use for avoided power generation) of 26,688 MWh over the project?s lifetime). The details of the calculation, methodology and assumptions are provided in Annex G.

- New NZEB-oriented building codes will only be drafted towards the end of the project and, some will be officially approved by the project?s end. Even if still in draft form, it is assumed that some new buildings will be built by the end of the project in accordance with a proposed NZEB investment strategy and following the NZEB codes. It is estimated that (apart from the two pilots) a total of 210,600 m2 of residential and 51,840 m2 of office floor space will be constructed or with investments approved according to NZE practices [1]. These are substantial figures but not unrealistic to assume, given the fact that the Government often wants to showcase new urban developments as ?high-technology? (see description of Arkadag and new Ashgabat City megaprojects in the main text of the Project Document), including constructing new buildings will be built according to NZEB norms and with digital technology features (by the two co-financing partners, Ministry of Energy and Ministry of Construction and Architecture, as well as other government entities). Therefore, as was also assumed in the PIF, the contribution of this NZE floor space built or approved by the end of the project is counted as contributing to the direct emission reduction (81,627 tCO2 in total, with corresponding natural gas avoidance of 412,258 MWh)

| | | Total floor space ($m^2$) | Number buildings | Cumulative $tCO_2$ | Cum. energy reduction | EE savings MWh gas | RI M |
|---|---|---|---|---|---|---|---|
| Pilot bldngs. | Residential | 8,100 | 1 | 2,496 | 12,606 | 7,140 | |
| | Office | 8,640 | 1 | 2,788 | 14,082 | 10,272 | |
| | Measuring | | | | | | |
| | *Subtotal* | *16,740* | *2* | *5,284* | *26,688* | *17,412* | |
| Bldng codes | Residential | 210,600 | 26 | 64,898 | 327,767 | 185,641 | 1 |
| | | 51,840 | 6 | 16,729 | 84,491 | 61,632 | 2 |
| | *Subtotal* | *262,440* | *32* | *81,627* | *412,258* | *247,273* | *1* |
| **Direct emission and energy reduction** (over lifetime = 20 yrs) | | | **tCO2** | **86,911** | **438,947** 1,580,208 | MWh (gas) GJ | |
| | | | Electricity savings | | 16,805 | $MWh_e$ | |
| | | | Nat. gas savings (direct) | | 380,128 | $MWH_{th}$ | |

*Component 4 Monitoring and evaluation*

| *Outcome* | *Outputs* |
|---|---|
| 4. Monitoring and evaluation | 4.1 Mandatory monitoring, reporting and evaluation |

This Component will ensure compliance with all mandatory monitoring and reporting requirements of the GEF, including the following specific outputs (described in more detail in Section 6). The Project will assist the GOB in establishing project oversight and monitoring systems, the Gender Action Plan (GAP), the Mid-Term Review (MTR), and the GEF Terminal Evaluation (TE). The MTR and the TE will consider gender as part of the evaluation criteria in keeping with GEF and UNDP guidelines. Awareness and knowledge of government staff and practitioners on NZEB options and issues will be enhanced. This will be assessed and measured in a survey assessed towards the end of the project, including gender and social inclusion aspects).

*3) Alignment with GEF focal area and/or impact program strategies;*

The program is aligned with Objective 1 of the Climate Change Focal Area to ?Promote innovation and technology transfer for sustainable energy breakthroughs?, principally through CCM 1-3 ?Promote innovation and technology transfer for sustainable energy breakthroughs for accelerating energy efficiency adoption?. Given the fact that solar PV will address a NZEB?s residual energy consumption (after introducing of energy rationalization features). TEESB has also links with CCM 1-1 ?Promote innovation and technology transfer for sustainable energy breakthroughs for de-centralized renewable power with energy storage?. Although submitted as part of GEF-7, TEESB can be aligned with the GEF-8 Sustainable Cities (Integrated programme) as well as with the CCM?s ?Pillar I: Promote innovation, technology development and transfer, and enabling policies for mitigation options with systemic impacts? (accelerate the efficient use of energy and materials).

4) *Incremental cost reasoning*

The Government of Turkmenistan will continue to face several challenges including: (1) Lack of planning, legal and regulatory framework that are supportive of comprehensive building initiatives that would be in line with best global NZE (nearly zero energy or nearly zero carbon) practices, (2) Limited institutional capability to facilitate buildings energy efficiency programs implementation and follow up, (3) Limited implemented NZEB projects and programs and absence of monitoring and verification of the impact of NZE measures (and EE in general), (4) Low public and professionals awareness on NZE initiatives applications and programs; and, (5) Lack of capability from national public and private sector to implement NZE/EE projects, and/or provide related services.

TEESB will contribute to the development of an energy-efficient construction sector in Turkmenistan that is environmentally sustainable and supports the country?s low-carbon development and climate mitigation plans, by focusing on net-zero buildings:

*1. Piloting energy efficient technologies and EMIS in residential and public buildings*

The project will demonstrate these NZEB options and technologies in public multi-family residential buildings which will provide capacity-building options to government organizations (see Component 3) and also will create the baseline for the desired standards and regulations to upgrade

the current energy-relevant building codes for Turkmenistan (addressed in Component 2). Demonstrating state-of-the-art EE technologies and practices in (larger) public and multi-family residential buildings will provide capacity-building options to government organizations and also will create a new baseline for the desired standards and regulations for Turkmenistan. By the end of the project, it is assumed that the Ministry of Environmental Protection, the Ministry of Construction and Architecture together with the Ministry of Energy and Ashgabat City Municipality will initiate the replication of the innovative solutions according to an investment strategy of NZEB-type.

2. *Policy, regulations and institutional mechanism for energy efficient buildings sector*

In order to assist the Government to rethink the fuel subsidization policy (which is adopted by presidential decrees), the Project will produce a White Paper on fossil fuel subsidization and power tariffs that will argue for the beneficial economic and political nature of a 10-year phase-out of fuel subsidies. The Project will commission a study on cost-saving options in the existing and new housing stock, including a discussion of these options based on energy savings or substitution potential cost-effectiveness, payback period, and applicability in Turkmenistan.

NZEBs are highly efficient buildings with extremely low energy demand, which is met by renewable energy sources. Such buildings produce as much energy as they consume, accounted for annually. To achieve their nearly zero energy goals, NZEBs first sharply reduce energy demand using energy-efficient technologies. This means the building codes need to be further revised to achieve reductions relative to the standards currently in place and then utilize renewable energy sources (RES) to meet the residual demand to approach carbon neutrality.

Based on the results of the pilots, analysis of the international experiences and NZEB options and the white papers on energy subvention and on the cost and benefits of NZEB options, the current energy-relevant building codes (for new buildings) will be updated towards NZEB achievements. The building codes (for newly constructed buildings) are expected to be proposed for government consideration in the last year of the TEESB project.

The Project will design a ?national action plan? for the introduction of the NZEB-type new building codes. The Project will also make recommendations for strengthening relevant existing (or creation of new) oversight bodies within the current ministerial setup that can revise and update building energy performance standards regularly in line with regional and international best practices. The description of the organizational structure of the MVE system will be elaborated and consider (a) governing structure, the entities involved and their respective roles and responsibilities; and (b) key institutions and entities responsible for administering and enforcing any included regulatory initiatives

3. *Enhanced knowledge sharing and increased capacity*

The project will demonstrate that the incremental costs are minuscule in net-resent-value (NPV) terms over the lifetime of the buildings (even at the tariff inflation scenarios that the Government is currently entertaining), using accessible life-cycle-costing methodologies and case studies.

Government staff (of the Ministry of Environmental Protection, the Ministry of Construction and Architecture, and selected municipalities) will be trained to prepare economic assessments and feasibility analyses for several building types using these methodologies and to better understand and implement updated regulations for procurement of the relevant materials and equipment.

Similarly, the Project aims at improving the awareness of the business owners and leaders through training and info on techno-economic aspects and relevant legal and regulatory aspects for successful implementation of NZEB programs. Other activities will involve the development and introduction of curricula for students of architecture and construction engineering, including updating training materials on NZEB (materials, design, integration of renewable energy, passive solar design, green buildings concepts and sustainable water use, etc.) and the packaging of training for the use in post-secondary academic curricula.

*5) Global environmental benefits (GEFTF) and GEF indicators*

The TEESB Project contributes to the following GEF-7 Core Indicators:

a) Core indicator 6: Greenhouse Gas Emissions Mitigated captures the amount of GHG emissions expected to be avoided through the GEF project?s investment in bioenergy. It should be measured above a baseline value. Mitigation benefits include:

Direct emissions reductions attributable to the investments made during the project's supervised implementation period, totalled over the respective lifetime of the investments (86,911 $tCO_2$)

Indirect emissions reductions that could result from broader adoption of the outcomes of a GEF project plus longer-term emission reductions from behavioural change, business modes and capacity development in the post-project period. Broader adoption of a GEF project proceeds through several processes including sustaining, mainstreaming, replication, scaling-up and market change (750,507 $tCO_2$)

Sub-indicator 6.4: Increase in installed renewable energy capacity per technology captures the increase in renewable energy generation or storage capacity and is disaggregated by type of renewable energy technology (solar photovoltaic) ? (1,430 kW)

b) Core indicator 11: Number of direct beneficiaries disaggregated by gender as co-benefit of GEF investment captures the total number of direct beneficiaries including the proportion of women beneficiaries. Direct beneficiaries are all individuals receiving targeted support from the project (in buildings, associated with direct GHG reduction; and TEESB capacity building events: 8,440 people, of which at least 3,671 women)

**Exhibit 4 Project results expected at PIF and CEO Endorsement**

| Project GEF-7 Core Indicators | | Expected at PIF | Expected at CEO Endorsement |
|---|---|---|---|
| 6.2 | Greenhouse Gas Emissions Avoided (metric tons of CO2e) ? cumulative (20 yrs lifetime) | 94,331 (direct)<br><br>770,287 (indirect) | 86,911 (direct)<br><br>760,507 (indirect) |
| 6.3 | Energy substituted or saved (cumulative, direct) | 149,732 $MWh_e$<br><br>(at power plant?s gate)<br><br>(539,034 GJ of electr) | Savings of 1,580,208,000 MJ of natural gas<br><br>* 952,866,000 MJ (energy efficiency)<br><br>* 627,342,000 MJ (substitution of natural-gas-generated electricity by solar energy) |
| | Energy substituted or saved (cum., indirect) | 1,222,678 $MWh_e$<br><br>(4,401,640 GJ) | Savings of 13,827,402,000 MJ of natural gas<br><br>8,162,241,000 MJ (energy efficiency)<br><br>5,665,162,000 MJ (substitution by solar energy) |
| 6.4 | Increase in installed solar PV (MW) | | 2.10 MW (direct, rooftop PV)<br><br>19.00 MW (indirect, rooftop PV) |
| 11 | Number of direct beneficiaries disaggregated by gender as co-benefit of GEF investment<br><br>(units of measure: number of people) | 1,328 (direct)<br><br>70,000 (indirect)<br><br>(50% women) | Total direct: 8,440 (3,671 women, 44%). TEESB capacity strengthening events: 620 (of which 219 women. Apartment occupants: 3,240 (in 810 apartments); Office workers: 4,580 (in 7 offices).<br><br>Indirect: 57,370 (31,200 apartment dwellers and 26,170 office workers |

For details on assumptions and calculation methods, the reader is referred to Annex F of the UNDP Project document as well as Annex F of this CEO Endorsement/approval document.

*6) Innovativeness, sustainability and potential for scaling up.*

Sustainability

*- Institutional*

This project will support the Government in establishing the institutional capacity to scale up clean energy investments in public buildings, which in turn will support the successful implementation of NZEB norms and practices. Strengthening the capacity of the ministries and state institutes to evaluate highly-efficient designs and to systematize enforcement of the energy performance aspects of buildings will provide the ministry with a strategic means for keeping actual building performance higher than it would be otherwise and will give staff the expertise to enforce future, more stringent, versions of the codes. Exposure to the examples in EU countries will help build knowledge on monitoring, implementation, and enforcement of energy-relevant guidelines and codes for buildings.

During implementation, the project team will pay close attention to the likely sustainability of project results, including developing the project exit strategy. Concerning institutional sustainability, the team will ensure the key partner institutions have the individual and technical capacities to support the continuation of project results, including the implementation of a programme of NZEB codes and verification (Component 3) as well as the formulation of an NZEB investment strategy (Component 1)

Close cooperation with the Ministry of Construction (MCA), which oversees government-funded construction in the residential sector, will increase the uptake of the techniques that are piloted in the demonstration building in other state-funded construction, and cooperation with municipalities, which oversee many construction projects in the residential sector, will demonstrate results that can be replicated in municipalities across Turkmenistan.

*- Technical and know-how*

The engineering and technical designs will follow Turkmenistan?s regulations for new construction while providing some guidelines for upgrading existing buildings. A building energy automation and/or management system will be introduced as an additional tool to monitor and manage the energy consumption of renovated buildings. Regarding technical capacity and skills, practising architects as well as architecture and engineering students will be trained in efficient building techniques. Raising awareness of developers and utilities regarding the economic benefits of more-efficient housing will result in higher demand for more efficient apartments even after the awareness-raising activities have concluded. The development of sustainable energy protocols for prototype buildings will allow for broad replication of NZE measures (whether used for constructing new buildings or retrofitting new ones) and/or bring them to a national audience, and avoid the need to develop these measures individually for each project.

*- Environmental*

Accounting for about one-fifth of the country?s total GHG emissions (18%), the housing sector has been identified in the National Strategy on Climate Change and the Nationally Determined Contributions

(NDC) of the country as one of the priority sectors (along with oil and gas), where appropriate mitigation measures can help to reduce the country?s carbon footprint. Increased NZE will also support climate change adaptation and sustainability in the short and long run, given the useful life of the buildings of 30?50 years. In water-scarce Turkmenistan, it is important to use fresh water efficiently. Reusing greywater can save up to 30-50% of water use in a residential building and this option will be promoted in the TEESB pilots.

Innovativeness

The most conceptually innovative aspect of the Project is a move towards NZEB buildings for a Central Asian country. Such standards have just recently become an accepted and mandatory practice in the EU and few other jurisdictions in the world come close. However, a straightforward transposition of the standard is not possible because the Government has an approved mechanism for ?vetting? upgrades of the building codes. This vetting process includes the preparation of detailed feasibility justifications, which currently feature 3-year investment horizons but do not consider building and equipment life-cycle costs. The Project will provide the required policy support to the Government along with template economic justifications based on actual and projected energy prices during the lifetime of the buildings. The introduction of IT solutions and ?smart? technologies for building energy management to monitor building energy use, spot immediate and most cost-effective opportunities and effectively monitor performance and improvement is another innovation that the Government appreciates. Without a good EMIS, it is impossible to move on with any decision-making instruments because the savings are not ?visible?.

Potential for scaling-up

With the testing of new and innovative building designs and thermal rehabilitation and climate-proofing methods, in the target pilot district, the project will provide the basis for learning and continuous replication throughout the nation. For example, more stringent requirements could be designed for construction materials procured and for related non-building measurement technologies such as automated/remote-metering and software requirements for electric grids, water and heat utilities.

Because the construction sector has been and remains a key driving force for the economic development of the country, a demonstration of energy saving potential of the project interventions in the building sector is expected to have full government support to facilitate the introduction and further wide-scale adoption of modern standards towards NZE in newly built public and residential buildings.

