

UNDP/GEF-4 Project # 4134/4097

Improving Energy Efficiency
in the Residential Buildings Sector
of Turkmenistan

Inception Report

December 2012

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Abbreviations and Acronyms

AWP	Annual Work Plan
CIS	Commonwealth of Independent States
CO	Country Office
DSM	Demand-Side Management
EE	Energy efficiency
EU	European Union
GEF	Global Environmental Facility
GHG	Greenhouse Gas
HVAC	Heating, Ventilation, Air-Conditioning
IBD	Integrated Building Design
ITA	International Technical Advisor
LogFrame	Logical Framework
Q	Quarter
R-value	Thermal resistance value
tCO _{2e}	tons of CO ₂ equivalent
ToR	Terms of Reference
UNDP	United Nations Development Programme
UNDP RTA	UNDP Regional Technical Advisor

I. Introduction

On November 17, 2011 the state concern Turkmengas as an executing agency, and UNDP Turkmenistan as an implementing agency, have agreed to implement and signed a project “Improving Energy Efficiency in the Residential Buildings Sector of Turkmenistan”.

The four-year project received grant funding from GEF of US \$2,516,280 and a combined grant and parallel co-financing from UNDP in the amount of US \$300,000. The project is scheduled to be implemented by the end of 2015.

Local cash co-financing has been estimated to be provided by Turkmengas, Ministry of Construction and the City of Ashgabat as follows: Turkmengas – US \$19.5 million, Ministry of Construction – US \$5.32 million, and City of Ashgabat – US \$17.5 million.

In addition to cash co-financing, in-kind contribution has been planned to be provided by Turkmengas and Ministry of Construction in the total amount of US \$1,067,000, including \$387,000 by Turkmengas and \$680,000 by the Ministry of Construction.

The project objective is to *reduce greenhouse gas emissions by improving energy management and reducing energy consumption in the residential sector in Turkmenistan.*

The project has been designed to:

- strengthen capacity and regulations on the design and construction of highly energy-efficient buildings,
- develop capacity at Turkmengas and other national agencies to identify end-use energy savings in its housing stock and implement investments to reduce end-use energy consumption,
- introduce improved highly-efficient design measures to major housing designers and developers, and
- replicate these measures through protocols for energy-saving measures in prototype buildings and through mainstreaming EE issues into state construction and housing policies and programs.

The project is structured into four project components:

- I. Energy efficient building codes and supporting capacity strengthening
Strengthened requirements for building energy performance and revision of existing energy efficiency building code, introduction of building energy passports
- II. Demand-Side Management : partnership with Turkmengas
Energy audits and DSM analysis of cost-effective potential for energy savings measures in residential buildings, and an energy efficiency investment plan developed
- III. Improved design measures for major residential consumers
Energy efficient pilot buildings: at least three newly designed and constructed energy efficient residential buildings, at least three existing residential buildings newly reconstructed to be more energy efficient and pilot buildings energy passports developed

- IV. Replication through training and support for policies that encourage energy efficiency
Training of experts, information and experience disseminated and applied in at least 25 buildings

The purpose of the Inception Report is to analyze current conditions affecting implementation of the project, review the project design and activities implemented since the launch of the project and potentially recommend revisions of project activities and/or project logframe that will measure project achievements.

The Inception Report summarizes project achievements and activities implemented during the inception period from November 2011 through the end of 2012, and presents the project's implementation strategy, work plan and updated Project Results Framework (also called logical framework, or logframe).

II. Situation update

The project has been designed to overcome barriers to energy-efficient housing – both in newly constructed buildings as well as in existing residential buildings. Barriers identified in the project development phase continue to be valid. Strategies to overcome these barriers remain appropriate.

Barriers to more energy efficient housing as specified in the Project Document:

- Payment for gas and power is made by the state (e.g. Turkmen gas provides “free” gas and extremely inexpensive electricity for residential buildings), which means that developers and residents have no financial incentive to pursue energy efficiency
- Lack of legal framework to promote energy efficiency
- Lack of specific policies and programs to improve energy efficiency
- Lack of energy performance guidelines for existing buildings undergoing capital repairs (i.e. reconstruction of the façade and roof of a building).
- Lack of awareness of the potential to save energy by improving efficiency in the housing stock.
- Architects, engineers, and policy-makers have insufficient knowledge and capacities to identify techniques that could be applied to exceed the energy performance of current codes applying to new buildings.
- Architects, engineers, and policy-makers have insufficient knowledge and capacities to identify techniques that could be applied to exceed the energy performance of existing buildings
- Absence of energy performance data from the housing stock (and the building stock more generally)
- Absence of energy auditors who can conduct energy audits and identify opportunities to reduce energy consumption in residential buildings

Government priorities

Since the project preparatory phase, the government of Turkmenistan, including several specific agencies plus Turkmen gas, has continually shown its interest and will to implement the project. Two specific policy developments are of particular note.

- A new National Strategy on Climate Change was adopted by the government of Turkmenistan on June 15, 2012. The National Strategy on Climate Change lists as the first priority area “energy efficiency” and highlights “housing” as one of four key sectors in the economy to address limitation of greenhouse gas emissions. The high political support to the National Strategy on Climate Change illustrates the statement of the President of Turkmenistan, Mr. Gurbanguly Berdimuhamedov, who stressed that “environmental protection and ecological safety is one of the priorities of Turkmenistan's state policy” (Source: UNDP Turkmenistan news archive, “Turkmenistan adopts National Strategy on Climate Change”, July 11, 2012).

- The Ministry of Construction of Turkmenistan has stated its intentions to develop a new building code on thermal performance of buildings, and also to revise existing building codes on roofs and roofing, residential buildings, and building climatology. The Ministry has accepted the project's offer of technical assistance in this work.

Current market trends in residential re/construction

- The construction of high-rise multiapartment buildings in new Ashgabat continues, although no concrete long-term plans exist that would specify the number of buildings/apartments to be constructed annually. One-year investment plans are prepared and approved on an annual basis. The scale of construction of new residential buildings is expected to continue in about the same magnitude as in past years. In 2012 nine new "elite" multiapartment buildings with individual design that have in total 877 apartments with a total area of 96 000 m² are constructed annually (110 m² per apartment on average). These new "elite" buildings are individually designed and should comply with the existing building code SNT 2.01.03-98 of 1998. Additional eleven multiapartment prefabricated panel buildings with typical design are constructed annually with 1 044 apartments and a total area of 73 000 m² (70 m² per average apartment). It is not clear if these newly built prefabricated panel buildings comply with the building code SNT 2.01.03-98 of 1998, or an earlier building code that was in place in time of the panel building design only.
- Reconstruction of existing residential buildings in Ashgabat (built from the 1950s through the 1990s) has been accelerated over the last two years. However, the reconstruction of buildings primarily alongside main streets includes typically only improvement of their appearance, but no energy efficiency measures such as building insulation and shading is implemented. A typical building reconstruction includes reconstruction of the façade, new façade plastering and painting, removal of air-conditioners and satellite dishes from the street facing façade, and in some cases reconstruction/replacement of roof. The only measure that improves energy performance of reconstructed buildings is a replacement of old windows with new plastic framed double glazed windows. Averted sides of buildings and buildings inside micro-blocks not facing main streets remain so far often not reconstructed.

Renovation of state-owned residential buildings is carried out under the Ministry of Communal Services. The state-supported renovation program for 2013 will include about 50 buildings; the Ministry has promised to support the inclusion of the three buildings chosen by the project as renovation pilots in this 2013 program.