GHG emission reduction measures in housing and building sectors are seen by the Government as low-hanging fruits in fulfilment of its obligations towards the Paris Agreement by 2030 while providing sufficient time for planning and implementation of long-term concrete measures to reduce the carbon footprint of large income-generating oil and gas sectors. The project?s NZE solutions and results to be tested in the Arkadag, Ashgabat and/or other city mega-projects, will therefore have Government buy-in and significant potential for replication and scaling up in large-scale urban planning deployed throughout the country. This will be expressed in the NZEB investment strategy (Output 1.3). An estimate has been made in the PPG phase on what the size of scaling up could be, on which also estimates of TEESB?s indirect emission reduction is based, as indicated in the table below.

**Exhibit 5 Potential for scaling up**

| | Pilots | Direct- | Indirect-NZEB bldng codes | |
|---|---|---|---|---|
| | 2025-26 | 2028 | 2029-2038 | Annual |
| Floor area (m2) with NZEB | | | | |
| - residential | 8,100 | 210,600 | 2,106,000 | 210,600 |
| - office | 8,640 | 51,840 | 345,600 | 34,560 |
| Cumulative GHG ER (tCO2) | | | | |
| - residential | 2,496 | 64,898 | 648,979 | 64,898 |
| - office | 2,788 | 16,729 | 111,528 | 11,153 |
| TOTAL | *5,284* | *81,627* | *760,507* | *76,051* |
| **Direct - Cumulative GHG ER (tCO2)** | | **86,911** | **760,507** | **Indirect** |
| **Energy savings (MWh of gas)** | | **438,947** | **3,840,945** | |
| - Electricity (in MWHe) | | 15,623 | 141,115 | |
| - Nat. gas (savings direct use) | | 357,578 | 3,347,041 | |

Note: Own elaboration (see Annex G for details).

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[1] See also Section 2 in the UNDP Project Document

[2] Source: BP statistics. The Third National Communication (20160 gives a figure of 66.3 $MtCO_2$, of which 85% (56.3 $MtCO_2$) from the energy sector in 2010. Within energy, fugitive emissions (from upstream oil and gas activities) accounted for 36%, buildings (mainly from electricity energy and heating in residential and municipal buildings) 29%, power generation 22% and transport 13%

[3] See also Section 3 in the UNDP Project Document for more details

[4] See also the Section 3 on strategy and theory of change in the UNDP Project Document and the detailed description of outcomes and outputs in Section 4.1

[5] In the calculation of Annex G, it is assumed that the pilots consist of one residential complex, (based on building with 30 apartments and total storey with total of 8,100 $m_2$ floor space (of which 5,308 $m_2$ apartment space) and one public building with total of 8,640 $m_2$ floor space (of which 6,544 $m_2$ office space). However, other combinations may come out of the (pre-)selection after project?s start, such as one office building with different heights and floor space and different combinations of floors and apartment space in residential buildings.

[6] The assessment will also look at social aspects of energy use by occupants, including indoor temperature and *thermal comfort* as one of the indicators to be measured, linked with overall social-environmental assessments

[7] This strategy will focus on new buildings (as also the NZEB building codes will) and not, in principle, cover retrofitting existing buildings. Existing building may be in future be refurbished to

comply with the 2020 energy building codes (elaborated with support of the earlier Energy Efficiency in the Residential Buildings Sector of Turkmenistan (EERB) project, 2011-2018). However, this falls outside of the scope of the proposed TEESB project.

[8] As appropriate, prescriptive. for key elements such as wall and ceiling insulation, window and doors, roofs, foundations, heating and ventilation, air-conditioning, water heating, lighting fixtures, and controls; describing the performance level of energy consumption or intensity for the whole building, as well providing guidelines on the share of renewable energy in energy consumption.

[9] The Project can help the Government in drafting recommendations for the mandate and the staff structure for the MRV unit, including improved organization structures, terms of reference for key staff, staffing standards, capacities and training needs, as well as equipment needs (for audits and measurements).

[10] Embodied emissions account for 20?50% of an average building?s whole-life emissions. These are not counted in the ?nearly zero energy building? context. In *Net-zero carbon buildings* reduce energy demand as close to zero as possible, with all remaining energy needs satisfied by renewable energy sources, focusing on operational emissions. N*et-zero whole-life carbon building*s minimise on-site embodied carbon and compensate for all residual emissions in the supply chain in addition to the measures targeted by net zero carbon buildings.

[11] Climate-sensitive planning, which for example plans the construction of new buildings, their height, orientation, and design in relation to cold air corridors, green and blue infrastructure as well as social infrastructure, can contribute significantly to energy and CO2 reduction. Therefore, the project will seek to strengthen links with sustainable urban planning. TEESB will coordinate the project with other ongoing GEF Sustainable Cities project in order to expand the impact of EE project to city-level planning..

**1b. Project Map and Coordinates**

**Please provide geo-referenced information and map where the project interventions will take place.**

The map is provided in Annex E
Blue Star - Arkadag is located west of the city limit of Turkmenistan's capital city, Ashgabat, and east of the neighbouring city of G?kdepe at Lat. 38.07 ? Long. 58.06

Red Star - The new Ashgabat City development will be located north of the capital Ashgabat at Lat. 37.96 - Long.58.19


**Box 1 Artist?s view of future new Ashagat City project**

Source: www.ashgabatcity.gov.tm

**Box 2 Location and layout of Arkadag (Ahal province)**





https://www.openstreetmap.org/#map=11/38.0749/58.1853.

**1c. Child Project?**

**If this is a child project under a program, describe how the components contribute to the overall program impact.**

TEESB is not a child project.

**2. Stakeholders**

**Select the stakeholders that have participated in consultations during the project identification phase:**

**Civil Society Organizations** No

**Indigenous Peoples and Local Communities**

**Private Sector Entities** Yes

**If none of the above, please explain why:**

Stakeholder engagement is described in *Section 4.2* of the UNDP Project Document with a Stakeholder Engagement Plan attached as *Annex K* to the ProDoc. Exhibit 8 below specifies in detail how

stakeholders are planned to be engaged in which project outcome or output throughout the project period. The table in Exhibit 9 portrays the stakeholder engagement during Project Preparation.

**Please provide the Stakeholder Engagement Plan or equivalent assessment.**

**Exhibit 8 Stakeholder table**

| Stakeholder | Mandate and/or business | Role in project outcome |
|---|---|---|
| Ministry of Agriculture and Environmental Protection | The Head of the Department of International Relations and Planning of MAEP is the GEF operational and UNFCCC focal point. The Ministry assesses the environmental impacts and benefits of projects | MAEP Will be overall responsible and will provide guidance on determining local environmental benefits from the project and will ensure coordination with other GEF projects in Turkmenistan. |
| Ministry of Construction and Architecture | Develops policies and carries out programs in the construction sector. Includes the bureau that is responsible for design review and enforcement of building codes. Commissions, designs, builds and manages housing stock for its employees. | Will provide both technical assistance and investment funds for efficient construction. Ministry staff will participate in training, particularly on code-related issues in Component 1. Will be involved in the design, implementation and co-financing of the pilot NZEVB Will endorse new NZEB-type codes for standard building types. |
| Ministry of Energy | Among other responsibilities, the Ministry oversees energy policy and energy resource development. Commissions, designs, builds and manages housing stock for its employees. | Will provide both technical assistance and investment funds for efficient construction. Ministry staff will participate in training, particularly on code-related issues in Component 1. Will be involved in the design, implementation and co-financing of the pilot NZEVB |
| Municipalities<br><br>(Ashgabat, Arkadag) | Commissions, designs, builds and manages housing. Oversees urban planning and management in Ashgabat, where several other stakeholders have housing stock. | Will be involved in all project components, particularly those affecting new construction and reconstruction and the replication of NZE approach in new construction, and activities on the application of design protocols |

| Stakeholder | Mandate and/or business | Role in project outcome |
|---|---|---|
| Academic and research institutes | ? Turkmen State Architecture Construction Institute[1]<br><br>? Scientific Research Institute of Seismic Construction<br><br>? State Energy Institute of Turkmenistan<br><br>Institutes train architects and engineers in the construction profession as well as carrying research on construction and materials | Will enhance curriculum on energy efficiency with NZEB topics and train students under Component 4. Will support the implementation of other capacity-building activities (training, workshops, etc.) of Component 4 as well as provide information or carry out assessments and analysis of Components 2 and 3 |
| Utilities | Turkmengaz and Turkmenergo are vertically integrated state-owned power companies. They determine energy needs for public buildings and provide gas and electricity to residential consumers. The utilities also commission, builds, and also manage housing for its employees through several subsidiaries. | Utilities will be involved in the NZEB investment strategy (Comp 1) and the various assessments of Comp 2. |
| Non-government | Other stakeholders include *development partners* (Asian Development Bank; European Bank for Reconstruction and Development), *private sector* (large international construction companies and developers, as well as design firms) and, last but not least, the *beneficiaries* (occupants of residential apartment buildings; office workers in public buildings and building administrators, local community groups; recipients of the project?s training and awareness-raising) | |

*Footnote 13: T?rkmen d?wlet binag?rlik-gurlu?yk instituty*, formerly called Turkmen Polytechnic Institute (see, tdbgi.edu.tm)

In addition, provide a summary on how stakeholders will be consulted in project execution, the means and timing of engagement, how information will be disseminated, and an explanation of any resource requirements throughout the project/program cycle to ensure proper and meaningful stakeholder engagement

As part of the project development (PPG) phase, and in addition to the desk review and data collection exercise, the PPG team of National and International Consultants identified key stakeholders and engaged with them in a series of in-person and online meetings, during the PPG international consultant

mission to Turkmenistan, and thereafter by the PPG gender and social safeguards consultant. In addition, UNDP CO staff had several follow-up meetings with the three ministries involved (MAEP, MOE, MCA)

### Exhibit 9 Stakeholders engaged during TEESB project preparation (PPG)

| Meeting date | Organisatuion |
|---|---|
| 16 January 2023 | Meeting with UNDP<br><br>Internal meeting PPG consultants |
| 17 Jan | Ministry of Energy<br><br>Ministry of Construction and Architecture |
| 18 Jan | Institute of Seismic Construction<br><br>Ministry of Agriculture and Environmental Protection (Separated into the Ministry of Agriculture and the Ministry of Environmental Protection as of July 14, 2023)<br><br>Turkmengas<br><br>Ministry of Finance and Economy |
| 19 Jan | Institute of Construction and Architecture<br><br>Internal meeting PPG consultants |
| 20 Jan | Meeting with the project manager of the EERB Project<br><br>Wrap-up meeting at UNDP |
| 07 June 2023 | Validation workshop (attended by above-mentioned stakeholders) |

**Select what role civil society will play in the project:**

**Consulted only;** Yes

**Member of Advisory Body; Contractor;** Yes

**Co-financier;**

**Member of project steering committee or equivalent decision-making body;** Yes

**Executor or co-executor;**

**Other (Please explain)**

**3. Gender Equality and Women's Empowerment**

**Provide the gender analysis or equivalent socio-economic assesment.**

Gender considerations will be fully mainstreamed into project implementation. Rapidly expanding towns and cities have created employment for many youths and women. Yet, in the construction sector, more women than men find it difficult to access employment. Women continue to be discriminated against about jobs and pay, promotion and security benefits, capacity building and skills development and are subject to poor occupational health and safety standards. While in other industries, many women have been employed in semi-skilled or skilled jobs, in the construction industry, women are often employed as unskilled labourers. The job of an unskilled worker is more strenuous in the construction industry than in other manufacturing industries. However, difficult work is often assigned to women, not because of their physical capacities as compared to men but on the ground of socially assigned roles. Women also show less eagerness to break the traditional ethics that suppress forms of employment that are ?alternative? to the traditional roles.

Human development is a process of enlarging the choices for all people not just for one part of society such a process becomes unjust and discriminatory if most women are excluded from its benefits. Existing sexual stratification in the construction labour market will not go away unless women gain more formal training in such areas as engineering and mechanization. In Turkmenistan, vocational training shows that the share of female students in all technical training facilities seems to be less than a third. Gender discrimination does not start at the point of entry into the labour market but is to large extent pre-determined through unequal division of labour within the home and choices made in education and training systems. Thus, the majority of women are condemned to unskilled work. Often, when men and women enter construction work at the same time, over half of the women will remain as casual workers while only a relatively small fraction of the men remain in that category. It could be alleged therefore that men have more staff development opportunities than women or that men can more easily be promoted to higher positions compared to women. The rigid gender division of labour confines women to a narrower range of income-earning or employment opportunities in the construction industry.

Gender-relevant action in TEESB

The Project will work with the Ministry of Agriculture and Environmental Protection and the Ministry of Construction and Architecture to ensure that big numbers of women are imparted with skills useful to the nascent sector of energy-efficient rehabilitation of the buildings sector. Increased participation of women in the sector will support meaningful employment opportunities for women reducing the extent and intensity of unemployment and poverty. The project will also provide opportunities for women to participate in the design of nearly zero-energy use buildings as well as in the production, supply, delivery, and administration of installation of NZE technologies. Women will also gain access to the capacity building and training, required to understand avenues of participation in the procurement of NZE-related goods and services. The project will ensure that the gender balance is maintained in all project activities (e.g., seminars, and training events).

The Project?s Gender Action Plan (see *Annex J* in the UNDP Project Document for details) will be prepared to

? Encourage national partners to ensure women?s participation and their equal and active participation ensured in all project-related events including consultation processes, workshops and informative events, at the level of at least 35% of total participants, with a special focus on young women professionals in the field of engineering, including university students and academics. This includes primarily the awareness-raising activities regarding the construction and retrofitting of buildings, as well as end-users of electricity in buildings, on EE regulation and best practices.

? Ensure women's representation within the staff of all working groups and workshops to be provided with adequate technical training to meet job requirements.

? Ensure equal representation for men and women in activities related to capacity development in building codes and standards and technical knowledge in the EE buildings sector

The project will also gather gender-disaggregated data for evaluation purposes and use gender-sensitive indicators) to facilitate planning, implementation, and monitoring; particularly around beneficiaries (building occupants and office workers as well as participants in events and project activities). Implementation strategies to deliver these targets will be designed and delivered by the project team in conjunction with key project partners. This will be done through the clear setting of targets in project agreements and regular monitoring of progress. Further to that, the capacity of all stakeholders including the project team and government partners will be increased on gender equality as part of the gender action plan.

**Does the project expect to include any gender-responsive measures to address gender gaps or promote gender equality and women empowerment?**

Yes
**Closing gender gaps in access to and control over natural resources;** Yes

**Improving women's participation and decision making** No

**Generating socio-economic benefits or services or women** Yes

**Does the project?s results framework or logical framework include gender-sensitive indicators?**

Yes
**4. Private sector engagement**

**Elaborate on the private sector's engagement in the project, if any.**

There were over 8,100 domestic private enterprises active in Turkmenistan in 2016. They employed about 200,000 persons (including 76,000 individual entrepreneurs) and had revenues equivalent to 15.2% of GDP. Most of them were active in the agriculture, construction, and manufacturing sectors. About 80% were microenterprises, and only 11% were small enterprises (with 9% medium to large, including 581 foreign enterprises)[1].