- The old inefficient and insufficient centralized district heating scheme that supplied old and prefabricated residential buildings has been already partially replaced in some locations with new decentralized district heating boiler houses supplying with heat and hot water several multiapartment buildings.

- New “elite” high-rise multiapartment buildings are typically supplied by heat for space heating and cold for air-conditioning from a building level heat boiler house.
- Heat is generated typically from heat only boilers and has metered natural gas consumption. Heat produced and delivered to individual buildings and apartments is not metered but paid on a heated area basis.

Implications for project goal and replication strategy

The project goal to reduce direct emissions by 202,866 tCO_{2e} (or 102,670,709 m³ of natural gas) over a 20-year lifetime has been estimated in the Project Document based on assumed construction of new pilot buildings with a total area of 60,897 m² and a total area of pilot reconstructed buildings of 8,376 m². The assumed area in new pilot buildings thus represents 36% of total area of annually built new residential buildings in Ashgabat.

Energy consumption in a new “elite” residential building with 72 apartments and a total area of 20,299 m² (i.e. total of 282 m² per apartment) was first estimated to be 6,454,272 m³ of natural gas, including space heating, air-conditioning and domestic hot water. Energy savings in new pilot buildings have been estimated to be 25%, i.e. 1,613,568 m³ of natural gas.

The project team has collected information on actual energy consumption in “elite” buildings. A 72 apartment “elite” building has an actual total consumption of 1,198,000 m³ of natural gas used for space heating, air-conditioning and domestic hot water—much lower than initial estimated consumption, and indeed lower even than estimated energy savings, in a new building of similar size.

If commonly applicable to other buildings, this finding of low baseline energy consumption would warrant re-examination of the overall project target for direct energy savings, as it would not be possible to achieve direct emissions reduction of 202,866 tCO_{2e} via three new and three reconstruction pilot projects only. The project plans further data-gathering on baseline energy consumption to clarify this picture, which should be made definitive by the time of Midterm Evaluation.

It should be noted that expanded size and scope of replication of demonstration project results may put the original direct emissions-reduction target within reach even if baseline levels are lower than originally projected. It should also be noted that the target for direct emissions reductions constitutes only about one-sixth of the total target for emissions reductions. Expanded success with indirect energy savings and avoided emissions could compensate if direct results fall short of original targets.

III. Activities performed during the inception period

Since November 2011 till December 2012 the project has implemented following activities:

- The Inception Workshop was held on January 30, 2012 with participation of UNDP CO, UNDP RTA, Turkmengas, and international consultant
- The UNDP CO Low Emission Development Program Component Manager Ms. Irina Atamuradova has been appointed to be responsible for the strategic management of the project
- Mr. Vadim Shmidt was appointed to serve as a Technical Advisor
- First project meeting (Local Program Appraisal Committee meeting) was held on May 11, 2012. At the meeting draft Annual Work Plan was approved as well as establishment of a Steering Committee and an Advisory Committee, and institutional members of the Steering Committee and Advisory Committee have been nominated
- Organizations nominated to serve in the project Steering Committee have been invited to officially nominate and approve their representatives to the Steering Committee
- Organizations nominated to serve in the project Advisory Board have been invited to officially nominate and approve their representatives to the Advisory Board
- Murad Bayramov has been hired as Energy Efficiency Building Code Specialist
- Arslan Zomov has been hired as Energy Audit Specialist
- Myati Akhmedov has been hired as Specialist on Construction of Residential Buildings Project office has been provided by Turkmengas and has been reconstructed, equipped, and occupied by project staff
- Selection criteria for pilot sites for construction of new buildings and existing buildings subject to retrofitting have been developed
- 3 new buildings and 3 retrofits have been preliminarily selected and proposed for negotiations with key Ministry of Municipal Services and Ashgabat City Administration
- A draft of methodology of base line energy consumption in pilot buildings has been prepared
- Energy audits of 3 existing buildings have been prepared
- After negotiations with Turkmengas, the Ministry of Energy and Industry, and the Ministry of Communal Services, heat and electricity meters have been installed in the 3 existing buildings chosen for retrofit, as well as 3 neighboring buildings that will serve as baselines for comparison
- Draft Inception Report was prepared in February and revised in July 2012
- An international study tour to Germany was conducted, with participation by project team members and representatives of Turkmengas and other key government agencies
- A review of international practice with building codes and certification systems was prepared by project staff
- Mark Chao was hired as International Technical Advisor (ITA) and conducted a mission to Ashgabat in December 2012, coinciding with a meeting of the project's Steering Committee and Technical Advisory Board. These meetings and Chao's overall mission resulted in the drafting of a 2013 work plan, as well as proposed changes to planned outcomes and outputs of the Project Results Framework.

The project Steering Committee is led by Turkmenogas and includes representatives of the following organizations:

1. Turkmenogas
2. Ashgabat Municipality
3. Ministry of Communal Services
4. Ministry of Construction
5. Ministry of Energy and Industry
6. Ministry of Environmental Protection
7. UNDP

The Advisory Board consists of local experts and decision makers representing following organizations:

1. National Parliament - Medjlis
2. Ministry of Economy and Development
3. Turkmenogas
4. Turkmennebitgasgurlushchik (also commonly referred to as Turkmenneftegasstroi – a building design and construction company associated with Turkmenogas)
5. Neftgaskhizmat
6. Ashgabat municipality, Department of Capital Construction
7. Main Department of Architecture and Urban Planning
8. Ashgabataslama Design Institute
9. Ministry of Communal Services
10. Turkmendjemagattaslama Design Institute
11. Ashgabatteplo Heating Utility
12. Ministry of Energy and Industry
13. Ministry of Construction, Department of Main State Expertise (Glavgosexpertise)
14. Ministry of Construction, Department of Architecture, Urban Planning and Science
15. Turkmendovletaslama Design Institute
16. Ministry of Industry of Construction Materials
17. Institute of Strategic Planning and Economic Development
18. Polytechnic Institute (Institute for Architecture and Development)
19. UNDP – Low Emission Development Program Manager
20. Technical Consultant of the Project on improving energy-efficiency in residential buildings sector of Turkmenistan

IV. Implementation strategy

The implementation strategy is based on transfer of best international practice in designing energy efficient housing with standard affordable costs, and cost-effective energy efficiency reconstruction of existing buildings from leading developed countries as well as from similar UNDP projects implemented in countries in the region, and active involvement and hands-on training of local experts supported with experienced international experts.

Component 1: Building codes, policy, and capacity-building

Component 1 of the project focuses on promotion of energy efficiency in buildings beyond the level embodied in existing codes.

Incentive program (Output 1.1) and building codes (Output 1.2)

The original Project Document reflected the opinion of national experts that amending building codes themselves might be too ambitious as an immediate goal. Instead, the Project Document foresaw activities under Component 1 to stimulate voluntary implementation of efficient building design beyond code requirements. Such activities would boost the capacity of building designers and expand the market's ability to demand and deliver more energy-efficient buildings. These changes in the market would in turn help create an enabling environment for more stringent codes to be adopted.

The Project Document frames the passage of building codes in a strongly contingent way, as shown in the excerpts below (bold face added for clarity). Notably, the Project Document sets a target only for adoption of a **roadmap** for revised building codes, but not adoption of the building codes themselves.

- *..[T]his component will focus on encouraging the design and construction of highly-efficient buildings based on regional best practice while **attempting to promote the adoption of more stringent codes** in the near to medium term.*
- *Output 1.2: **Roadmap developed that explores more stringent requirements** for energy performance in buildings and supporting capacity for building code enforcement and revision strengthened*
- *Activity 1.2.4: **Development and adoption by the Ministry of Construction of a roadmap** for scheduled building codes review and revision that explores more stringent requirements for the energy performance of buildings.*

From the Project Results Framework in the original Project Document

Outcome 1:	Indicator	Targets (End of Project)
Energy consumption in new buildings is reduced beyond current requirements	Adopted roadmap for building code revision to mandate more energy efficient building design	Roadmap for building code revision is developed and adopted by the end of the Project
	% improvement in the minimum energy performance requirements of the proposed highly energy-efficient buildings codes	25%

But it has become clear during the Inception Period that conditions and government priorities have changed, and that these changes warrant significant corrections to Component 1. These changes include the following.

- The Ministry of Construction of Turkmenistan has expressed its desire to develop a new building code on thermal performance of buildings (*Thermal Protection of Buildings*), and to revise three building codes that are directly relevant to energy efficiency in residential buildings (*Residential Buildings, Roofs and Roofing, and Building Climatology*).
- Existing practice of energy-efficient building design in Turkmenistan varies widely. Already a significant portion of the market – so-called “elite” multifamily homes, often designed and built with the participation of foreign companies -- is advancing in terms of energy efficiency. Therefore the need for “market pull” incentives to promote best practices in Turkmenistan is less urgent than originally envisioned.
- To be successful, the incentive program articulated as Output 1.1 would require a complex combination of funding, technical development, and administration. Securing needed funding for an incentive program would be highly uncertain and time-consuming. And even if created, it is far from certain that financial incentives would have much of an effect on design and construction practice.
- The project team has observed that incentives for new buildings originally envisioned for Output 1.1 could be integrated with the demand-side management activities of Component 2.

Given these new conditions, the project is shifting the focus of Component 1 away from incentives and long-term transformation of the enabling environment for building codes, and toward the immediate adoption of new and revised building codes themselves. Output 1.1, which called for the development of a program to encourage designers to exceed code requirements, is now consolidated with Component 2. Output 1.2, on new and revised building codes, is now the main element of this component.

Work on Output 1.2 will involve the collection, review, and analysis of information of analogous building codes in Europe, the USA, and the CIS. Then the project team, under the leadership of Energy Efficiency Building Code Specialist Murad Bayramov, will develop drafts of a new code on thermal performance of buildings and energy-related revisions to existing codes on roofs and roofing, residential buildings, and building climatology.

The project team will present the draft codes to the Ministry of Construction and also will help coordinate the solicitation of feedback from experts and officials from outside the Ministry and UNDP. An international expert on building codes engaged as a consultant will help review the draft codes. Revisions will follow. Final versions of all codes are expected to be adopted in the first half of 2014.

It is expected that the new codes will collectively mandate an average reduction of 15-25% in heat energy consumption in residential buildings compared with existing levels. The new thermal

performance code will also incorporate whole-building energy performance requirements, and new documentation requirements (energy passports).

Energy passports (Output 1.3)

The project team, supported by the ITA, will review international experience with adoption of building energy passports and labeling and will develop a proposal on implementation of a local scheme of building energy passports, including methodology of building energy performance calculation and compliance responsibilities and institutional and regulatory setup for enforcement of such scheme. Relevant regulations will be drafted as part of the revised building code or as a separate legislation. The energy passport system is to include a rating system for buildings based on energy performance. This output will also include an assessment and recommendations on application of a labeling system, in which buildings would display a physical label showing the rating and possibly other energy passport information.

The proposed scheme of energy passports will be discussed with and reviewed by relevant local stakeholders and decision makers and the project Advisory Board. After the approval the project team will work with relevant governmental agencies to adopt and implement the developed energy passport scheme. Project team will organize series of seminars and trainings supporting local professionals and decision makers in energy performance scheme implementation.

Development of guidance manual on code compliance and energy-efficient building design (Output 1.4)

The project team will develop a guidance manual (свод правил) on compliance with the new energy codes. This manual, which is intended for adoption as an official normative document, will provide building designers with explanations of calculation methods for energy performance, as well as design principles. The manual will also contain recommendations on how to attain even greater energy efficiency than required by code, with a target of 15-25% greater efficiency than code requirements.

Component 2: DSM study, energy management, energy efficiency investment plan

Comprehensive housing stock DSM study (Output 2.1)

The project team and local experts will work closely with the International Energy Auditor/DSM Expert to develop a comprehensive Demand-Side Management (DSM) study on technical and cost-effective energy efficiency potential in existing housing stock in Turkmenistan/Ashgabat. The DSM study will be based on an inventory of the housing stock, analysis of locally available energy savings technologies and their costs, and energy audits of selected typical residential buildings representatives. The study will provide information on technical and cost-effective energy saving potential for each of the selected building representative as well as estimates of aggregated savings potential for the whole housing stock nationwide. The calculation of cost-effective energy efficiency potential will be based on costs of energy savings measures, calculated energy savings in technical and financial terms, expected economic lifetime of EE measures, and appropriate discount rate, and will be presented ideally in a form of an energy efficiency supply curve. The project team will present the findings of the developed DSM study to local decision makers and relevant stakeholders and will be used for drafting the energy-efficiency investment plan.

Capacity-building on energy management and audit (Output 2.2)

The project team will develop and implement a system of energy management in multiapartment buildings that are supplied by Turkmengas and possibly other owners of multiple buildings, including buildings with building level gas boilers and decentralized district heating schemes. The energy management system will include actions both at the building level and at the agency level to gather and store data, and to remedy problems revealed by monitoring. At the building level, the energy management system will monitor energy consumed for space heating, air-conditioning, and other end-use appliances, i.e. mainly natural gas and electricity, and/or water consumption as well. In selected buildings, including typical building representatives, pilot buildings and buildings that will not be retrofitted, building level heat meters, natural gas, electricity or water meters will be installed as well if necessary. The actual energy consumption based on metered data will be read and monitored at least monthly for each building, and weather normalized consumption will be calculated based on actual weather data. Energy monitoring data will be used for comparison of consumption of individual buildings according to their construction type, technology used for heating/air-conditioning, and the size of the building (heated/air-conditioned area/apartment area).

The findings of the energy monitoring will be presented to building owners and utility suppliers (Turkmengas and others) and will serve to identify potential candidates with highest specific energy consumption for implementation of energy audits and subsequent energy efficiency improvements as well for monitoring actually achieved savings in pilot buildings.

Based on the energy auditing methodology implemented in Output 2.1, the project team will develop a scheme for sustainable energy audits implementation in cooperation with Turkmengas, housing stock owners and other relevant stakeholders. The energy auditing scheme can be based on a voluntary agreement of building owners, energy suppliers or other relevant institutions to implement energy audits in buildings that will be reconstructed and in those buildings that have excessive energy consumption. Alternatively, the auditing scheme could be based on a mandatory regulation. In such case the project will develop a draft version of such regulation/legislation and will discuss it with relevant stakeholders and work with decision makers to have it approved and adopted.

The project will deliver recommendations and technical methodologies for both energy audit and energy management to the Ministry of Communal Services and other interested agencies, and will provide training to responsible personnel on implementation.