Construction relies heavily on public procurement and public financing, which is the area targeted by the Project. Lack of information on the new requirements (on goods and types of materials and equipment needed) threatens to impede the private sector?s operation in the construction sector. This includes both the technology side (represented by producers of materials for insulation and windows), the service sector (installation and maintenance services), and the construction side (represented by construction companies). For example, there has been considerable investment in the production of energy-efficient windows nationwide, but these production facilities would have to be upgraded to adapt to more stringent energy performance requirements. Similarly, vendors of insulation materials or metering equipment will have to adapt to new requirements. The Project will assist them in all these adjustment needs, including the provision of training and assisting business owners in spotting public procurement opportunities. For this purpose, the Project will work with relevant industry associations and large international equipment producers.

Tight administrative controls and the public sector?s dominant role in economic activity have hindered private sector development. Despite the growth of the private sector?s share in segments of the economy, public sector and state-owned monopolies continue to govern the economy and the formal labour market[2]. The infrastructure sector (including buildings but also encompassing such facilities as roads, ports, railways, or street lighting) still lacks normative frameworks providing for the return on private investment into NZE technologies from the energy savings delivered to public facility owners or private residents of the public property. However, in the course of implementation, the project will work with the national partners to look at potential opportunities to attract private sector investment, including from large international construction companies active in country.

The investments in energy efficient air-con, doors, insulation, etc. are not done individually as add-ons later, but are an integral part of the construction as part of the construction contract with the consortium that will be selected as part of the procurement process..

The same applies to solar PV, which will be integrated as part of the pilot buildings construction; these will be installed during the construction by the contracting entity (a ministry or other government entity).

Regarding the residential buildings, these are in the end partly funded by public funds and by private construction companies on a shared equity construction basis. Future owners that register for an apartment in a new building, sign an agreement with the construction company and transfer from 10 to 30 % of the cost of the property (apartment flats) in advance payment, and construction company uses this and its own funds to complete the construction and then property owners pay the rest of the cost after receiving the keys of the apartment. Although the residential buildings are thus for a large part paid for by private entities, the Ministry (MCA) is responsible for the investment planning and fully coordinates the process from design through the commissioning until these are fully sold out to private property owners. The process applies to the pilot building; hence MCA has reflected this in its co-financing letter. For the office building, it will depend on who will own office space in the end, a national or local government entity, or private entity.

The same public-private partnership process (and thus the expected role of private sector funding) is followed in the longer term (that is beyond the pilot buildings and post-project). So, indeed a substantial role for the private sector can be attributed in both direct and indirect emission reduction

SMEs may be subcontracted by such the constructing company on an as-need basis to provide goods, materials, services. The capacity building activities of Component 3 will help getting SMEs up to date to provide NZEB relevant services. Apartment dwellers will be encouraged (through the Project?s interventions under the Component 3 for awareness raising) to acquire efficient appliances (efficient fridges, efficient washers, etc.). Although installation of EE home appliances is outside the scope of the Project, this may offer an opportunity to SMEs to sell such high-EE appliances.

Being coordinated by the contracting entity (Ministry), usually public banks are also involved in the process as guarantors of payment between the parties. No engagement with the private financing sector is foreseen currently for NZE pilots. Widening financing tom private sector is an issue that will be addressed in the NZEB investment strategy (Output 1.3). This will include assessment of the role of the banking sector [3

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[1] *Turkmenistan Diagnostic,* EBRD (2019)

18 www.worldbank.org/en/country/turkmenistan/overview

[3] The banking sector (financial institutions) of Turkmenistan is regulated by the Central Bank of Turkmenistan. There are 11 licensed banks in the country consisting of 6 state, 3 joint stock banks and two branches of foreign banks.

**5. Risks to Achieving Project Objectives**

**Elaborate on indicated risks, including climate change, potential social and environmental risks that might prevent the project objectives from being achieved, and, if possible, the proposed measures that address these risks at the time of project implementation.(table format acceptable):**

**Exhibit 7 Risks and risk mitigation**

| | | |
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| *Social and environmental risks (see also Annex L on SESP in the UNDP Project Document)* | | |

| | | |
|---|---|---|
| 1: Construction related to applying energy-saving infrastructure, technologies and equipment may have negative environmental, social and health impacts, if not designed, and constructed properly | Moderate | Following the requirements of the national Law on Environmental Expertise (2014), process of Environmental Impact Assessment will be applied to buildings construction, including the design and application of the energy-saving technologies and solutions. To ensure that the national EIA process adheres to the UNDP SES requirements all construction projects subject to domestic EIA will be screened for the applicable UNDP SES standards, prior to the initiation of each EIA process. Process of the combined national EIA and UNDP ESIA will be described in the ESMF.<br><br>Environmental and social impact assessment will include recommendations for the mitigation of local environmental and social risks. Besides the other issues, the pilot buildings? ESIAs will include adequate resource efficiency and waste management plan, hazardous materials management and disposal etc. During the building design process (implementation stage), the characteristics of each building will be assessed to identify the possible hazardous materials, as need be. For the construction phase, the ESIA will address good housekeeping, (ii) emissions (including dust, noise, etc.) control, and (iii) proper waste management including hazardous, solid, and construction waste management.<br><br>It should be noted that air ventilation is an integral part of the NZE design (see Annex G). Concerning new buildings only, asbestos is not be used, since its use of is forbidden in Turkmenistan (since 2001 as per Building Code on roofs and rooftops ? SNT 2.03.10-01). In any case, the technical design will scrutinize the: impact on health from applying toxic materials, containing volatile organic compounds (VOC) and formaldehyde.<br><br>During the implementation, the construction companies will be selected through an international tendering process, which will require preparation of the EIA study. r Detailed requirements will be specified in the tenders following international standards and best practices (the most stringent one will be applied). The responsible parties shall confirm that:<br><br>? Construction projects comply with applicable national construction norms/building codes and standards as well as international best practices. The same applies to electric systems (installation of photovoltaic systems, solar heating systems, and the installation of LED lighting systems inside and outside of buildings).<br><br>? Works will be implemented and maintained by the legally registered contractor(s) having relevant permits for the relevant works. Proof of experience and track record will be required from the contractor(s) prior to the award of the retrofit work.<br><br>? Contractor(s) will be required to conduct orientation and training for workers on EE building retrofits, particularly multi-apartment buildings and public buildings. |

| | | |
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| | | |
| | | The contractors will be required to implement the Code of Conduct (CoC). |
| 2: Occupational health and safety arrangements during the construction works and that the employment opportunities provided by the project may fail to comply with national and international labour standards | Moderate | Responsible party agreements/letter of agreements will include requirement to oblige contractors to comply with the national and international labour and working conditions standards, including the occupational health and safety. Procedures will be put in place after project inception. ESMF will include an Occupational Health Management Protocol f in compliance with the national legislation, complemented by the provisions of the Labour Management Procedure to comply with the SES and International Labour Standards<br><br>Such requirements should include, but not necessarily be limited to the following:<br><br>? Provisions for a full occupational safety plan and training in advance of any construction, plus inspections in accordance with and possibly beyond existing national occupational health and safety regulations<br><br>? Provisions to inform construction workers about what wastes are hazardous and therefore should be handled separately from other waste streams.<br><br>? Procedures to avoid the working conditions not meeting the national labour laws and international commitments, and in denial of freedom of association and collective bargaining, use of child labour, forced labour, to discrimination against women considering that construction activities are dominated by men labour. |
| 3: Increases of greenhouse gas emissions or other drivers of climate change due to ?rebound effects? s in newly built complexes. | Moderate | Such ?rebound effects? (putting appliances at higher cooling or heating levels or using oversized consumer appliances) will be addressed by the Project Team during training sessions with residents and via information campaigns in the media and on-site information boards. Reference to awareness raising and capacity development of the residents too shall be clearly included in the project document, in Output 3.2. |
| 4: Constructions of the buildings might not consider access to the buildings by people with disabilities | Moderate | There is a probability that the design of the four pilot buildings (Output 1.1) might omit the design on the accessibility by persons with disabilities and that the project might exacerbate the problem. The Project team will only have the mandate to improve the energy efficiency qualities of the building's design and will have to leverage over broader buildings design features. During project development and the building design process, the buildings will be screened concerning accessibility by persons with disabilities to ensure that the project does not accentuate this issue in any way. |

| | | |
|---|---|---|
| 5: Project activity to promote increased participation of women in the construction sector exposes women to increased risks of employment related discrimination and workplace harassment | Low | In its promotion of increased participation of women in the supported construction and maintenance-related project activities, the project will not encourage informal hires, but rather specifically aim at bringing women out from the grey sector into the fully contracted environment with prior know-your-rights training delivered to interested candidates. This will apply both to the pilot buildings and the new urban developments (new Ashgabat city; Arkadag) as a whole, and to related goods/materials and equipment/services supply chains.<br><br>This risk might apply to all project activities. Gender Analysis (see Annex J in UNDP ProDoc) assesses and presents the status of the women working in the public building/construction sector and their capacity to participate in decision-making or other processes. The gender action plan outlines management measures for this and lists any other gender risks as well as opportunities to involve women in/through the project. Standard Codes of Conduct will be adhered to that address measures on prevention of Sexual Exploitation and Abuse/Sexual Harassment (SEA/SH). |
| 6: Project activities involving local/field interventions and close engagement with local communities may inadvertently contribute to the spread of COVID-19, while project activities may make it difficult to travel or to implement activities (training, workshops) | Low | The risk can be mitigated through adequate safeguards such as: (i) clear procedures in place in case of COVID-19 reinstatement of restrictions, approved during project inception (ii) use of protective equipment, maintaining social distancing and using remote methods of engagement whenever possible (iii) if adequate safeguards cannot be put in place, activities that entail close local communities? engagement will be put on hold if necessary. In general, the work programme/budget will be revised as needed. Wherever possible, online meeting platforms will be used instead of closed-quarters meetings and training in case of COVID-related urgencies. |
| 7: Activities funded by project co-financing partners may not be carried out in consistency with UNDP SES. | Moderate | For activities funded by co-financing partners that are directly coordinated with the project?s activities (i.e., the pilots of output 1.1), any gaps with respect to UNDP SES will be discussed and reviewed regularly, including during the multi-stakeholder coordination platform meetings and Project Board meetings. As a general rule, an agreement will be aimed to be signed with co-financiers (and potentially parallel financiers), outlining that in case of discrepancy/ different policies of the relevant institutions/ financiers, the most stringent Environmental and Social guidelines will be applied. |

| | | |
|---|---|---|
| 8: Inequitable or discriminatory distribution of rights to reside in energy-efficient dwellings to people excluding those living in poverty or other marginalized i.e., excluded individuals or groups. | Low | In assigning families and individuals to newly built and more energy-efficient buildings the Government is being guided both by the current sq. footage availability per household member and an institutional link (i.e., by whether rehoused individuals are employed by the agency/ministry sponsoring the construction of a particular block of flats). Poorer families have an equal chance to be relocated subject to them having a work affiliation (via the employment of a family member), particularly if they hail from more crowded households.<br><br>Although the Project does not partake in the selection of residents for rehousing, it will aim to collect socioeconomic data on all residents rehoused to benchmark their standing against available national and international benchmarks and discuss the findings with the project partners to ensure non-discriminatory/equitable rehousing practices. Also, the project GRM will be available for stakeholders involved in collaborative activities implemented by the project and co-financing partners |
| 9: Investment plan (2027-2036) for NZEB construction fail to sufficiently address issues of sustainable construction, safe construction materials, adaptation to climate change and indoor environmental quality, potentially hindering the positive effects of the project in terms of GHG emissions reduction, energy saving, waste reduction and health and safety of residents. | Moderate | All mentioned outputs will be screened for the potential risks mentioned under Risk 9 and where needed, targeted assessments or appropriately scoped SESA will be conducted to minimize the risks and suggest sustainable building criteria (aligned both with the national legal requirements and UNDP SES) to be incorporated in the relevant outputs. |
| *Operational and organizational* | | |

| | | |
|---|---|---|
| | | |
| 10: Lack of technical, financial and administrative capacities of the Implementing Partners to execute donor-funded projects. Built capacity is lost faster than it can be replenished | Substantial | No local CSOs or NGOs have been identified with the required relevant project execution experience and sufficient capacities to implement as Responsible Part (RP) a donor-funded project of this complexity. Engaging private sector as a Responsible Party also bears a major reputational risk for the UNDP CO. In view of the findings above, the GEF OFP (Ministry of Agriculture and Environmental Protection) has requested UNDP to provide execution support services listed in the GEF OFP letter. Moreover, all procurement to be done under this component will follow a competitive and transparent bidding and selection process. Supplier contracts shall include clauses for performance monitoring, servicing and training of relevant staff. The preparation of the RFP requirements and the subsequent review and assessment of the proposals will include a third-party expert to verify that the costs do not exceed the incremental costs of the standard prices in the market that have similar technical specifications. |
| *Political and financial* | | |
| 11: Lack of co-financing for new NZEB builds and buildings beyond the pilot buildings financed by the Project. | High | The project will not disburse any funds until the feasibility studies (to be produced at the initial phase of the Project work) are not assessed by the Government and their conclusions as regards changing the outdated regulations are given the green light. The Project will also develop a phased investment plan that will be starting from not later than Year 4. |
| 12: The Government doesn?t pass NZEB regulation legislation during the time frame of the project. | Moderate | The government has demonstrated a strong interest in resource efficiency and climate change mitigation. It understands building codes but also weighs additional investment costs against additional natural gas export revenues. Decision-making can be time-consuming; the EERB building codes were only approved after the project?s end and the regulation regarding the submission of documentation of construction according to the building codes is still pending. Hence, the importance in TEESB adhered to lifecycle cost assessment and capacity building of officials and decision-makers, as well as formulating an action plan for NZEB and changes in the legal-regulatory framework |
| *Climate change impacts* | | |
| 13. Climate change impacts and variability risks (extreme heat and cold events that are expected to be more frequent due to climate change) | Moderate | Climate risks might affect the implementation of the projects due to prolonged periods of extreme heat in the summertime when no installation work might be undertaken due to hostile working conditions for manual labour in an unconditioned environment. This will be taken into account in the SESP/labour management plans of the pilot/demo activities. Buildings are usually designed to maintain continued operation during disasters, through structurally robust walls and roofs that can withstand seismic and extreme weather events.<br><br>By investing in rainwater harvesting and where suitable enhanced use of grey water, the project can support adaptation to drought (see *Annex G in the Project Document* for a description) |

More details on risks are given in Annex F (Risk register) and Annex L (Social and environmental safeguards planning) of the UNDP Project Document.

*Note on climate change and variability:*

The key aspects of the climate change projects/scenarios at the project location indicate that many of the climate change impacts which are already evident include rising temperatures, intensifying droughts, declining precipitation, increasing salinization, and the heightening prevalence of dust storms. Observed changes in Turkmenistan?s climate are well established. Averaged over the 1950-2010 period, average temperatures have been increasing at a rate of about 0.7?C per century. Over the same period, average rainfall in the southern part of the country (where Ashgabat is located) has been decreasing while the number of rainy days has also been decreasing (in 2021, rainfall dropped to as low as 17% of the average annual value). The frequency of dust and sandstorms has also been increasing across Turkmenistan suggesting that within the next ten years, Turkmenistan could witness more sand dust storms per year due to climatic changes within the region, especially decreases in annual rainfall, as well as the drying of marshland areas. Recurrent drought is also common throughout Turkmenistan and has produced enormous economic, environmental, and social impacts.

**6. Institutional Arrangement and Coordination**

**Describe the institutional arrangement for project implementation. Elaborate on the planned coordination with other relevant GEF-financed projects and other initiatives.**

**Section 1: General roles and responsibilities in the projects? governance mechanism**

Implementing Partner and Entities:

The Project will be implemented under the *CO Support to National Implementation Modality* (Supported NIM). The **Implementing Partner** for this project is the **Ministry of Environmental Protection (MEP)**. The Implementing Partner is the entity to which the UNDP Administrator has entrusted the implementation of UNDP assistance specified in this signed project document along with the assumption of full responsibility and accountability for the effective use of UNDP resources and the delivery of outputs, as set forth in this document. To assist with successfully delivering project outcomes and components, MEP is supported by a) the Ministry of Energy, and b) Ministry of Construction and Architecture.

The Implementing Partner is the entity to which the UNDP Administrator has entrusted the implementation of UNDP assistance specified in this signed project document along with the assumption of full responsibility and accountability for the effective use of UNDP resources and the delivery of outputs, as set forth in this document.

The Implementing Partner is the ultimate responsible for executing this project. Specific tasks include:

? Project planning, coordination, management, monitoring, evaluation and reporting. This includes providing all required information and data necessary for timely, comprehensive and evidence-based project

reporting, including results and financial data, as necessary. 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 and generated by the project supports national systems.

? Overseeing the management of project risks as included in this project document and new risks that may emerge during project implementation.

? Procurement of goods and services, including human resources.

? Financial management, including overseeing financial expenditures against project budgets.

? 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.

Due to lack of IP?s capacity to execute international donor funded project and lack of third (responsible) party options for project implementation in the country, the GEF OFP (Ministry of Environmental Protection) has requested UNDP to provide execution support services listed in the GEF OFP letter (attached to the project submission package). The execution support services requested by the Government from and to be provided by UNDP include:

? Transparent and competitive process for procurement of goods, services, and works for the project. The specific procurement cases where UNDP assistance is required will be identified through a detailed annual procurement plan for the project.

? Procurement of goods and services from international and national suppliers (including contracting). Certification for contract performance and acceptance of goods and services as per Project Procurement Plan;

? Identification and/or recruitment of key project personnel (PM, PA and key specialists/component leads with contracts of 12 months and above) and international and national consultants according to UNDP norms and requirements, management of consultant activities.

? Financial services, including the processing of payments under the contracts concluded by UNDP, which includes creating vendors, payment reconciliation, and preparation of expenditure reports (such as CDRs) to partners and donors.

? Equipment and Asset Management services, including IT equipment maintenance, licenses, and ICT support for the project team and project activities.

? Administrative support for the project, including travel support and travel settlement.

Project stakeholders and target groups:

An overview of the main stakeholders and target groups is given in section 4.4, while Annex K provides details on their involvement in the Project.

UNDP:

UNDP is accountable to the GEF for the implementation of this project. This includes overseeing project execution undertaken by the Implementing Partner to ensure that the project is being carried out in accordance with UNDP and GEF policies and procedures and the standards and provisions outlined in the Delegation of Authority (DOA) letter for this project. **The UNDP GEF Executive Coordinator, in consultation with UNDP Bureaus and the Implementing Partner, retains the right to revoke the project DOA, and suspend or cancel this GEF project.** UNDP is responsible for the Project Assurance function in the project governance structure and presents to the Project Board and attends Project Board meetings as a non-voting member.

A firewall will be maintained between the delivery of project oversight and quality assurance performed by UNDP and charged to the GEF Fee and any support to project execution performed by UNDP (as requested by and agreed to by both the Implementing Partner and GEF) and may be charged to the GEF project management costs (only if approved by GEF). The segregation of functions and firewall provisions for UNDP in this case is described in the next section.

UNDP Country Office execution support, in line with UNDP POPP, can only be provided (as requested by Government and subject to agreement with the GEF) by the corresponding authorized Operations staff of UNDP CO in Turkmenistan. To ensure strict separation of execution and oversight functions as required by the GEF and in accordance with the UNDP Internal Control Framework, the above-requested execution services will be delivered by different staff members, i.e., independently from the GEF ?specific oversight and quality assurance services.

**Section 2: Project governance structure**

The UNDP Resident Representative assumes full responsibility and accountability for oversight and quality assurance of this Project and ensures its timely implementation in compliance with the GEF-specific requirements and UNDP?s Programme and Operations Policies and Procedures (POPP), its Financial Regulations and Rules and Internal Control Framework. A representative of the UNDP Country Office will assume the assurance role and will present assurance findings to the Project Board, and therefore attends Project Board meetings as a non-voting member.

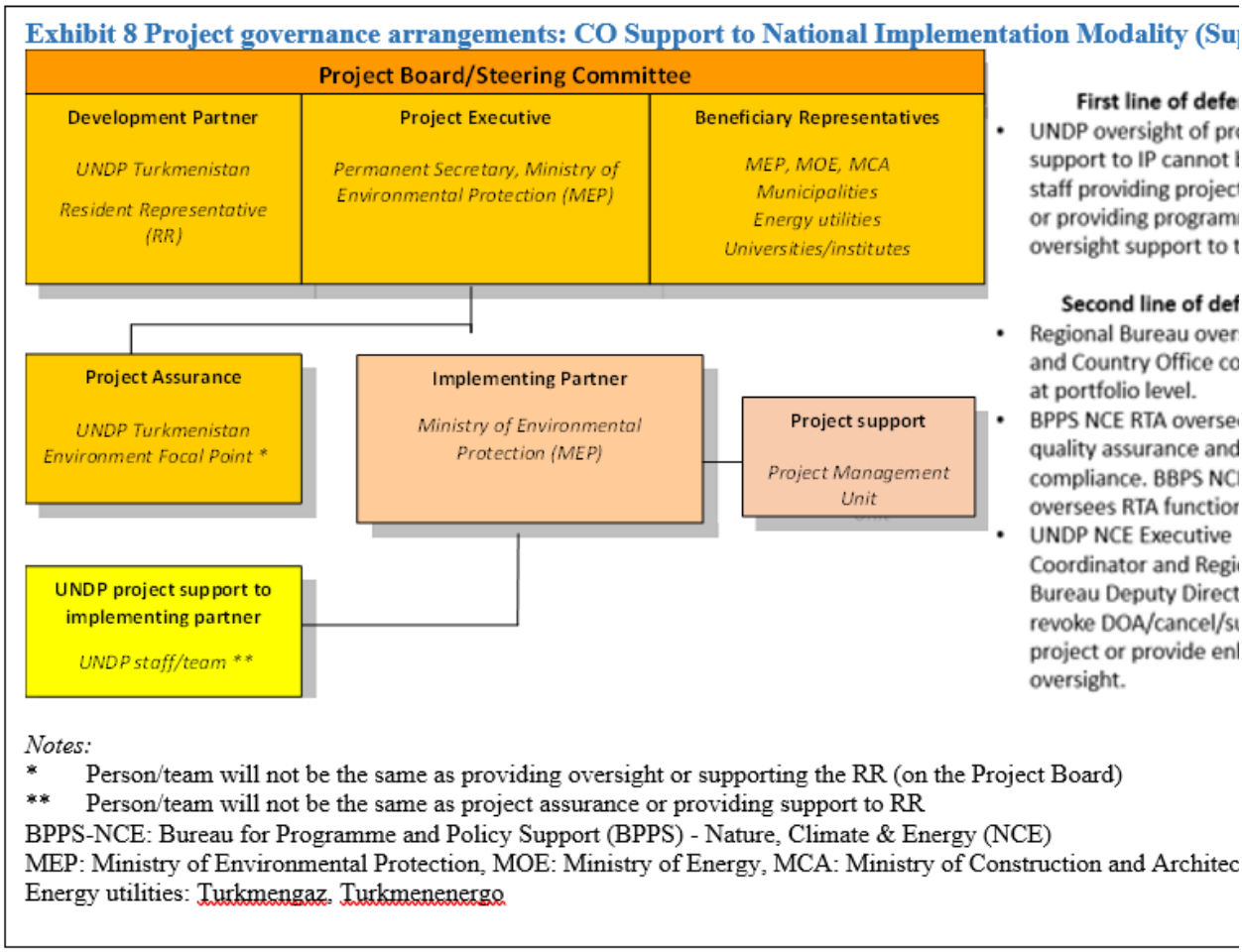
**UNDP project support***:* The Implementing Partner and GEF OFP have requested UNDP to provide support services. The execution support services ? whether financed from the project budget or other sources - have been set out in detail and agreed between UNDP Country Office and the Implementing Partner in a Letter of Agreement (LOA). The draft LOA is attached to this Project Document and will be signed with the Project Document after the CEO Endorsement.

To ensure the strict independence required by the GEF and in accordance with the UNDP Internal Control Framework, these execution services will be delivered independent from the GEF-specific oversight and quality assurance service.

The Implementing Partner will designate a high-ranking official as the **National Project Coordinator**. He/she will assume responsibility for the Project on behalf of the National Government. The NPC will be

responsible for the overall direction, strategic guidance and timely delivery of the project outputs. The NPC presents the ownership of the project.

**Exhibit 8 Project governance arrangements: CO Support to National Implementation Modality (Supported NIM)**




**Section 3: Segregation of duties and firewalls vis-?-vis UNDP representation on the project board:**

As noted in the Minimum Fiduciary Standards for GEF Partner Agencies, in cases where a GEF Partner Agency (i.e. UNDP) carries out both implementation oversight and execution of a project, the GEF Partner Agency (i.e. UNDP) must separate its project implementation oversight and execution duties, and describe in the relevant project document a: 1) Satisfactory institutional arrangement for the separation of implementation oversight and executing functions in different departments of the GEF Partner Agency; and 2) Clear lines of responsibility, reporting and accountability within the GEF Partner Agency between the project implementation oversight and execution functions.

UNDP?s implementation oversight role in the project ? as represented in the Project Board and via the Project Assurance function ? is performed by the UNDP Environmental Focal Point (not the same person supporting the RR on the Board). UNDP?s execution role in the project (as requested by the implementing partner and

subject for approval by the GEF) is performed by a UNDP staff that will not be the same as project assurance or the person providing support to RR.

**Section 4: Roles and Responsibilities of the Project Organization Structure:**

**a) Project Board:** All UNDP projects must be governed by a multi-stakeholder board or committee established to review performance based on monitoring and evaluation, and implementation issues to ensure quality delivery of results. The Project Board (also called the Project Steering Committee) is the most senior, dedicated oversight body for a project.

The two main (mandatory) roles of the project board are as follows:

1) **High-level oversight of the execution of the project by the Implementing Partner** (as explained in the ?Provide Oversight? section of the POPP). This is the primary function of the project board and includes annual (and as-needed) assessments of any major risks to the project and decisions/agreements on any management actions or remedial measures to address them effectively. The Project Board reviews evidence of project performance based on monitoring, evaluation and reporting, including progress reports, evaluations, risk logs and the combined delivery report. The Project Board is responsible for taking corrective action as needed to ensure the project achieves the desired results.

2) **Approval of strategic project execution decisions of the Implementing Partner** with a view to assess and manage risks, monitor and ensure the overall achievement of projected results and impacts and ensure long-term sustainability of project execution decisions of the Implementing Partner (as explained in the ?Manage Change? section of the POPP).

**Requirements to serve on the Project Board**:

? Agree to the Terms of Reference of the Board and the rules on protocols, quorum and minuting.

? Meet annually; at least once.

? Disclose any conflict of interest in performing the functions of a Project Board member and take all measures to avoid any real or perceived conflicts of interest. This disclosure must be documented and kept on record by UNDP.

? Discharge the functions of the Project Board in accordance with UNDP policies and procedures.

? Ensure highest levels of transparency and ensure Project Board meeting minutes are recorded and shared with project stakeholders.

**Responsibilities of the Project Board**:

? Consensus decision-making:

o The project board provides overall guidance and direction to the project, ensuring it remains within any specified constraints and providing overall oversight of the project implementation.

o Review project performance based on monitoring, evaluation and reporting, including progress reports, risk logs and the combined delivery report;

o The project board is responsible for making management decisions by consensus.

o In order to ensure UNDP?s ultimate accountability, Project Board decisions should be made in accordance with standards that shall ensure management for development results, best value money, fairness, integrity, transparency and effective international competition.

o In case consensus cannot be reached within the Board, the UNDP representative on the board will mediate to find consensus and, if this cannot be found, will take the final decision to ensure project implementation is not unduly delayed.

? Oversee project execution:

o Agree on the Project Manager?s tolerances as required, within the parameters outlined in the project document, and provide direction and advice for exceptional situations when the project manager?s tolerances are exceeded.

o Appraise annual work plans prepared by the Implementing Partner for the Project; review combined delivery reports prior to certification by the implementing partner.

o Address any high-level project issues as raised by the project manager and project assurance;

o Advise on major and minor amendments to the project within the parameters set by UNDP and the donor and refer such proposed major and minor amendments to the UNDP BPPS Nature, Climate and Energy Executive Coordinator (and the GEF, as required by GEF policies);

o Provide high-level direction and recommendations to the project management unit to ensure that the agreed deliverables are produced satisfactorily and according to plans.

o Track and monitor co-financed activities and realisation of co-financing amounts of this project.

o Approve the Inception Report, GEF annual project implementation reports, mid-term review and terminal evaluation reports.

o Ensure commitment of human resources to support project implementation, arbitrating any issues within the project.

? Risk Management:

o Provide guidance on evolving or materialized project risks and agree on possible mitigation and management actions to address specific risks.

o Review and update the project risk register and associated management plans based on the information prepared by the Implementing Partner. This includes risks related that can be directly managed by this project, as well as contextual risks that may affect project delivery or continued UNDP compliance and

reputation but are outside of the control of the project. For example, social and environmental risks associated with co-financed activities or activities taking place in the project?s area of influence that have implications for the project.

o Address project-level grievances.

? Coordination:

o Ensure coordination between various donor and government-funded projects and programmes.

o Ensure coordination with various government agencies and their participation in project activities.

**Composition of the Project Board**: The composition of the Project Board must include individuals assigned to the following three roles:

1. **Project Executive:** This is an individual who represents ownership of the project and chairs (or co-chairs) the Project Board. The Executive usually is the senior national counterpart for nationally implemented projects (typically from the same entity as the Implementing Partner), and it must be UNDP for projects that are direct implementation (DIM). In exceptional cases, two individuals from different entities can co-share this role and/or co-chair the Project Board. If the project executive co-chairs the project board with representatives of another category, it typically does so with a development partner representative. The Project Executive will be a senior official from the *Ministry of Environmental Protection*
2. **Beneficiary Representative(s):** Individuals or groups representing the interests of those groups of stakeholders who will ultimately benefit from the project. Their primary function within the board is to ensure the realization of project results from the perspective of project beneficiaries. Often representatives from civil society, industry associations, or other government entities benefiting from the project can fulfil this role. Represented by senior officials will be *Ministry of Energy; Ministry of Construction and Architecture*, as well as Turkmengaz, and representatives from municipalities were the pilot NZEBs are located[1] and selected state institutes
3. **Development Partner:** Individuals or groups representing the interests of the parties concerned that provide funding, strategic guidance and/or technical expertise to the project. The Development Partner is represented by the *UNDP Resident Representative or Deputy Resident Representative.*

b) **Project Assurance:** Project assurance is the responsibility of each project board member; however, UNDP has a distinct assurance role for all UNDP projects in carrying out objective and independent project oversight and monitoring functions. UNDP performs quality assurance and supports the Project Board (and Project Management Unit) by carrying out objective and independent project oversight and monitoring functions, including compliance with the risk management and social and environmental standards of UNDP. The Project Board cannot delegate any of its quality assurance responsibilities to the Project Manager. Project assurance is totally independent of project execution.