Energy-efficiency investment plan (Output 2.3)

Based on the DSM study the project team in cooperation with Turkmengas, Municipality of Ashgabat and other relevant organizations will prepare draft version of an energy-efficiency investment plan with different scenarios of scale and rate of implementation. This plan will focus on renovation of existing buildings, but may also include support for design of energy-efficient new buildings. The project team will present the investment plan to relevant stakeholders and will work with them to adopt the preferred investment plan scenario.

Component 3: Demonstration of energy-efficient new and renovated buildings

New residential buildings demonstrating energy-efficient design and construction (Output 3.1)

The project team and its partners at Turkmengas and within the government of Turkmenistan have made significant progress already in identifying three new buildings that will serve as pilot projects demonstrating energy-efficient design, technology, and construction. Turkmengas has agreed to designate two elite residential buildings, to be designed and built by Turkmenneftgasstroï, as pilot buildings. In addition, the Ministry of Foreign Affairs of Turkmenistan has provided a Note Verbale confirming that the Turkmen side agrees to designate as a pilot building one 9-story residential building from the very common U148 series, located in the MIR 7/1 microdistrict.

The new elite multiapartment buildings are to be designed individually. If a new building is designed from the very beginning with the goal to optimize energy performance the total construction costs do not need to exceed standard costs of comparable buildings, while the energy performance can be significantly improved. However, when redesigning an already existing building design, as with the U148 pilot, the potential to optimize the building layout and fully implement Integrated Building Design principles is limited, and thus the costs of such energy efficient re-designed buildings tend to be somewhat higher. Higher costs might hamper the replication rate. Thus it will be critical to focus not only on energy savings measures, their technical energy savings, but also on their cost-effectiveness and total costs.

The project team will engage an International Consultant expert on energy-efficient building design to assist with the project team and contracted national building design agencies with design of all three new buildings. With the elite buildings in particular, the project team will seek to maximize benefits of Integrated Building Design and to design a new residential building with optimized energy performance with minimum incremental costs. The international architect will also participate in training for professionals in Turkmenistan on principles and international best practices in cost-effective Integrated Building Design and low-cost/cost-effective energy efficient building design, including specifics of construction details to avoid thermal bridges and condensation. After specification of new pilot buildings, the international expert will propose energy efficiency measures and specific solutions to be implemented in the energy efficient re-design and will guide, assist and work closely with local professionals in developing the technical redesign of the building with the goal to reduce energy consumption by at least 15 percent beyond the requirements of the revised building codes, and at least five percent beyond prevailing best practice in Turkmenistan, while also optimizing investment costs, i.e. minimizing incremental costs.

Demonstration of energy-efficient renovation of existing buildings (Output 3.2)

Based on the results of energy audits conducted in Output 2.1, the project team and responsible representatives of the Ministry of Communal Services, with the participation of the International Consultant on building design, will define specifications and technical measures for energy-efficiency upgrades of existing buildings selected as pilot sites for retrofit. Measures will be installed under strict quality control.

Local experts will develop energy passports for all pilot projects based on developed methodology. The project team will also develop a methodology for monitoring of GHG emission reductions tailored for concrete pilot projects and will monitor energy performance and actual energy and GHG savings in pilot buildings.

Methodologies, results, and lessons learned from all the pilot projects will be compiled in detail and presented to national design institutes, developers, and government officials, with the goal of facilitating the widest possible replication of positive demonstration-project results.

Component 4: Replication and training

Output 4.1 (retrofit protocols for common designs) is to be eliminated. This component is rather unclear, but the project team has interpreted it to call for the development of a formal technical process for retrofit of common existing building types. But this purpose is redundant with Component 2, which already foresees replication of the most cost-effective retrofit measures. The project document also mentions once “EE construction” in addition to retrofit as a focus of Output 4.1, but here too, there is redundancy with other components (3.1 and 3.2, which specifically call for replication of demonstration-project designs)

Training for building designers (Output 4.2)

The project team will deliver training seminars for at least 50 architects and engineers on compliance with new codes, methods for calculating building energy performance, and best practices in energy-efficient building design, including integrated building design (beyond mere compliance with thicker insulation requirements), integration of low-cost no-cost energy efficiency principles into building design, lessons learned and best experience available internationally with a special focus not only on space heating but on summer cooling needs, shading principles, etc.

Training will also be delivered at the university level. The project will prepare a curriculum for university students on energy efficiency practices in housing sector, including energy auditing and energy efficient reconstruction of existing building stock, as well as energy efficiency/Integrated Building Design of new buildings. In addition, a competition for students on design of best energy performing buildings with affordable costs will be organized.

A study tour for Turkmen officials carried out during the fall of 2012 also fits within this output.

Incorporation of recommendations into government policies and programs (Output 4.3)

The project team will regularly share updates and recommendations to key stakeholders within the government of Turkmenistan and other interested agencies. Much outreach will take place within the existing processes of the project Steering Committee and Technical Advisory Board, but the project will also prepare additional non-technical briefing documents (“executive reports”) and at least one round-table meeting for high-level decisionmakers.

The project team will compile results and lessons learned from the whole project and will disseminate them not only to the aforementioned stakeholders within Turkmenistan, but also throughout Central Asia and beyond. Maintenance of updated content on the project’s website will be a part of this effort.

V. Methodology of GHG monitoring

Under the Component 3 the project team will develop a detailed methodology for monitoring of GHG emission reductions tailored for concrete pilot projects.

The methodology of GHG monitoring will combine both energy metered data and calculation of energy consumption. Metered energy consumption provides information on actual energy consumption, however typically energy meters, if installed, do not meter energy consumption for specific end-use individually (combined electricity meter for air-conditioning and other electricity utilization, domestic hot water). Gas meters for boiler houses meter fuel input to boilers, but not final end-use energy - delivery of heat for space heating in rooms, or domestic hot water, end-use delivery of cold for air-conditioning etc). Thus metered data need to be adjusted for energy transformation losses in boiler house and for losses in piping. Metered energy consumption describes not only energy performance of a building, but also actual behavior of its tenants (indoor temperature, usage of air-conditioning, window opening, water usage, ...). The individual behavior pattern of concrete tenants in a single building may easily offset any energy savings measures. Window opening instead of using regulation might easily increase energy consumption tenfold. Statistical data on metered energy consumption (i.e. metered data from significantly large amount of buildings) reduces the risk of individual deviation. However, the statistics usually does not provide information on specific use of energy in each building if they differ.

Calculated energy consumption on the other hand reflects reasonably well designed parameters of the building and estimated energy use patterns, but it does not show any potential construction failures or actual individual energy use patterns.

Calculation of energy consumption should thus combine both methods, metering and calculation, and use assumptions in such a way that the results would be reasonable and realistic enough.

- Project direct GHG emission savings will be calculated based on energy savings of specific energy form (fuel) realized from re/constructed pilot buildings and respective CO₂ emission factor
- Energy savings will be calculated as difference between weather normalized “after project” energy consumption and a weather normalized baseline consumption for space heating and air-conditioning. In case other energy savings measures will be implemented (lighting, lift, domestic appliances and other technologies) these savings will be calculated separately.
- Energy consumption (baseline and “after project”) will be assessed by a combination of two methods: actual metered energy consumption and calculated energy consumption
- Baseline energy consumption of newly constructed buildings will be based on metered energy consumption in new buildings of similar construction type adjusted for its size/volume, potential other energy consuming facilities (other buildings supplied from the same boiler house, swimming pool, ...)
- In case of only more energy efficient redesign of new buildings the metered baseline will be compared with calculated energy consumption of original building design without additional energy savings measures

All reconstructed and newly constructed pilot buildings will be equipped with building level energy meters (electricity, natural gas, heat). Building level heat meters might not be installed in buildings if they have their own boiler house with metered natural gas consumption, and if efficiency of boilers and heat piping losses can be calculated sufficiently precise.