A designated representative of UNDP playing the project assurance role is expected to attend all board meetings and support board processes as a non-voting representative. It should be noted that while in certain cases UNDP?s project assurance role across the project may encompass activities happening at several levels

(e.g., global, regional), at least one UNDP representative playing that function must, as part of their duties, specifically attend board meeting and provide board members with the required documentation required to perform their duties. The UNDP representative playing the main project assurance function is an official of the UNDP Country Office, Turkmenistan

c) **Project Management ? Execution of the Project:** The Project Manager (PM) is the senior most representative of the Project Management Unit (PMU) and is responsible for the overall day-to-day management of the project on behalf of the Implementing Partner, including the mobilization of all project inputs, supervision over project staff, responsible parties, consultants and sub-contractors. The project manager typically presents key deliverables and documents to the board for their review and approval, including progress reports, annual work plans, adjustments to tolerance levels and risk registers.

A designated representative of the PMU is expected to attend all board meetings and support board processes as a non-voting representative. The primary PMU representative attending board meetings is the *Project Manager (PM).* Efforts shall be made to mobilise the project team for the full project tenure to ensure the availability of experts and consultants until the end of the Project. Apart from the PM, the structure of PMU will include a *Pilots and Technical Coordinator* (Deputy Manager) as well as a *Financial-Administrative Officer*. Detailed job descriptions are provided in Annex G. A *Lead Advisor (LA)* will be hired at the start of the project at the same time as the Project Manager (with a specialization in green and low-energy building and construction) on an intermittent basis to support the PMU to recommend actions that focus work plans on achieving key milestones in a timely manner; recommend special expertise to be deployed on the Project to assist in its achievement of key milestones; and provide the interface between Project team and key specialist consultants, both domestic and international when appropriate. A local *Gender and Social Safeguards* expert will be added part-time to the project team. On an as-needed basis, short-term experts and contracted companies will be hired to work on assignments in research, policy development, communications and outreach, and technical assistance of activities in the various project components.

[1] Turkmen State Architecture Construction Institute; Scientific Research Institute of Seismic Construction

**7. Consistency with National Priorities**

Describe the consistency of the project with national strategies and plans or reports and assesments under relevant conventions from below:

NAPAs, NAPs, ASGM NAPs, MIAs, NBSAPs, NCs, TNAs, NCSAs, NIPs, PRSPs, NPFE, BURs, INDCs, etc.

The Minister of the Ministry of Agriculture and Environmental Protection (MAEP) is the GEF political focal point, while the Head of Department of International Relations and Planning of MAEP is the GEF operational and UNFCCC focal point. The state remains a dominant player in the electricity market, in which generation, distribution, and transmission services are controlled by the utility Turkmenenergo. Natural gas markets are dominated by Turkmengaz, which acts as the country?s primary developer, supplier, and seller of natural gas. Key institutions often play multiple roles in the housing and energy sector. Several key agencies influence residential construction and energy policy, and at the same time design and manage housing for their employees. The Ministry of Construction and Architecture oversees construction targets, handles building codes and enforcement (through Glavgosexpertiz), but it also commissions, designs, and manages its own housing stock. Turkmengaz also commissions, builds, and manages housing for its employees through several subsidiaries, while its subsidiary Nebitgazkhyzmat is in charge of providing energy to new buildings that are constructed; another subsidiary, Neftegazstroy, serves as a contractor to Turkmengaz and is responsible for constructing employee housing and office buildings

**Exhibit 9 Turkmenistan policies and plans with relevance to sustainable energy in buildings**

| Policy/planning document | Relevance |
|---|---|
| National Strategy of Socio-Economic Development of Turkmenistan to the year 2030 | The National Strategy sets targets for bigger average living space by increasing investment in residential construction (in many cases moving families from single-family dwellings into multi-unit apartment buildings |
| Law on Electricity | The Law provides an overarching framework for the regulation of the country?s electricity generation, appointing the Cabinet of Ministers and the Ministry of Energy as the electricity<br><br>sector?s two main regulators. Moreover, financial incentives for energy efficiency projects are introduced, and accelerating the deployment of renewable energy has been set as an objective |
| Law on Licensing (2019)<br><br>Law on Subsoil and the Law on Hydrocarbon Resources (2020) | The Law determines the process for obtaining licenses across all sectors of the economy, including in the energy sector. The power and fossil fuel sectors are dominated by the state-owned utilities Turkmenenergy, Turkmengas and Turkmenoil. |
| Law on Public-Private Partnerships (2021) | The Law on Public?Private Partnership regulates the process of preparing and implementing public-private partnership projects. Turkmenistan has two separate laws on investment, both of which establish the main rights and duties of investors (Law on Investment Activities in Turkmenistan (1992) and the Law on Foreign Investments (2008) |

| Policy/planning document | Relevance |
|---|---|
| National Climate Change Strategy of Turkmenistan | The Strategy (adopted in June 2012) considers energy efficiency and savings and the increased use of alternative energy sources as the main priorities of the policy, oriented towards the reduction of GHG emissions. According to the Strategy, priorities for developing the housing and municipal services sector include a) improving the performance efficiency of municipal heating supply systems, b) improving the regulatory framework for construction standards and rules towards ensuring energy efficiency and heating supply security of buildings, and c) promoting public awareness raising and motivation activities |
| National Strategy on Development of Renewable Energy for the period up to 2030<br><br>Law on Renewable Energy (2021) | The National Strategy on Renewable Energy was issued in 2021. The Government will develop several legal-regulatory documents that complement and enable the implementation of the Strategy. UNDP jointly with the Ministry of Energy, and the State Energy Institute of Turkmenistan has worked on the development of the new Laws of Turkmenistan "On Renewable Energy Sources" (adopted by the Parliament of Turkmenistan on March 13, 2021) and "On Energy Efficiency and Energy Saving" (under consideration of the Parliament of Turkmenistan)<br><br>The Law on Renewable Energy (2021) determines legal, organizational, economic and social bases of activities in the field of renewable energy resources and governs the arising relations connected with the use of renewable energy resources. The Law?s stipulations include major incentives for renewable energy projects (including easier land leases, and guaranteed purchase of electricity generated from renewable sources). |

**8. Knowledge Management**

**Elaborate the "Knowledge Management Approach" for the project, including a budget, key deliverables and a timeline, and explain how it will contribute to the project's overall impact.**

The Project emphasizes strong communication with a broader range of stakeholders. Key elements of the project?s communication strategy are outlined in Exhibit 10. The budget for workshops, training and information dissemination (printed materials, etc.) is about USD 183,000 (not including consultancy or contracted services which are in separate budget lines).

**Exhibit 10 Communication strategy**

| Key element | Relevant group | Means | Timeframe |
|---|---|---|---|
| 1. Project governance meetings; PSC meetings and its Working Group meetings | All stakeholders that are members of the PSC or its Working Groups or are invited to attend | Meetings | Periodically, depending on PSC and Advisory Committee frequency of meetings |

| | | | |
|---|---|---|---|
| 2. Seminars/workshops and training events, including the Inception workshop, and final project workshop | National and sub-national government officials<br><br>Private sector; NGOs and CSOs | Workshop, meeting, seminar, training (gender-sensitive, socially inclusive)<br><br>On-the-job training<br><br>Budget: | Typically, workshops will be held to start up an activity and/or at the end to present results. The timeline of each activity is given in *Annex D* of the UNDP ProDoc |
| 3. Project documents, thematic reports and publications; Technical and other reports | Government departments and decision-makers at the national and sub-national level;<br><br>Development partners<br><br>Research institutes and academia; individual experts; NGOs | Direct dissemination (e.g., email or hard copy/ USB-drive). Regular access via website to reports and documents and database and info systems | Technical reports will typically be published at the end of an assignment (see *Annex D* of the ProDoc). |
| 4. Project knowledge capturing and info dissemination (gender-sensitive, socially inclusive) | Government officials<br><br>Financial and private sector<br><br>Development partners;<br><br>NGOs and CSOs | Online access;<br><br>Printed materials;<br><br>Media | Thematic reports and knowledge products are published at the end of one or more outputs to provide a summary of findings, results, and lessons learnt |
| 5. Communications on significant project- related works that could be disruptive to individuals, communities, recreation and or livelihoods. | All stakeholders but particularly government departments and decision-makers at the national and sub-national level; subcontractors working on behalf of the project and or project partners | Online access<br><br>Printed materials distributed and or pinned up in public and high-traffic areas that meet gender-sensitive standards<br><br>Radio (which is still a reliable source, particularly for the elderly)<br><br>Media and Social Media including Facebook/Instagram using gender-sensitive communications principles or guidance | Periodically and at least 30 days before any significant physical works are to be undertaken.<br><br>During works if any significant changes are to occur (e.g., stoppages, intensification and or extension of the activity. |

The project will effectively engage the stakeholders involved in the project to get their support and guide the project implementation to achieve higher results.

? Project outreach proposed includes a project website, media (print/audiovisual), workshops, training, etc.

? The PMU and the Project Board will ensure that the Gender Action Plan (see Annex J of the UNDP ProDoc) and Stakeholder Engagement Plan (see Annex K of the UNDP ProDoc) recommended by the project are pursued and implemented. The various groups especially women will be engaged during the consultation meetings and be included in the different capacity-building programs. The project will also ensure that it is closely coordinated with other initiatives supported by development partners on electric mobility

? Meetings, monitoring visits, surveys, and written communications will be used to receive feedback to continue the ongoing dialogue as well as during implementation.

? The project will follow a participatory approach in decision-making by engaging all the relevant stakeholders. Government agencies, NGOs, CSOs, and private sector actors will be actively involved during the project implementation.

**9. Monitoring and Evaluation**

**Describe the budgeted M and E plan**

Project-level monitoring and evaluation will be undertaken in compliance with UNDP requirements as outlined in the UNDP POPP (including guidance on GEF project revisions) and UNDP Evaluation Policy **The UNDP Country Office is responsible for ensuring full compliance with all UNDP project M&E requirements including project monitoring, UNDP quality assurance requirements, quarterly risk management, and evaluation requirements.**

Additional mandatory GEF-specific M&E requirements will be undertaken in accordance with the GEF Monitoring Policy and the GEF Evaluation Policy and other relevant GEF policies[1]. The M&E plan and budget included below will guide the GEF-specific M&E activities to be undertaken by this project.

In addition to these mandatory UNDP and GEF M&E requirements, other M&E activities deemed necessary to support project-level adaptive management will be agreed ? including during the Project Inception Workshop - and will be detailed in the Inception Report.

**Key Project-specific M&E and Responsibilities**

The Project Manager will play a key role in regularly monitoring the outcomes and activities of this project. In particular, REA will support the day-to-day monitoring of the project?s activities. The Project Manager is responsible for day-to-day project management and regular monitoring of project results and risks, including social and environmental risks (outlined in SESP) as well as gender action plan outcomes (outlined in Gender Assessment and Action Plan). The Project Manager will ensure that all project staff maintain a high level of transparency, responsibility and accountability in M&E and reporting of project results. The Project Manager will inform the Project Board, the UNDP Country Office and the UNDP-GEF RTA of any delays or difficulties as they arise during implementation so that appropriate support and corrective measures can be adopted.

Further, the Project Manager is responsible to initiate and manage primary data collection for indicators in the Project Results Framework. The following key M&E activities and reports are proposed to be produced during the implementation of this project, and are required to be collected, monitored and evaluated under the oversight of the Project Manager: a) M&E for Project Objective, Outcomes and GEF Core Indicators, b) M&E for Project Component-level Outcome Indicators

The Project Manager will develop annual work plans based on the multi-year work plan included in the Annex of UNDP Project Document, including annual output targets to support the efficient implementation of the project. The Project Manager will ensure that the standard UNDP and GEF 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 GEF PIR, and that the monitoring of risks and the various plans/strategies developed to support project implementation occur on a regular basis.

Project Board (PB): The Project Board will take corrective action as needed to ensure the project achieves the desired outcomes and results. The PB 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 PB will hold an end-of-project review to capture lessons learned and discuss opportunities for scaling up and to disseminate results and lessons learned with relevant project stakeholders. This final review meeting will also discuss the findings outlined in the project terminal evaluation report and the management response.

Project Implementing Partner: With support from the project, MEB will develop and deploy a monitoring, evaluation, reporting, and verification system to track the implementation of master planning, policy and regulatory frameworks, feasibility studies, training, and associated investments. REA will use this system to supply all required information and data necessary for timely, comprehensive and evidence-based project reporting, including results and financial data. MEB will strive to ensure that project-level M&E is undertaken by project stakeholders in both the public and private sectors, and that the results of M&E are aligned with national systems so that the data used by and generated by the project supports national systems.

UNDP Country Office: The UNDP Country Office will support the Project Manager as needed, and be available to support MEB as needed. Project progress meetings will take place according to the schedule outlined in the annual work plan. Notes of the Project Progress meetings will be taken by the project team and circulated to the Project Board. The UNDP Country Office will support key GEF M&E activities including the annual GEF PIR, the independent mid-term review and the independent terminal evaluation. The UNDP Country Office will also ensure that the standard UNDP and GEF 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; that annual targets at the output level are developed and monitored and reported using UNDP corporate systems; the regular updating of the ATLAS risk log; and updating of UNDP gender marker on an annual basis based on gender mainstreaming progress reported in the GEF PIR and UNDP ROAR. Any quality concerns flagged during these M&E activities (such as annual GEF PIR quality assessment ratings) must be addressed by the UNDP Country Office and the Project Manager. 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 undertaken by the UNDP Independent Evaluation Office (IEO) and/or the GEF Independent Evaluation Office (IEO).

UNDP-NCE Unit: Additional M&E and implementation quality assurance and troubleshooting support will be provided by the UNDP-NCE Regional Technical Advisor and the UNDP-NCE Unit as needed.

**Additional GEF monitoring and reporting requirements:**

Inception Workshop and Report: A project inception workshop will be held within 60 days of project CEO endorsement, with the aim to:

? Familiarize key stakeholders with the detailed project strategy and discuss any changes that may have taken place in the overall context since the project idea was initially conceptualized that may influence its strategy and implementation.

? Discuss the roles and responsibilities of the project team, including reporting lines, stakeholder engagement strategies and conflict resolution mechanisms.

? Review the results framework and monitoring plan.

? 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; discuss the role of the GEF OFP and other stakeholders in project-level M&E.

? Update and review responsibilities for monitoring project strategies, including the risk log; SESP report, Social and Environmental Management Framework and other safeguard requirements; project grievance mechanisms; gender strategy; knowledge management strategy, and other relevant management strategies.

? Review financial reporting procedures and budget monitoring and other mandatory requirements and agree on the arrangements for the annual audit.

? Plan and schedule Project Board meetings and finalize the first-year annual work plan.

? Formally launch the Project.

GEF Project Implementation Report (PIR): The annual GEF PIR covering the reporting period July (previous year) to June (current year) will be completed for each year of project implementation. Any environmental and social risks and related management plans will be monitored regularly, and progress will be reported in

the PIR. The PIR submitted to the GEF will be shared with the Project Board. The quality rating of the previous year?s PIR will be used to inform the preparation of the subsequent PIR.

Lessons learned and knowledge sharing: Results from the project will be disseminated to all key project stakeholders via M&E and Knowledge Dissemination workshops. The project will also closely coordinate and participate in UN Environment?s Global E-Mobility Program (GEF-funded) activities and workshops, to share lessons learned and potentially use tools and systems developed by the Global Program.

GEF Core Indicators: The GEF Core indicators will be used to monitor global environmental benefits and will be updated for reporting to the GEF prior to MTR and TE. Note that the project team is responsible for updating the indicator status. The updated monitoring data should be shared with MTR/TE consultants prior to required evaluation missions, so these can be used for subsequent ground-truthing. The methodologies to be used in data collection have been defined by the GEF and are available on the GEF website.

Independent Mid-term Review (MTR): The terms of reference, the review process and the final MTR report will follow the standard templates and guidance for GEF-financed projects available on the UNDP Evaluation Resource Center (ERC). The evaluation will be ?independent, impartial and rigorous?. The evaluators 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. Equally, the evaluators should not be in a position where there may be the possibility of future contracts regarding the project under review. The GEF Operational Focal Point and other stakeholders will be actively involved and consulted during the evaluation process. Additional quality assurance support is available from the BPPS/GEF Directorate. The final MTR report and MTR TOR will be publicly available in English. The MTR process will begin after the second PIR has been submitted to the GEF, and the MTR report will be submitted to the GEF in the same year as the 3rd PIR. A management response to MTR recommendations will be posted in the ERC within six weeks of the MTR report?s completion. The MTR 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.

Terminal Evaluation (TE): An independent terminal evaluation (TE) will take place upon completion of all major project outputs and activities. The terms of reference, the evaluation process and the final TE report will follow the standard templates and guidance for GEF-financed projects available on the UNDP Evaluation Resource Center. The evaluation will be ?independent, impartial and rigorous?. The evaluators 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. Equally, the evaluators should not be in a position where there may be the possibility of future contracts regarding the project being evaluated. The GEF Operational Focal Point and other stakeholders will be actively involved and consulted during the terminal evaluation process. Additional quality assurance support is available from the BPPS/GEF Directorate. The final TE report and TE TOR will be publicly available in English. The terminal evaluation process will begin three months before the 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 Project Manager will remain on contract until the TE report and management response has been finalized. A management response to the TE recommendations will be posted to the ERC within six weeks of the TE report?s completion. The final TE report will be cleared by the UNDP Country Office and the UNDP-GEF Regional

Technical Advisor and will be approved by the Project Board. The UNDP Country Office will include the planned project terminal evaluation in the UNDP Country Office evaluation plan and will upload the final terminal evaluation report in English and the corresponding management response to the UNDP Evaluation Resource Centre (ERC). Once uploaded to the ERC, the UNDP IEO will undertake a quality assessment and validate the findings and ratings in the TE report and rate the quality of the TE report. The UNDP IEO assessment report will be sent to the GEF IEO along with the project terminal evaluation report.

Final Report: The project?s terminal GEF PIR along with the terminal evaluation (TE) 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 lessons learned and opportunities for scaling up.

## Exhibit 11 Monitoring and evaluation plan and budget

**Monitoring and Evaluation Budget for project execution:**

Total budget for the M&E is USD 98,396 and this M&E budget provides a breakdown of costs for M&E activities to be led by the Project Management Unit during project implementation. These costs are equivalent to those of the M&E Component of the Results Framework and TBWP. Other project M&E activities can be added to this budget if they are included under the M&E component of the results framework. The oversight and participation of the UNDP Country Office/Regional technical advisors/HQ Units in these M&E activities and in performing standard UNDP M&E requirements are not included as these are covered by the GEF Fee.

| GEF M&E requirements to be undertaken by Project Management Unit (PMU) | **Indicative costs (US$)** | **Time frame** |
|---|---|---|
| Inception Workshop and Report | 3,500 | Inception Workshop within 2 months of the First Disbursement |
| M&E required to report on progress made in reaching GEF core indicators and project results included in the project results framework | 9,963 | Annually and at mid-point and closure. |
| Preparation of the annual GEF Project Implementation Report (PIR) | None | Annually typically between June-August |
| Monitoring of all risks | None | On-going. |
| Supervision missions | None | Annually |
| Learning missions | None | As needed |

| GEF M&E requirements to be undertaken by Project Management Unit (PMU) | **Indicative costs (US$)** | **Time frame** |
|---|---|---|
| Independent Mid-term Review (MTR) | 30,395 | See cover page |
| Independent Terminal Evaluation (TE): | 30,395 | See cover page |
| Final Project Workshop | 3,500 | Before project closure |

[1] See https://www.thegef.org/gef/policies_guidelines

**10. Benefits**

**Describe the socioeconomic benefits to be delivered by the project at the national and local levels, as appropriate. How do these benefits translate in supporting the achievement of global environment benefits (GEF Trust Fund) or adaptation benefits (LDCF/SCCF)?**

The Project will provide direct employment (involved in implementation of NZE options) as well as indirect employment (e.g., development of supply chains of NZE-linked services, good sand equipment). Socioeconomic development and climate change are intricately linked, with social and economic activities climate forcing and climate change determining climate impacts which in turn affect socioeconomic developments. For example, the realization of net-zero buildings will have both global environmental and local socio-economic impacts. Similarly, adding grey water recycling and re-use to NZEB will strengthen the country?s climate change adaptation efforts (i.e. mitigation potable water scarcity). Seeing both the direct environmental (cleaner development) and socioeconomic benefits (new skilled jobs and better services; avoided fuel imports) will attract private and public developers and eventually transform the market into self-sustained growth.

The National Strategy on Climate Change the Government of Turkmenistan identifies the housing sector (along with other high GHG emitting sectors) as one of the priority areas for reducing GHG emissions that will help to achieve its commitments within the Paris Agreement. Contemporary, multi-unit, high-rise apartment buildings have been built in the past two decades. These buildings have a reinforced concrete structure and use mineral wool insulation and a marble fa?ade to reduce heat loss. They rely largely on free-standing, building-level, or multi-building gas boilers for heat and hot water, and building-level or multi-building chillers for cooling Currently, Turkmenistan?s power is generated in ten plants, almost solely from natural gas (1.18 TWh in 2021). Construction of NZE building will help to reduce natural consumption both in terms of fuel use (for heating) and for power generation (by lowering electricity use in heating, ventilation and cooling).

## 11. Environmental and Social Safeguard (ESS) Risks

Provide information on the identified environmental and social risks and potential impacts associated with the project/program based on your organization's ESS systems and procedures

**Overall Project/Program Risk Classification***

| PIF | CEO Endorsement/Approval | MTR | TE |
|---|---|---|---|
| Medium/Moderate | Medium/Moderate | | |

**Measures to address identified risks and impacts**

Elaborate on the types and risk classifications/ratings of any identified environmental and social risks and impacts (considering the GEF ESS Minimum Standards) and any measures undertaken as well as planned management measures to address these risks during implementation.

| **QUESTION 2: What are the Potential Social and Environmental Risks?**<br><br>*Note: Complete SESP Attachment 1 before responding to Question 2.* | **QUESTION 3: What is the level of significance of the potential social and environmental risks?**<br><br>*Note: Respond to Questions 4 and 5 below before proceeding to Question 6.* | | | **QUESTION 6: Describe the assessment and management measures for each risk rated Moderate, Substantial or High.** |
|---|---|---|---|---|
| ***Risk Description***<br><br>***(broken down by event, cause, impact)*** | ***Impact and Likelihood (1-5)*** | ***Significance***<br><br>***(Low, Moderate Substantial, High)*** | ***Comments (optional)*** | ***Description of assessment and management measures for risks rated as Moderate, Substantial or High*** |

| | | | | |
|---|---|---|---|---|
| **Risk 1:** Construction related to applying energy-saving infrastructure, technologies and equipment may have negative environmental, social and health impacts, if not designed, and constructed properly<br><br>S 1.3, 1.7<br><br>S 2.2, 2.3, 2.4<br><br>S 3.1, 3.2, 3.5, 3.7, 3.8<br><br>S 7.1, 7.2, 7.5, 7.6<br><br>S 8.1, 8.2, 8.3, 8.6 | I=3<br><br>L=3 | **Moderate** | This risk arises especially in activities related to the selection, tendering and application of energy-saving materials, infrastructure, technologies and equipment in the two pilot NZE buildings (Output 1.1)<br><br>The project?s pilot activity on outfitting buildings with energy-saving and measurement equipment will be relatively small in scale, however, introducing these technologies will be carried out as part of the construction of new buildings. Construction of new NZEB buildings is included as one of the outputs of the project. Therefore, full-scale environmental and social impact assessment will be required.<br><br>Examples of potential environmental and health related risks, especially for surrounding communities are: dust and noise generation, vehicle and machines emissions, generation of | Following the requirements of the national Law on Environmental Expertise (2014), process of Environmental Impact Assessment will be applied to buildings construction, including the design and application of the energy-saving technologies and solutions.<br><br>To ensure that the national EIA process adheres to the UNDP SES requirements all construction projects subject to domestic EIA will be screened for the applicable UNDP SES standards, prior to the initiation of each EIA process. Process of the combined national EIA and UNDP ESIA will be described in the ESMF.<br><br>Environmental and social impact assessment will include recommendations for the mitigation of local environmental and social risks. Besides the other issues, the pilot buildings? ESIAs will include adequate resource efficiency and waste management plan, hazardous materials management and disposal etc. During the building design process (implementation stage), the characteristics of each building will be assessed to identify the possible hazardous materials, as need be. For the construction phase, the ESIA will address good housekeeping, (ii) emissions (including dust, noise, etc.) control, and (iii) proper waste management including hazardous, solid, |

| | | | | |
|---|---|---|---|---|
| | | | construction waste including oil, grease, hydrocarbons, old electrical appliances, lead-based paints, etc.<br><br>Health of future tenants may be affected by the quality of indoor environment (from applying toxic materials, containing for volatile organic compounds (VOC) and formaldehyde\| or by improper ventilation. | and construction waste management.<br><br>It should be noted that air ventilation is an integral part of the NZE design (see Annex G). Concerning new buildings only, asbestos is not be used, since its use of is forbidden in Turkmenistan (since 2001 as per Building Code on roofs and rooftops ? SNT 2.03.10-01). In any case, the technical design will scrutinize the: impact on health from applying toxic materials, containing volatile organic compounds (VOC) and formaldehyde.<br><br>During the implementation, the construction companies will be selected through an international tendering process, which will require preparation of the EIA study. r Detailed requirements will be specified in the tenders following international standards and best practices (the most stringent one will be applied). The responsible parties shall confirm that:<br><br>? Construction projects comply with applicable national construction norms/building codes and standards as well as international best practices. The same applies to electric systems (installation of photovoltaic systems, solar heating systems, and the installation of LED lighting systems inside and outside of buildings).<br><br>? Works will be implemented and maintained by the legally registered contractor(s) having relevant |

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| | | | | permits for the relevant works. Proof of experience and track record will be required from the contractor(s) prior to the award of the retrofit work.<br><br>? Contractor(s) will be required to conduct orientation and training for workers on EE building retrofits, particularly multi-apartment buildings and public buildings.<br><br>The contractors will be required to implement the Code of Conduct (CoC). |

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| **Risk 2:** Occupational health and safety arrangements during the construction works and that the employment opportunities provided by the project may fail to comply with national and international labour standards<br><br>Standard 7 | I = 4<br><br>L = 2 | **Moderate** | This risk is primarily applicable to Output 1.1, where construction work is expected but also to all other project activities.<br><br>This risk is not fundamentally different from the risks associated with any other ongoing construction works, including the management of materials, waste and handling heavy machinery, but in any case, will be properly monitored and managed during the project implementation stage.<br><br>. | Responsible party agreements/letter of agreements will include requirement to oblige contractors to comply with the national and international labour and working conditions standards, including the occupational health and safety. Procedures will be put in place after project inception. ESMF will include an Occupational Health Management Protocol f in compliance with the national legislation, complemented by the provisions of the Labour Management Procedure to comply with the SES and International Labour Standards<br><br>Such requirements should include, but not necessarily be limited to the following:<br><br>? Provisions for a full occupational safety plan and training in advance of any construction, plus inspections in accordance with and possibly beyond existing national occupational health and safety regulations<br><br>? Provisions to inform construction workers about what wastes are hazardous and therefore should be handled separately from other waste streams.<br><br>? Procedures to avoid the working conditions not meeting the national labour laws and international commitments, and in denial of freedom of association and collective bargaining, use of child labour, forced labour, to discrimination against women considering |

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| | | | | that construction activities are dominated by men labour. |
| **Risk 3:** Increases of greenhouse gas emissions or other drivers of climate change due to ?rebound effects? s in newly built complexes. | I = 3<br><br>L =2 | **Moderate** | This risk is applicable mainly to Output 3.2 on capacity development and awareness creation. Due to the higher energy efficiency of the residential buildings, residents' energy bills on heating and cooling may drop and use the freed resources to heat at higher and cool at lower temperatures or on purchasing additional energy consumers, such as larger refrigerators or more powerful indoor lighting devices | Such ?rebound effects? (putting appliances at higher cooling or heating levels or using oversized consumer appliances) will be addressed by the Project Team during training sessions with residents and via information campaigns in the media and on-site information boards.<br><br>Reference to awareness raising and capacity development of the residents too shall be clearly included in the project document, in Output 3.2. |
| **Risk 4:** The design of building construction might not consider access to the buildings by people with disabilities<br><br>Principle: P1-P5 | I=3<br><br>L=3 | **Moderate** | There could be a risk that buildings are constructed in a way that makes or keeps them inaccessible to persons with disabilities. | There is a probability that the design of the four pilot buildings (Output 1.1) might omit the design on the accessibility by persons with disabilities and that the project might exacerbate the problem. The Project team will only have the mandate to improve the energy efficiency qualities of the building's design and will have to leverage over broader buildings design features.<br>During project development and the building design process, the buildings will be screened concerning accessibility by persons with disabilities to ensure that the project does not accentuate this issue in any way. |

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| **Risk 5**: Project activity to promote increased participation of women in the construction sector exposes women to increased risks of employment related discrimination and workplace harassment<br><br>Principle: 8-9-10-12 | I=3<br><br>L=2 | **Low** | Participation of women in the construction sector is a nascent but growing trend in Turkmenistan. What is the cause of concern is the difficulty in the equitable distribution of high-value activities to women workers/employees. | In its promotion of increased participation of women in the supported construction and maintenance-related project activities, the project will not encourage informal hires, but rather specifically aim at bringing women out from the grey sector into the fully contracted environment with prior know-your-rights training delivered to interested candidates. This will apply both to the pilot buildings and the new urban developments (new Ashgabat city; Arkadag) as a whole, and to related goods/materials and equipment/services supply chains.<br><br>This risk might apply to all project activities. Gender Analysis (see Annex HHHH) assesses and presents the status of the women working in the public building/construction sector and their capacity to participate in decision-making or other processes. The gender action plan outlines management measures for this and lists any other gender risks as well as opportunities to involve women in/through the project. Standard Codes of Conduct will be adhered to that address measures on prevention of Sexual Exploitation and Abuse/Sexual Harassment (SEA/SH). |

[1] Including, inter alia., requirements for employment and working conditions, implementing adequate occupational health and safety

measures (including emergency preparedness and response measures), promoting equal opportunities for work

**Supporting Documents**

Upload available ESS supporting documents.

| Title | Module | Submitted |
|---|---|---|
| **ANNEX L SESP** | **CEO Endorsement ESS** | |
| **6692_preSESP_TKM_EE in Construction Sector_11 Apr_2022_cleared** | **Project PIF ESS** | |

## ANNEX A: PROJECT RESULTS FRAMEWORK (either copy and paste here the framework from the Agency document, or provide reference to the page in the project document where the framework could be found).