VI. Summary of changes to the Project Document

Based on the conditions and issues described above in Sections II and IV, this Inception Report presents some changes to the Project Document and logical framework. While many of these

changes simply involve clarified wording, others reflect more substantive shifts based on changing conditions and opportunities in Turkmenistan. Some of the project logframe indicators and targets have been redefined to better and more specifically reflect project outputs and revised project activities and to remove duplications.

Overall targets

One key difference to the Project Document is based on the finding that the target direct project GHG emission reductions have been based on probably overestimated energy consumption – and thus also absolute energy savings - in new “elite” residential buildings. The project now estimates that in order to reach such very ambitious direct GHG emission reduction target of 202 866 tCO₂ by the end of the project, the project needs to maximize the impact of the project and the replication of re/construction of energy efficient buildings. The Project Results Framework now contains a footnote that the project will gather more baseline data and reconfirm this quantitative target for direct emissions reduction by the time of Midterm Evaluation.

One critical factor for sufficient replication is the investment costs of re/constructed energy efficient buildings. Since the pilot new residential buildings are expected to be based on already existing building design, it will not be possible to fully implement Integrated Building Design principles and to optimize investment costs - i.e. minimize incremental costs. The project team should thus maximize its effort to develop fully new design of new pilot buildings that would allow demonstrating not only technical/energy savings but also investment cost savings.

Main changes in the project logical framework include:

- Removal of indicators based on amount of investment spent and planned for energy efficiency/ buildings

The rationale for the removal of such indicators is that the ultimate goal of the project is the GHG emission reduction target, and the critical success factor is the lowest possible cost of achieved GHG emission reductions (in USD/tCO₂). The investment indicator (in USD) could easily become counter-productive since it might encourage rather costly energy efficient solutions.

Further but rather formal change in LogFrame target is a change of 48% energy savings target in reconstructed buildings to 44% in Outcome 3/Output 3.2.

This is because the 48% energy savings target was an arithmetical mistake. The target has been corrected and replaced by 44%. (The combined total energy savings target consists of 10% business as usual energy savings and additional 38% energy savings delivered by project. By mistake the total combined energy savings have been calculated as a simple sum of 10% and 38% (10 + 38 = 48), instead of correct $100\% - [(100\% - 10\%) \times (100\% - 38\%)] = 44.2\%$.) See also footnote to Project Results Framework, page 32.

Components and activities

The project proposes the following changes to the Project Results Framework. Please see Section IV on Implementation Strategy for more details and justification.

- Elimination of Output 1.1, with merging of certain of its activities into Component 2.
- Greater emphasis and more concrete targeted outputs with regard to new building codes under Component 1.

- All seminars and training for building designers have been consolidated in Output 4.2.
- All of Component 2 has been made much more concrete, with descriptions of activities in energy management and audit, plus more clarity about our goals for the investment program. This component retains a focus on renovation of existing buildings, but the investment program may also include support for energy-efficient design and construction of new buildings.
- Output 3.3 (model energy passports) has been consolidated with Output 1.3. Plans for thorough documentation of energy performance of demonstration projects remain unchanged.
- Output 4.1 (retrofit protocols for common designs) has been eliminated because of redundancy with Component 2, which already foresees replication of the most cost-effective retrofit measures., as well as Outputs 3.1 and 3.2, which specifically call for replication of demonstration-project designs. The removal of Output 4.1 also eliminates some confusion associated with the term “protocol,” which has been unclear to the project team in both Russian and English. Targets associated with the original Output 4.1 for replication of retrofit measures have been transferred to Output 2.3 in the Project Results Framework.

VII. Revised project activities

This section presents updated proposed project activities, which have been developed in consistency with the conditions, issues, and changes enumerated in the previous sections. Please see the Annual Work Plan for 2013 for more detail on immediate next steps.

Project Objective:

The proposed UNDP-GEF project will reduce greenhouse gas emissions by improving energy management and reducing energy consumption in the residential building sector in Turkmenistan.

Activity 0.1: The project team will renegotiate and agree with key project partners such as Turkmen gas, the municipality of Ashgabat, the Ministry of Communal Affairs, the Ministry of Construction, and others about the goals and outputs of the project, modes of cooperation and especially the commitment of the partners to support new building codes, to provide necessary approval and co-financing for construction of new energy-efficient pilot buildings and reconstruction of existing ones, and to implement building-level energy metering in pilot buildings if such metering is not available.

Activity 0.2: Establishment of a local Technical Advisory Committee to review planned activities in all project segments. Technical experts from a range of relevant national agencies involved with building design, construction, heating and cooling, energy policy, municipal and utility services, and energy efficiency will be invited to participate in the Advisory Board. Advisory Board will meet at least twice a year or more often as required and will provide expert advice and recommendations to project management. Responsibility for project management and quality of work lies with the project team. Teachers from universities and practicing professionals are welcome to participate too, both to provide advice and to gain hands-on experience from the project to apply in their daily work teaching students/designing energy efficient buildings. More detailed reviews of project designs etc. that will require additional time of experts may be remunerated.

Component 1: Energy Efficient Building Codes and Supporting Capacity Strengthening

Outcome 1: Energy consumption in new buildings is reduced beyond current requirements.

Output 1.1 has been merged with the outputs of Component 2.

Output 1.2¹: More stringent requirements for energy performance in buildings are adopted and supporting capacity for building code enforcement is strengthened

Activity 1.2.1: Review of international building thermal insulation and energy efficiency performance codes, energy passport and building labeling schemes, best practices and trends in the CIS and the EU/other developed countries, with special focus on energy consumption and peak demand for space heating and air conditioning, including thermal insulation of buildings, required controlled and natural indoor air exchange, solar gains/shading, energy performance and energy efficiency calculation and classification methodologies (simplified and complex methods), difference between the R-value of the complete building element and insulation R-value of individual components. Review of national building energy codes and identification of needed updates. Compilation of a summary report and recommendations on new and revised building energy codes to be developed in Turkmenistan, including methodology of energy performance calculation.

Activity 1.2.2: Development of a new building code on thermal performance of buildings that includes whole-building energy efficiency performance requirements, including associated calculation methodology. Revision of energy-efficiency content of existing national building codes on roofs and roofing, residential buildings, and building climatology. New building code requirements to be comparable with advanced international building codes, in terms of both energy demand for space heating and for air conditioning/cooling.

Activity 1.2.3: Organization and provision of training for Glavgosekspertiz staff on the new and revised building energy codes, methods of energy performance calculation, and best practice in code compliance and enforcement. Training to be provided at least annually after the adoption of new and revised codes.

Activity 1.2.4: Expert support to the Ministry of Construction in adoption of the new building energy efficiency regulation.

Activity 1.2.5: Support of development and adoption by the Ministry of Construction of a schedule for periodic review and updating of building codes, for progressively more stringent requirements for the energy performance of buildings.

Output 1.3: Energy passport system² and other policy tools to promote and enforce more energy efficient construction

Activity 1.3.1: In conjunction with activities implemented within Output 1.2, development of provisions/regulations on energy passports and ratings for new and renovated buildings, including definition of duties of responsible parties as well as technical methodologies for calculating and rating energy performance.