*) Gender-sensitive indicators. For additional gender-specific indicators, see Annex J

**) Electricity substitution by 16,805 MWh(e) (at plant?s gate) and 380.128 MWh(th) resulting from savings in natural direct use and substitution by electricity. Together, these result in total avoided natural gas use due to energy savings of 952,866,000 MJ and avoided use of natural gas (substitution by solar energy) in power generation of 627,342,000 MJ, giving total natural gas energy savings of 1,580,208,000 MJ. Details of calculations and assumptions are provided in Annex H.

***) For example, energy performance (residential low-rise and high-rise), energy performance (office, public), construction thermal engineering (envelope), climatology, share of renewable energy, etc. Elaboration and implementation of NZEB-relevant building codes is responsible for part of the direct emission reduction (81.6 $tCO_2$, associated with 262,440 $m_3$ of NZEB floor space, realized or approved before the end of the Project) and indirect emission reduction (760.5 $tCO_2$) post-project, in line with the projections of the (proposed) investment strategy (see Indicator 6).

****) Including assessments NZEB codes and technology options; updated benchmarking

| | **Objective and Outcome Indicators** | **Baseline (2023)** | **Mid-term project (2026)** | **End of Project (EoP) target (2029)** |
|---|---|---|---|---|
| **Project objective**<br><br>To support Turkmenistan?s low carbon development in the achievement of climate mitigation goals by reducing GHG emissions from multi-family | 1) Lifetime greenhouse gas emissions mitigated [tCO?2? lifetime reduction ? direct and indirect] | Zero by default | Pilot building (02): direct GHG ER: 5.3 $tCO_2$ | Direct lifetime emission reduction (ER) of 86.9 $ktCO_2(eq)$, (pilot buildings and constructions in investment plan)<br><br>Calculations are provided Annex G).<br><br>Indirect ER = 760.5 $ktCO_2$. |
| | 2) Projected lifetime energy savings | Zero by default | Pilot buildings:<br><br>96,078,000 MJ | Lifetime energy savings (linked with direct GHG ER of 1,580,208,000 MJ of natural gas ** |

| | Objective and Outcome Indicators | Baseline (2023) | Mid-term project (2026) | End of Project (EoP) target (2029) |
|---|---|---|---|---|
| residential (and public) buildings | 3) Number of direct beneficiaries (disaggregated) as co-benefit of GEF investment * | Zero, since the project has not yet started | 1114 beneficiaries (120pilot building occupants and 654 workers; 340 capacity building) | Total of 8,440 beneficiaries (3,671women) based on (see Annex G): 7,820 direct building beneficiaries and 620 direct beneficiaries of TEESB?s capacity-building and awareness activities |
| | 4) Increase in installed solar PV capacity kW -solar ? MWh battery] | Negligible PV integration in modern building design | Solar PV on two pilot buildings (0.11 MW) | Solar PV (2.10 MW, associated with direct GHG emission reduction). See Annex G |
| **Component 1** | **Piloting energy efficient technologies and EMIS in residential and public buildings** | | | |
| **Outcome 1**<br><br>Nearly-zero energy (NZE) options demonstrated (through advanced building envelope upgrades and renewables) with information systems installed and tested | 1) Number of NZEB designed and constructed with expected energy savings/substitution | No NZEB in Turkmenistan | Two buildings designed and constructed (pilots); one office, one residential | Two pilot NZEB constructed (total floor space of 16,740 m2) and energy performance measured with combined lifetime natural gas avoidance of 26,688 MWh (direct fuel and avoided power generation) |
| | 2) Total floor space of multi-unit residential and public NZEB planned with expected energy (natural gas) savings | Zero by default | 16,740 m3 (pilot buildings) | NZEB investment strategy in accordance with new (proposed NZEB codes, see Indicator 7) aiming at total floor space (approved to be) constructed of 279,180 m2 by the end of the project *** |

| | Objective and Outcome Indicators | Baseline (2023) | Mid-term project (2026) | End of Project (EoP) target (2029) |
|---|---|---|---|---|
| **Outputs, Outcome 1** | 1.1 Investment in nearly-zero energy (NZE) measure and information systems in public and multi-family residential pilot buildings<br><br>1.2 Energy performance of NZEB pilot buildings assessed and compared with reference buildings<br><br>1.3 Public investment plan for NZEB-type high-rise construction (submitted for adoption to the Government before the end of the Project) | | | |
| **Component 2** | **Policy, regulations and institutional mechanism for energy efficient buildings sector** | | | |
| **Outcome 2**<br><br>NZEB construction design regulations proposed with strengthened institutional framework and enforcement policy | 1) Building codes updated towards NZE performance | Current set of energy-relevant buildings (roofs, residential buildings, building thermal engineering, climatology) was formulated during EERB project and approved 2020 | Assessment studies for code updating carried out **** | Five codes updated and proposed for endorsement and at least two codes approved*** |
| | 2) Developed roadmap for building code revision to mandate more energy-efficient building design | No roadmap for updating and institutionalisation of building code analysis, design and MVE (monitoring, verification and enforcement) | 0 | One roadmap formulated for implementation of new building codes (updated towards NZE) |
| | 3) Status of the policy-institutional framework for NZEB-type codes and MVE | | Unit set up for building code monitoring, updating and MVE | Unit operational for building code monitoring, updating and MVE and roadmap implementation) |
| **Outputs, Outcome 2** | 2.1 White papers prepared on the real cost of fossil fuel subsidies to the public budget and on cost-effective means of reducing energy consumption in the building sector<br><br>2.2 NZEB-compatible design criteria developed for buildings and current building codes updated<br><br>2.3 National NZEB plan proposed (including recommended actions for enforcement and verification of Turkmenistan?s building code) | | | |
| **Component 3** | **Digital, knowledge management** | | | |

| | Objective and Outcome Indicators | Baseline (2023) | Mid-term project (2026) | End of Project (EoP) target (2029) |
|---|---|---|---|---|
| **Outcome 3**<br><br>Strengthened and better-informed stakeholders on state-of-the-art construction in buildings and compliance with new building codes | 5) Awareness and capacity of government staff and practitioners on NZEB options and benefits are increased | Existing capacity at R&D and academic institutes. Awareness has been raised and capacity built during EERB project but not on NZE (and the latest technology advances and integration of renewables in buildings) | Gender-sensitive and socially inclusive knowledge plan is updated at project inception. The capacity of targeted recipients is assessed by a survey towards the end of year 2, and an average score of at least 2 is achieved | The awareness and capacity of targeted recipients significantly improved (as assessed by the survey, including gender and social inclusion aspects) towards the end of the project with an average score of at least 4 (out of five) |
| | 6) Number of staff and practitioners participating in capacity building (and % of women) * | | 340 | 620 (35% women) |
| | 7) Dedicated website and information depository on green and NZEB buildings | No easy access to NZEB information due to limitations in Internet access | Website established and managed by Institute | Website and online information repository on NZEB and regularly updated. Case studies, technical materials and advocacy messages (including economic, environmental and social benefits) produced and available online. |
| **Outputs, Outcome 3** | 3.1 Life-cycle-cost assessment methodologies are introduced and operationalized<br><br>3.2 Increased capacity and knowledge of government officials and other stakeholders on NZEB construction planning, assessments, monitoring and evaluation | | | |

| | Objective and Outcome Indicators | Baseline (2023) | Mid-term project (2026) | End of Project (EoP) target (2029) |
|---|---|---|---|---|
| **Component 4** | **Monitoring and evaluation (M&E)** | | | |
| M&E implemented | 13) Status of M&E plan | 0 | M&E Plan implemented according to timeframe given in Exhibit 11) | M&E Plan implemented according to timeframe given in Exhibit 11) |
| **Output, Outcome 5** | 4.1 Mandatory M&E and reporting | | | |

## ANNEX B: RESPONSES TO PROJECT REVIEWS (from GEF Secretariat and GEF Agencies, and Responses to Comments from Council at work program inclusion and the Convention Secretariat and STAP at PIF).

**Comments GEF Council at PIF stage**

| Country | Response |
|---|---|
| **Germany** | |
| 1. Germany recommends including a pilot in Component 1, which demonstrates costs involved and gains for energy efficiency to modernize or retrofit existing private and public buildings to a nearly zero-energy standard | The two pilots are described in detail in the main text with energy savings and substitution details given in Annex G. This cover multi-floor residential as well as office buildings. Retrofitting is outside the scope of TEESB |
| 2. The aspect of sustainable and local building materials should be strengthened in the project design and implementation, as it is a crucial factor for the overall energy and CO2 balance during the living cycle of a building. | For this reason, Output 3.1 (Lifecycle cost and carbon assessment methodologies are introduced) includes activity 3.1.2 on embodied emissions from materials |

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| 3. The local level of government should be strengthened. Climate-sensitive planning, which for example plans the construction of new buildings, their height, orientation, and design in relation to cold air corridors, green and blue infrastructure as well as social infrastructure, can contribute significantly to energy and CO2 reduction. Therefore, sustainable urban planning should be considered more in the project design. | Passive energy and climate-sensitive building will be part of the capacity strengthening and training activities of Output 3.2 (government, architects, planners).<br><br>As such, however, sustainable urban planning itself as an activity is outside the scope, but has links with the UNDP/GEF project ?Sustainable Cities in Turkmenistan: Integrated Green Urban Development in Ashgabat and Avaza? (GEF Project ID # 9279) |
| 4. Also, the aspect of climate adaptation and resilience can be addressed in more detail. | Climate risks might affect the implementation of the projects due to prolonged periods of extreme heat in the summertime when no installation work might be undertaken due to hostile working conditions for manual labour in an unconditioned environment. This will be taken into account in the SESP/labour management plans of the pilot/demo activities. Buildings are usually designed to maintain continued operation during disasters, through structurally robust walls and roofs that can withstand seismic and extreme weather events.<br><br>By investing in rainwater harvesting and where suitable enhanced use of grey water, the project can support adaptation to drought. For this reason, the technology is proposed to be applied in the pilot NZE office/public building (see Annex G for a description) |
| **Switzerland** | |
| 5. Does the project plan on considering thermal comfort as one of the indicators to be measured in order to support follow-up decisions and new standards for upscaling? | The project does make assumptions on indoor temperature. These will be looked at in Output 1.2 (energy performance and SES assessment, so these will be an indicator. |
| 6. Does the project plan on engaging other actors including the new city administration, planners, engineers and involve public participation in order to make the entire new city more energy efficient and better adapted to climate impacts? In our assessment such a city-wide approach will promote innovation and increase the project?s replication and demonstration potential. | Climate-sensitive planning, which for example plans the construction of new buildings, their height, orientation, and design in relation to cold air corridors, green and blue infrastructure as well as social infrastructure, can contribute significantly to energy and CO2 reduction. Therefore, the project will seek to strengthen links with sustainable urban planning. TEESB will coordinate the project with other ongoing GEF Sustainable Cities project in order to expand the impact of EE project to city-level planning as part of the capacity building activities (Output 3.2). This nis important as in Turkmenistan planning is often in large urban development projects (like Arkadag) rather than individual buildings. |

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| 7. Does the project consider RE production, namely off-grid solar power? In our assessment the project (design) would be greatly if it (showed how it helps) boost(ed) the use of solar energy, reduce(ed) urban heat island effect and promote(d) climate- smart city concepts that result in dual mitigation and adaptation benefits. | Yes, while NZE efficiency reduces energy demand considerably, large part of residual demand?s carbon emissions will offset by using solar PV. On urban effect, see also the previous comment |
| 8. How does the project plan on mitigating the risk that the 2 new buildings are built among the last ones, beyond the GEF project duration? In our assessment it would be important to ensure that the two projects are implemented early and can thus have a lighthouse effect for the entire area development. | The two pilots are to be constructed by mid-term also to be able to evaluate and assess the energy performance (at least over a one-year period) |
| **UK** | |
| 9. While the project is focused on domestic emissions Turkmenistan has other more impactful emissions (e.g. methane) it would be helpful if this domestic emissions project could act as a catalyzer for more GoT focus wider emissions reduction. | Emissions from gas production are outside the scope of a project will a limited budget. Energy production, flaring, etc. may be covered by supply-side projects (e.g. funded by ADB or EBRD) |
| **USA** | |
| 10. We are supportive of the objectives of this project, notably the creation of modern building codes and developing a system to do rigorous inspections that includes meaningful penalties and enforcement. However, the project must include training of building inspectors and establishment of a more professional administration for building inspections to ensure successful enforcement of these building codes. | Exactly, so institutionalization is covered by Output 2.3 (institutional setup, including MRV outlined in an ?NZEB plan?, while training is part of this Output as well as Activity 3.2.2 (training government officials). However, for training to be effective the right institution setup needs to be defined, including enforcement authority. |
| 11. We would also encourage the project developers to consider how this pilot program can be scaled across the country. | This will be described in Output 1.3 (NZEB strategy) that should also indicate budgets from Ministries for NZEB building expansion |

**b) Comments STAP at PIF stage**

This project takes a multifaceted approach to improving the energy efficiency of buildings in Turkmenistan by considering governance and subsidy reform alongside technological solutions to building retrofitting. We appreciate that the PIF references STAP Guidance (C.56/Inf.04) on achieving sustainable outcomes and also mentions the theory of change. However, a diagram which lays this out could sharpen the connections between interventions and outcomes.

*Response: Theory of change diagram has been added*

In reviewing earlier GEF work in the country, it is worth noting that there was an important energy efficiency project linked to sustainable water delivery in Turkmenistan under the auspices of UNDP (https://www.thegef.org/projects-operations/projects/5536 ). The current project proponents should consider the lessons learned from that project and its applications. UNDP recently conducted a symposium on this topic in May 2022, and some of the scientific insights ensuing from this symposium should also be incorporated into the project design (https://www.undp.org/turkmenistan/press-releases/undp-promotes-renewable-energy-and-energy-efficiency-turkmenistan).

The World Bank had undertaken a much broader study almost a decade ago on success stories of energy efficiency in former Soviet-bloc countries referenced below. These lessons also should be incorporated and then linked to any specific innovations in this project (Stuggins, G., Sharabaroff, A., Semikolenova, Y., 2013. Energy Efficiency: lessons learned from success stories, Eastern Europe and Central Asia reports. THE WORLD BANK, Washington. https://doi.org/10.1596/978-0-8213-9803-6).

*Response: These references have been noted, while also recent literature on NZEB has been reviewed*

The proposal needs to clarify whether the project will focus on upgrading existing buildings or building new ones. In some instances, the PIF indicates that the project will upgrade existing buildings, while elsewhere, it says new buildings will be constructed. The clarification is essential given that energy efficiency measures will defer for new buildings and retrofitting of existing ones. Further, in considering which type of building to retrofit, Component 1 indicates that "energy efficiency will be achieved through the upgrade of the new buildings to a nearly zero-energy standard." We think that rather than focus on only new buildings, the demonstration should consider the diverse types of buildings predominant in the country that could generate significant GEBs if retrofitted, including old ones. Doing this will ensure that there are examples that can be replicated and scaled up in the future for the different types of buildings.

*Response: TEESB will focus on new buildings only. First, NZEB has to de demonstrated as a viable option, before it can de applied in retrofitting. Also, upgraded codes will apply to new buildings in first instance.*

**a) GEF Secretariat comments**

Please kindly see below the link:

https://www.thegef.org/work-program-documents/c-62-compilation-council-comments

**Comment 1:** Revision or justification of budget for output 3.2 ($230,000)

**Response:** The output 3.2 has been incorporated into output 3.1 (*see description in page 17 of this document*) with an estimated budget of approximately $56,124 ($34,232 direct cost + $21,801 for project team?s involvement related to this output).