Activity 1.3.2. Review of international best practice with regard to physical labeling of buildings in terms of energy performance, and development of written recommendations on applicability of a labeling system to newly designed, renovated, and/or existing buildings in Turkmenistan.

Activity 1.3.3: Expert support to the Ministry of Construction and other relevant decisionmakers in adoption of the provisions specified in 1.3.1 and 1.3.2.

Output 1.4: Development of new official normative document providing guidance on EE building design and compliance with new and revised codes, as building design beyond code requirements.

¹ Outputs and activities retain their original numbering, for clarity's sake, even after the removal of Output 1.1.

² Analogous to "Energy Performance Certificate" mandated by EU Energy Performance in Buildings Directive

Activity 1.4.1: Development and support for adoption and publication of an official design manual (code of practice, or свод правил) for architects and construction engineers on meeting new energy-efficiency requirements of building codes, as well as guidance on how to exceed required energy performance levels (with a target of 15-25% greater efficiency than code requirements).

Component 2: Demand-side management partnership with Turkmengas

Outcome 2: Turkmengas and other national agencies understand the potential for savings in its housing stock and have the capacity to identify and undertake investments in energy efficiency there.

Output 2.1: Analysis conducted on the most cost-effective means of reducing energy consumption in the residential sector.

Activity 2.1.1: Comprehensive assessments of energy efficiency potential in existing residential buildings will be prepared. Typical representatives of the whole building stock will be selected; energy efficiency potential both for space heating and air conditioning/cooling in each of the typical buildings will be assessed based on energy audit analysis. Life-cycle cost of saved energy efficiency measures will be calculated and energy efficiency supply curve constructed for all selected buildings. Cost-effective and achievable energy efficiency potential in all buildings stock will be identified. Energy audits will be conducted for 5 buildings in 2013 (including the buildings selected as pilots for reconstruction), and for 10 buildings each in 2014 and 2015.

Activity 2.1.2: Existing buildings selected as pilots for reconstruction (as well as similar buildings selected as baselines against which the pilot projects will be compared) will be equipped with building-level energy metering devices (natural gas, district heat, electricity, other), and with data loggers to monitor other technical parameters and energy consumption (indoor temperature, usage and electricity consumption of air conditioners, etc). Financing of energy meters and their installation by local partners will be negotiated.

Activity 2.1.3: After the initial energy audits, energy consumption in selected typical buildings will be regularly monitored and evaluated over the whole duration of project implementation, including load profiles of energy consumption and indoor and outdoor temperatures and other weather data (sunlight, etc); a summary report will be prepared annually.

Output 2.2 Responsible staff is trained in energy management and the identification of energy savings in the housing stock

Activity 2.2.1: Written recommendations on a system of energy management and monitoring in existing residential buildings will be established. This system will include inspection schedules, protocols and schedules for collection of data on energy consumption, and periodic assessment of potential for improved energy efficiency, with definition of duties of responsible parties at both the building level and the agency level.

Activity 2.2.2: The energy audit methodology developed in Activity 2.1.1 will be refined, written, and disseminated to the Ministry of Communal Affairs, building managers, and other interested parties, and also made available on the project's web page.

Activity 2.2.3: At least one training seminar on energy management and energy audit will be provided to the staff of the Ministry of Communal Affairs, as well as building managers and other interested parties. The International Consultant expert on energy audit will participate in this training. In addition to this training in the classroom, the project will seek to engage interested parties selectively in hands-on participation in the energy audits conducted under Activity 2.1.1.

Activity 2.2.4: Energy audit training materials, as well as results and lessons learned from the energy audits of Activity 2.1.1, will be summarized, published in a written report, and also made publicly available at the project website.

Output 2.3 Investment plan for reducing energy losses for the housing stock that Turkmen gas supplies with natural gas in Ashgabat

Activity 2.3.1: Based on the results of Activity 2.1.1 for existing buildings, as well as the findings of Activities 1.2.1 and 1.4.1 for new buildings, a comprehensive study will be prepared evaluating the cost and value of conserved energy in buildings. These estimates of cost and value of conserved energy will be compared with the cost and value of natural gas exports. On this basis, the study will also present scenarios of cost-effective short-term and mid-term energy-efficiency investments by Turkmen gas and/or relevant government agencies.

Activity 2.3.2: Presentation of the investment plan to Turkmen gas and other governmental agencies and decision makers, recommendations for the support of selected investment scenarios, and support for necessary assessment, approval, and creation of necessary administrative processes for implementation.

Component 3: Improved design measures for major residential consumers

Outcome 3: Energy-efficient design and technologies are incorporated and visually demonstrated in new and reconstructed residential buildings.

Output 3.1 Three new multi-unit residential buildings with significantly improved energy performance are designed and constructed.

Activity 3.1.1.: Site identification (jointly carried out by the Project Team and the developers) and execution of formal Memoranda of Understanding about collaboration on the pilot projects.

Activity 3.1.2.: Energy baseline consumption calculated for selected type of building based on metered and calculated energy consumption of similar buildings under similar conditions.

Activity 3.1.3: Drafting technical specifications for the building performance design and engineering in selected demonstration buildings (jointly carried out by the Project Team, International Consultant on building design, the Technical Advisory Committee and the developers).

Activity 3.1.4: Development of project designs (carried out by the contracted designers with support of International Consultant on building design and feedback from Project Team and developers), including cost estimation, and formalization by contract of shared responsibilities for payment for materials and construction

Activity 3.1.5: Acquisition of construction permits and procurement of construction materials and EE technologies (with procurement jointly carried out by the Project Team and the developers).

Activity 3.1.6: Construction and construction oversight (additional construction oversight with a special focus on quality of energy efficiency construction details will be supported in addition to a standard construction oversight by the Project Team). Such oversight will have the goal not only of assuring quality construction in accordance with the design, but also of building the capacity of the construction company.

Activity 3.1.7: Monitoring and evaluation of building performance, including analysis based on metered consumption of all energy carriers, indoor and outdoor temperature, sunshine and other factors will be prepared. Use of Energy Passport, as developed under Output 1.3, plus expanded documentation as necessary, to record relevant building features and energy performance.

Activity 3.1.8: Development of a GHG monitoring methodology that will estimate post-project GHG savings in pilot buildings, expected and achieved energy savings. Decision on which local partner

(university, governmental agency) will implement energy and GHG monitoring after project termination, securing financing from local sources.

Activity 3.1.9: Ongoing documentation of the design and construction approach, including key energy efficiency details and lessons learned, and dissemination of this information to the greatest extent possible to potential beneficiaries: building designers, architects, construction and heating engineers, policy makers, and developers. Information dissemination via project web site, by targeted workshops, presentations and media, in conjunction with Outputs 4.2 and 4.3.

Output 3.2 Three multiunit residential buildings are reconstructed with significantly improved energy performance.

Activity 3.2.1: Building selection (jointly carried out by the Project Team and the building developers) and execution of formal Memoranda of Understanding about collaboration on the pilot projects.

Activity 3.2.2: Specification of methodology of baseline energy consumption in existing buildings and calculation of baseline energy consumption and energy performance of buildings selected for retrofits based on energy audits– jointly with Outcome 2 activities.

Activity 3.2.3: Based on performed energy audits, drafting of technical specifications for the design of the building EE retrofit in the selected demonstration buildings.

Activity 3.2.4: Development of designs (jointly carried out by the Project Team, International Consultants on energy audit and/or building design, and the developers), including cost estimation, and formalization by contract of shared responsibilities for payment for materials and construction

Activity 3.2.5: Reconstruction and specific energy efficiency oversight. The project reconstruction oversight will pay a special attention to the quality of energy efficiency construction details, such as elimination of thermal bridges, air and humidity tightness of insulated structures etc. Quality control efforts will serve the purpose not only of ensuring correct installation of measures, but also of building capacity of the contractor

Activity 3.2.7: Prepare and implement post-retrofit monitoring and evaluation of building performance, including assessments of effects of occupant behavior (setting of temperatures, consumption of hot water, etc.). Monitoring will be analogous to Activity 3.1.7 and 3.1.8. Use of Energy Passport, as developed under Output 1.3, plus expanded documentation as necessary, to record relevant building features and energy performance.

Activity 3.2.8: Ongoing documentation of the design and renovation approach, including detailed plans

and lessons learned, and dissemination of this information to the greatest extent possible to potential beneficiaries similarly as in Activity 3.1.9, in conjunction with Outputs 4.2 and 4.3..

Component 4: Replication through training and support for policies that encourage energy efficiency

Output 4.2 Design institutes and major housing developers are trained in and encouraged to incorporate advanced energy efficiency in residential building design.

Activity 4.2.1: Provision of training seminars for at least 50 architects and engineers on compliance with new codes, methods for calculating building energy performance, and best practices in energy-efficient building design, including integrated building design (beyond mere compliance with thicker insulation requirements), integration of low-cost no-cost energy efficiency principles into building design, lessons learned and best experience available internationally with a special focus not only on space heating but on summer cooling needs, shading principles, etc. .

Activity 4.2.2: Development and implementation of curricula for students of architecture and construction engineering, including development of training materials, and packaging of training for the use in post-secondary academic curricula. The curricula will include an overview of design

approaches and solutions related to energy efficient building design of re/constructed buildings, including energy reduction for space heating, cooling, and lighting.

Activity 4.2.3: Organization of a national competition for architecture and engineering students and professionals submitting designs for highly-efficient buildings with affordable costs meeting a requirement of energy performance with at least 25% higher efficiency than in current codes.

Appointment of an advisory committee to judge submissions. Arrangement of an awards ceremony and an exhibit, with accompanying brochure that will ensure high visibility for the best designs.

Activity 4.2.4: Organization of a study tour for Turkmen experts on best practices in housing energy efficiency policies, design of energy efficient buildings, and certification system of energy performance of buildings/energy passports will be organized, with a focus on energy efficiency experience in the housing sector in developed countries.

Output 4.3: Recommendations from the project are incorporated into government energy efficiency policies and programs.

Activity 4.3.1: Ongoing communication and regular distribution of project findings between project personnel with all project partners and key stakeholders, such as the Ministry of Construction, governmental institutions responsible for developing and implementing policies related to energy efficiency.

Activity 4.3.2: Preparation of executive reports on key policy issues addressed under the project (e.g. demand-side management programs, mainstreaming energy efficiency issues into housing policy, integrated building design of low-cost low-energy buildings, etc.).

Activity 4.3.3: Organization of a high-level round-table meeting for policy/decisionmakers to review the executive reports.

Activity 4.3.4: Publication of project findings and lessons learned to serve as “good practice” guidance for subsequent EE policies and programs in Turkmenistan.

Activity 4.3.5: Distribution of executive reports, and project lessons learned to the administration in other regions of the country and to other state entities that develop and manage a substantial amount of housing stock.

Activity 4.3.6: Maintain project website with up-to-date information on project results, information developed and experienced learned. Key results and materials to be published in Russian as well as in English for international audience. Transfer the maintenance/operation of the project website before project termination to a local partner who will keep project web site operational and continue these information dissemination activities after project termination for at least 5 next years.

The table below shows the timetable for revised project activities.

Activity	2012		2013				2014				2015			
	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4
0.1	X													
0.2	X													
1.2.1.		X	X											
1.2.2			X	X	X	X								
1.2.3						X	X							
1.2.4								X	X					
1.2.5								X	X					
1.3.1					X	X								
1.3.2						X	X	X						
1.3.3								X	X					
1.4.1					X	X								
2.1.1			X	X	X	X								
2.1.2		X												
2.1.3		X	X	X	X	X	X	X	X	X	X	X	X	X
2.2.1				X	X	X	X							
2.2.2					X	X								
2.2.3						X								
2.2.4						X								
2.3.1							X	X						
2.3.2									X					
3.1.1	X													
3.1.2	X	X												
3.1.3		X	X	X										
3.1.4		X	X	X	X	X								
3.1.5					X	X	X	X	X	X	X	X		
3.1.6							X	X	X	X	X	X		
3.1.7											X	X	X	X
3.1.8									X	X				
3.1.9											X	X	X	X
3.2.1	X													
3.2.2	X	X	X											
3.2.3		X	X											
3.2.4			X	X	X									
3.2.5					X	X	X	X	X	X				
3.2.6						X	X	X	X	X				
3.2.7									X	X	X	X	X	X
3.2.8											X	X	X	X
4.2.1			X				X				X		X	
4.2.2						X	X	X	X					
4.2.3									X	X	X			
4.2.4	X													

4.3.1			X	X			X	X		X	X	X	X	X
4.3.2					X				X				X	
4.3.3						X				X			X	
4.3.4											X	X	X	
4.3.5										X		X	X	X
4.3.6	X	X	X	X	X	X	X	X	X	X	X	X	X	X

VIII. Revised Project Results Framework

	Indicator	Baseline	Target	Source of verification
Project Goal: Reduce greenhouse gas emissions by improving energy management and reducing energy consumption in the residential sector in Turkmenistan	Reduction of direct GHG emissions from residential sector of Turkmenistan as a result of the project over 20 years, tCO2e	0	202,866 tCO2e by the end of the project ¹	Energy savings (heating and cooling) from the re/constructed buildings and calculation based on transparent methodology
	Natural gas saved annually as a direct result of the project	0	5 133 thousand m3	Energy savings (heating and cooling) from the re/constructed buildings
	Co-financing leveraged for investments in energy efficient reconstruction of existing buildings and construction of new energy efficient housing stock (i.e. beyond existing building code requirements)	0	USD 40,000,000	Contracts with suppliers, information from investors/developers
Outcome 1: Energy consumption in new buildings is reduced beyond current requirements	Existence and content of applicable building codes on building energy performance	No code on whole-building energy performance. Existing codes regulate thermal resistance of building elements, but not whole-building consumption per square meter. Resultant whole-building energy consumption levels under code compliance therefore vary from building to building.	New building energy efficiency code on whole-building thermal performance and revisions of existing building codes on roofs and roofing, residential buildings, and building climatology developed and implemented. New code requires heat energy consumption at or beyond Level 2 for all buildings (5 to 10	Publication of official building codes. Official data on code compliance, with verification via interviews with officials and building designers, as well as possible selective field verification of buildings