**Comment 2:** The engagement of the private sector in co-financing

**Response:** The potential engagement of the private sector players in project activities, including co-financing of the project has been assessed during the PPG phase and a detailed description is provided in sub-section 4: Private sector engagement in page 26 of this document.

**Comment 3:** Detailed analysis and results in KM

**Response:** This comment has been addressed through the Annex K: Stakeholder Engagement Plan, of the UNDP Project Document.

**Comment 4:** The management arrangements, including approaches to addressing domestic constraints on financial translations in Turkmenistan should be further assessed at the PPG phase and presented to GEF SEC

**Response:** The management arrangement with a detailed assessment of domestic constraints related to financial transactions in Turkmenistan has been conducted during the PPG phase and the assessment demonstrated no changes towards improvement of the situation. A Note document with this assessment has been presented to GEF SEC in May, 2023. Also, details of the proposed management arrangements are provided in the related section of the CEO ER documents and the GEF Checklist provided as an annex to the project package.

## ANNEX C: Status of Utilization of Project Preparation Grant (PPG). (Provide detailed funding amount of the PPG activities financing status in the table below:

**PPG Grant Approval at PIF: 100,000**

| | | | | |
|---|---|---|---|---|
| ***Project Preparation Activities Implemented*** | ***GEF Amount ($)*** | | | |
| | ***Budgeted Amount*** | ***Amount Spent to date*** | ***Amount Committed*** | ***Balance*** |

| | | | | |
|---|---|---|---|---|
| Component A: Preparatory Technical Studies & Reviews<br><br>a. Desktop and field-based studies and data collection<br><br>b. Gender Analysis<br><br>c. Social and Environmental Standards: Screening and Assessments<br><br>d. Identification of project sites<br><br>e. Financial planning, co-financing and investment mobilized<br><br>f. Stakeholder analysis<br><br>g. Appraise and formulate the most appropriate project implementation and execution modality<br><br>h. Other required studies | 37,300 | 11,854.35 | | 25,445.65 |
| Component B: Formulation of the NCE VF Project Document, CEO Endorsement Request, and Mandatory and Project Specific Annexes<br><br>a. Stakeholder Engagement Plan<br><br>b. Gender Action Plan and Budget<br><br>c. Social and Environmental Standards: Screening and Management Measures<br><br>d. GEF and LDCF/SCCF Core Indicators<br><br>e. Completion of the required official endorsement letters<br><br>f. Mandatory Annexes<br><br>g. Project Management Arrangements | 57,500 | 16,160 | 22,202.85 | 19,137.15 |
| Component C: Validation Workshop and Report | 5,200 | | | 5,200 |
| **Total** | **100,000** | **28,014.35** | **22,202.85** | **49,782.8** |

## ANNEX D: Project Map(s) and Coordinates

## Please attach the geographical location of the project area, if possible.

The map is provided in Annex E in the CEO ER.
Arkadag (Blue Star) is located west of the city limit of Turkmenistan's capital city, Ashgabat, and east of the neighbouring city of G?kdepe at Lat. 38.07 ? Long. 58.06.

The new Ashgabat City development (Red Star) will be located north of the capital Ashgabat at Lat. 37.96 - Long.58.19.


**Box 1 Artist?s view of future new Ashagat City project**

Source: www.ashgabatcity.gov.tm

**Box 2 Location and layout of Arkadag (Ahal province)**


https://www.openstreetmap.org/#map=11/38.0749/58.1853.

**GEO LOCATION INFORMATION**

**The Location Name, Latitude and Longitude are required fields insofar as an Agency chooses to enter a project location under the set format. The Geo Name ID is required in instances where the location is not exact, such as in the case of a city, as opposed to the exact site of a physical infrastructure. These IDs are available on the GeoNames? geographical database containing millions of placenames and allowing to freely record new ones. The Location & Activity Description fields are optional. Project longitude and**

**latitude must follow the Decimal Degrees WGS84 format and Agencies are encouraged to use at least four decimal points for greater accuracy. Users may add as many locations as appropriate. Web mapping applications such as OpenStreetMap or GeoNames use this format. Consider using a conversion tool as needed, such as:https://coordinates-converter.com Please see the Geocoding User Guide by clicking here.**

| Location Name | Latitude | Longitude | Geo Name ID | Location & Activity Description |
|---|---|---|---|---|
| Arkadag | 38.07 | 58.06 | | |
| Ashgabat | 37.96 | 58.19 | | |

## ANNEX E: Project Budget Table

## Please attach a project budget table.

| Expenditure Category | Detailed Description | Component (USDeq.) | | | | | | Total (USDeq.) | Responsible Entity |
|---|---|---|---|---|---|---|---|---|---|
| | | *Component 1* | *Component 2* | *Component 3* | *Sub-Total* | *M&E* | *PMC* | | (Executing Entity receiving funds from the GEF Agency) [1] |
| | | *Sub-component 1.1* | *Sub-component 2.1* | *Sub-component 3.1* | | | | | |
| **Equipment** | Materials and goods for auditing and energy performance measurements | 22,500 | | | 22,500 | | | 22,500 | UNDP |
| **Equipment** | Information technology and equipment for project activities | | 6,615 | | 6,615 | | | 6,615 | UNDP |

| | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| **Equipment** | Materials and goods on NZEB research and curricula in academic institutions (Com2 and 3) | | 7,500 | 25,000 | 32,500 | | | 32,500 | UNDP |
| **Equipment** | Information Techn equipment for awareness and capacity building activities (Comp 2 and 3) | | | 7,500 | 7,500 | | | 7,500 | UNDP |
| **Contractual Services ? Company** | Company contract awarded to successful bidders in tendering to incorporate NZEB features in two pilot buildings (USD 750,000). Contracts for preceding design/architecture and feasibility studies (USD 70,000) and compilation of investment opportunities in the prospectus (USD 15,000). Contracts for measurements (USD 40,000) | 875,000 | | | 875,000 | | | 875,000 | UNDP |

| | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| **Contractual Services ? Company** | Company contracts fort elaboration of NZEB-related white papers (USD 30,000), assessment of socio-econ benefits NZEB technologies and options (USD 25,000) and elaboration of NZEB roadmap (USD 25,000) (total USD 80,000) | | 80,000 | | 80,000 | | | 80,000 | UNDP |
| **Contractual Services ? Company** | Company contracts for capacity needs assessment (USD 12,000), training design and delivery (government staff, USD 20,000; companies and developers, USD 16,000; academic institutions, USD 21,000) as well as for embodies emissions and lifecycle assessments (USD 21,000) (total USD 90,000) | | | 90,000 | 90,000 | | | 90,000 | UNDP |
| **Contractual Services ? Company** | Contract for measurement of progress indicators (incl. capacity strengthening survey) | | | | | 9,963 | | 9,963 | UNDP |

| | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| **Contractual Services ? Individual** | Tasks of project staff related to technical support Comp.1, including Project manager (19.5% (USD 35,040) of annual salary of USD 179,671), Technical+Pilot Coord (33.3% (USD 50,000) of annual salary of USD 150,000), Social Safeguards and Gender (33.3% (USD 15,000) of total allocation of USD 45,000) - total USD 100,040 as well as Lead Advisor, USD 12,000: (Total related to outputs of Component 1 - USD 112,040) | 112,040 | | | 112,040 | | | 112,040 | UNDP |

| | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| **Contractual Services ? Individual** | Tasks of project staff related to technical support Comp.1, including Project manager (19.5% (USD 35,040) of annual salary of USD 179,671), Technical+Pilot Coord (33.3% (USD 50,000) of annual salary of USD 150,000), Social Safeguards and Gender (33.3% (USD 15,000) of total allocation of USD 45,000) - total USD 100,040 as well as Lead Advisor, USD 12,000: (Total related to outputs of Component 1 - USD 112,040) | | 112,040 | | 112,040 | | | 112,040 | UNDP |

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| **Contractual Services ? Individual** | Tasks of project staff related to technical support Comp.1, including Project manager (18.4% (USD 35,040) of annual salary of USD 179,671), Technical+Pilot Coord (33.3% (USD 50,000) of annual salary of USD 150,000), Social Safeguards and Gender (33.3% (USD 12,000) of total allocation of USD 45,000) - total USD 119,865 as well as Lead Advisor, USD 12,000: (Total related to outputs of Component 1 - USD 112,040) | | | 112,040 | 112,040 | | | 112,040 | UNDP |
| **Contractual Services ? Individual** | Cost of management & administration tasks (project manager - USD 40,195 = 22.4% of annual salary of USD 179,671 and fin-admin assistant - 27,210=66.6% of annual salary of USD 40,856 - 50% (part time) engagement). Total USD 67,405 | | | | - | | 67,405 | 67,405 | UNDP |
| **Sub-contract to executing partner** | | | | | - | | | - | UNDP |

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| **International Consultants** | International consultancy (8 weeks @ 3750/week, incl. international travel) for selected pilot/demo selection and design; elaboration of NZEB investment plan and participation in related workshops/events | 30,000 | | | 30,000 | | | 30,000 | UNDP |
| **International Consultants** | International consultancy (14 weeks @ 3750/week, incl. international travel) for energy building upgrading to NZEB level and NZEB governance (total USD 52,500) | | 52,500 | | 52,500 | | | 52,500 | UNDP |
| **International Consultants** | International consultancy (09 weeks @ 3750/week, incl. international travel) to support lifecycle cost assessments and capacity strengthening activities (total USD 33,750) | | | 33,750 | 33,750 | | | 33,750 | UNDP |

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| **International Consultants** | Budget for consultancy and travel for final evaluation and MTR.) is USD 60,790, which is divided as indicated over budget lines 27 to 29. Budget note 27: international consultancy (USD 45,000) | | | | | 45,000 | | 45,000 | UNDP |

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| **Local Consultants** | National consultancy to support international consultant (20 weeks @ 1300/week) or selected pilot/demo selection and design; elaboration of NZEB investment plan and participation in related workshops/events. In addition, national consultancy for social-environmental impact assessment of the two pilot buildings (USD 30,000) and social-environmental screening of the investment prospectus (USD 20,000) | 76,000 | | | 76,000 | | | 76,000 | UNDP |

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| **Local Consultants** | Local consultancy (30 weeks @ USD 1300/week) for energy building upgrading to NZEB level and NZEB governance (institutional; enforcement, verification, monitoring) (total USD 39,000) | | 39,000 | | 39,000 | | | 39,000 | UNDP |
| **Local onsultants** | Local consultancy (15 weeks @ USD 1300/week) to support lifecycle cost assessments and capacity strengthening activities (total USD 19,500) | | | 19,500 | 19,500 | | | 19,500 | UNDP |
| **Local Consultants** | National consultancy for MTR and TE (USD 13,000) | | | | | 13,000 | | 13,000 | UNDP |
| **Trainings, Workshops, Meetings** | Workshops and seminars (08 event.days @ USD 3500/day) related to Component 2 activities (all USD 28,000) | 28,000 | | | 28,000 | | | 28,000 | UNDP |
| **Trainings, Workshops, Meetings** | Workshops and seminars (08 event.days @ USD 3500/day) related to Component 2 activities (all USD 28,000) | | 28,000 | | 28,000 | | | 28,000 | UNDP |

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|---|---|---|---|---|---|---|---|---|---|
| **Trainings, Workshops, Meetings** | Awareness workshop (06 event.days @ USD 3500/day) related to Component 3 activities and budget for three training courses hosted by selected training/academic institutions (all USD 81,000) | | | 81,000 | 81,000 | | | 81,000 | UNDP |
| **Trainings, Workshops, Meetings** | Inception (and/or final project) workshops (USD 3500 each; USD 7000 total) | | | | - | 7,000 | | 7,000 | UNDP |
| **Travel** | Travel for short-term consultants (and staff but excl. international. ticket of international. experts, in BuLi 71200) | 3,126 | | | 3,126 | | | 3,126 | UNDP |
| **Travel** | Travel for short-term consultants (and staff but excl. international. ticket of international. experts, in BuLi 71200) | | 4,953 | | 4,953 | | | 4,953 | UNDP |

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|---|---|---|---|---|---|---|---|---|---|
| **Travel** | Travel for short-term consultants (and staff but excl. international. ticket of international. experts, in BuLi 71200) of USD 10,205 as well as USD 15,000 for participation in study tour and for international events (in and outside Turkmenistan) | | | 25,205 | 25,205 | | | 25,205 | UNDP |
| **Travel** | Travel MTR and TE (USD 2,790) | | | | | 2,790 | | 2,790 | UNDP |
| **Travel** | Travel project staff | | | | | | 4,475 | 4,475 | UNDP |
| **Office Supplies** | Project management cost: office supplies | | | | | | 6,495 | 6,495 | UNDP |
| **Other Operating Costs** | AV and printing cost (studies, workshops, reports, etc.) in Component 1 (USD 5,175) | 5,175 | | | 5,175 | | | 5,175 | UNDP |
| **Other Operating Costs** | AV and printing cost (newsletters, workshops, reports, etc.) in Component 2 (USD 5,000) | | 5,000 | | 5,000 | | | 5,000 | UNDP |
| **Other Operating Costs** | AV and printing cost (awareness materials, workshops, reports, etc.) in Component 3 | | | 8,761 | 8,761 | | | 8,761 | UNDP |
| **Other Operating Costs** | Professional hired services for project auditing (USD 15,000) | | | | - | | 15,000 | 15,000 | UNDP |
| **Other Operating Costs** | BL 74500 (for bank charges) at USD 5,000 | | | | | | 5,000 | 5,000 | UNDP |

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| **Grand Total** | | **1,147,691** | **336,033** | **406,481** | **1,890,205** | **77,753** | **98,375** | **2,066,333** | |

**ANNEX F: (For NGI only) Termsheet**

Instructions. Please submit an finalized termsheet in this section. The NGI Program Call for Proposals provided a template in Annex A of the Call for Proposals that can be used by the Agency. Agencies can use their own termsheets but must add sections on Currency Risk, Co-financing Ratio and Financial Additionality as defined in the template provided in Annex A of the Call for proposals. Termsheets submitted at CEO endorsement stage should include final terms and conditions of the financing.

**ANNEX G: (For NGI only) Reflows**

Instructions. Please submit a reflows table as provided in Annex B of the NGI Program Call for Proposals and the Trustee excel sheet for reflows (as provided by the Secretariat or the Trustee) in the Document Section of the CEO endorsement. The Agencys is required to quantify any expected financial return/gains/interests earned on non-grant instruments that will be transferred to the GEF Trust Fund as noted in the Guidelines on the Project and Program Cycle Policy. Partner Agencies will be required to comply with the reflows procedures established in their respective Financial Procedures Agreement with the GEF Trustee. Agencies are welcomed to provide assumptions that explain expected financial reflow schedules.

**ANNEX H: (For NGI only) Agency Capacity to generate reflows**

Instructions. The GEF Agency submitting the CEO endorsement request is required to respond to any questions raised as part of the PIF review process that required clarifications on the Agency Capacity to manage reflows. This Annex seeks to demonstrate Agencies? capacity and eligibility to administer NGI resources as established in the Guidelines on the Project and Program Cycle Policy, GEF/C.52/Inf.06/Rev.01, June 9, 2017 (Annex 5).