		Existing thermal engineering code adopted in 1998 contains two levels of prescriptive thermal envelope requirements, Level 1 and Level 2. Buildings consume 35-70 percent less energy under Level 2 than under Level 1, but Level 2 is implemented in practice only for elite residential buildings, not common building designs for standard housing.	percent less than Level 2 for elite residential buildings), with Level 1 compliance no longer applicable. Introduction of energy passport system in conjunction with adopted new and revised building codes.	
Outcome 2: Turkmen gas and other national agencies understand the potential for savings in its housing stock and have the capacity to identify and undertake investments in energy efficiency there.	Number of energy audits Number of professionals trained Existence and volume of activity of program, run and funded by Turkmen gas and/or other state agencies, on energy efficiency investment in buildings	No audits, training, or investment program	25 energy audits carried out by project (5 planned for 2013, 10 each for 2014 and 2015). At least 30 professionals including Turkmen gas staff trained Short- and long-term investment plan for Turkmen gas and Ashgabat housing stock developed , with EE design and/or retrofit carried out in at least 25 buildings by the end of the project	Review of project deliverables and documentation Interviews with Turkmen gas personnel
Outcome 3: Energy efficient design and technologies are incorporated and visually demonstrated in new and reconstructed residential	Number of pilot buildings designed and built Energy consumption of pilot buildings relative to similar new and existing buildings in Turkmenistan	No demonstration buildings yet built or renovated Baseline energy consumption to be determined by calculation based on assumed standard features, as well as code	New pilot buildings designed and constructed with calculated energy consumption 15 percent less than required by code, and five percent less than prevailing best practice for elite buildings	Review of the project deliverables – building designs, interviews with designers, and results of monitoring

buildings		requirements and statistical data on analogous existing buildings if available.	Three designs for reconstruction developed and implemented with at least 44% ⁽¹⁾ energy consumption reduction	
Outcome 4: Replication facilitated via development of skills, prototype designs and policies for energy efficient buildings	<p>Number of architects, engineers, and students trained with regard to EE building design and code compliance</p> <p>Existence and content of executive reports and briefings of decisionmakers on project findings, lessons learned and recommendations</p>	<p>No training on EE building design and code compliance</p> <p>No formal delivery of information or advocacy to decisionmakers on EE buildings</p>	<p>Training on EE building re/construction, experience from implementing integrated building design delivered to at least 50 architects and/or engineers</p> <p>Course materials on energy efficient building design and re/construction developed and delivered to at least 30 students by the end of Q4/2014</p> <p>Executive reports and at least one high-level meeting on project findings, lessons learned and recommendations for policy makers developed and delivered to key governmental and regional policy makers by the end of the Q3/2015</p>	Review of project deliverables, participant rosters, interviews or surveys of participants

1. Direct emissions reduction target to be reconfirmed before Midterm Evaluation based on baseline data from pilot projects.

Explanation:

The combined total energy savings target consists of 10% business as usual energy savings and additional 38% energy savings delivered by project. By mistake the total combined energy savings have been calculated as a simple sum of 10% and 38% (10 + 38 = 48), instead of correct $44.2\% = 100\% - [(100\% - 10\%) \times (100\% - 38\%)]$.

Business as usual energy savings: 10%

These 10% energy savings of the baseline consumption have been estimated to be achieved even without the project (based on basic facade and roof reconstruction and some window replacement).

Additional energy savings (as a result of project activities): 38%

These 38% indicate additional relative energy savings compared to the baseline consumption *after* the business as usual energy savings are implemented, i.e. compared to 90% (100%-10%) of the baseline consumption).

Energy consumption (EC) after implementation of business as usual energy savings (10% energy savings) is:

$$EC = (100\% - 10\%) \times BEC = 0.9 \text{ BEC}$$

where

BEC = Baseline Energy Consumption

Target Energy Consumption (TEC) after UNDP project activities will be implemented and energy efficiency measures incorporated in existing pilot buildings with expected 38% additional energy savings is:

$$TEC = (100\% - 38\%) \times EC = (100\% - 38\%) \times (100\% - 10\%) \times BEC = 0.62 \times 0.9 \times BEC = 0.558 \text{ BEC} = (100\% - 44.2\%) \times BEC$$

Total energy savings compared to baseline energy consumption are thus 44.2%.

IX. Project risks and mitigation strategy

Project Risks	Rating	Rational for the rating	Risk Mitigation Strategy
Lack of governmental commitment to revise and introduce more stringent building codes and other regulations supporting energy efficiency	L - M	The government has demonstrated strong interest in housing reforms and in climate change mitigation; it understands that building codes represent a straightforward and effective means of reducing end-use consumption in the housing sector. However, there is no binding formal commitment of the government to adopt new regulations supporting energy efficiency.	Approach top level policy and decision makers and inform them about project achievements and benefits of strengthened building codes and new energy efficiency regulations See Activities 4.3.1 through 4.3.6.
Low incentives among housing developers to introduce more efficient designs and energy-saving measures	L	All developers have to comply with building codes, which will continue to become more rigorous over time, and because the financial incentive developed under the project will reward developers who produce significantly more efficient buildings.	Review the system of building codes enforcement and propose an effective system of compliance control (published energy passports of newly re/constructed buildings, control system of energy passport correctness). See Activities 1.3.1 and 1.3.3.
Lack of funding to support investments in the housing sector and to finance pilot projects	L	Although there are no long-term binding investment plans for construction of new housing estates and reconstruction of existing buildings, the government annually approves investments for building re/construction. It is expected that this practice will continue in the future as well, since housing development and improvement is a country priority. A general agreement on financing of pilot projects is in place.	Formalize the agreement on financing pilot buildings re/construction by means of Letters of Intent or Memoranda of Understanding or similar, and a final legally binding contract for cost-sharing. See Activities 3.1.1, 3.1.4, 3.2.1, and 3.2.4.
Lack of funding for replication of pilot projects	M	The willingness to finance replication of re/construction of energy efficient housing will critically depend on the level and affordability of incremental costs. The lower the incremental costs will be the higher will be the probability and scale of replication.	During design of re/constructed buildings focus not only on energy performance and energy and GHG savings targets, but balance energy savings with incremental costs – and keep incremental costs at minimum if possible. See Activities 3.1.3, 3.1.4, 3.2.3, and 3.2.4.
Incremental costs of pilot projects, especially in case of newly constructed buildings will be unnecessarily high (and correspondingly costs of	M	Newly constructed pilot buildings are currently planned to be based on already existing and approved typical building design which reduces the potential to fully implement Integrated Building Design.	Work and agree with building developers/investors to develop a completely new design of a pilot building with a target to minimize incremental costs and achieve

<p>GHG emission reductions in USD/ton of CO₂ as well)</p>			<p>the target of 25% energy savings. Select an experienced international energy efficiency building architect/expert based on demonstrated experience not only in design and construction of energy efficient housing, but in the same time of housing with minimal incremental costs. See Activity 3.1.3 and 3.2.3.</p>
<p>Replication factor of pilot buildings and sustainability of project results will be limited</p>	<p>L - M</p>	<p>In addition to financing of incremental costs the replication and sustainability of project results will heavily depends on capacity of local architects and designers to fully implement IBD – i.e. their capacity to design energy efficient buildings with minimal incremental costs.</p>	<p>Focus the training of local architects, designers and engineers in EE building code compliance and IBD not only on solutions based on “additional insulation” but on full implementation of principles of IBD in early phases of building design concept already (including strategies to optimize and decrease costs of standard building designs). See Activity 4.2.1.</p>

X. Project team and project management structure

Project team will consist of the following local project staff:

Low Emission Development Program Component Manager– responsible for strategic project management in a timely and effective manner, and for implementation of effective adaptive management if needed.

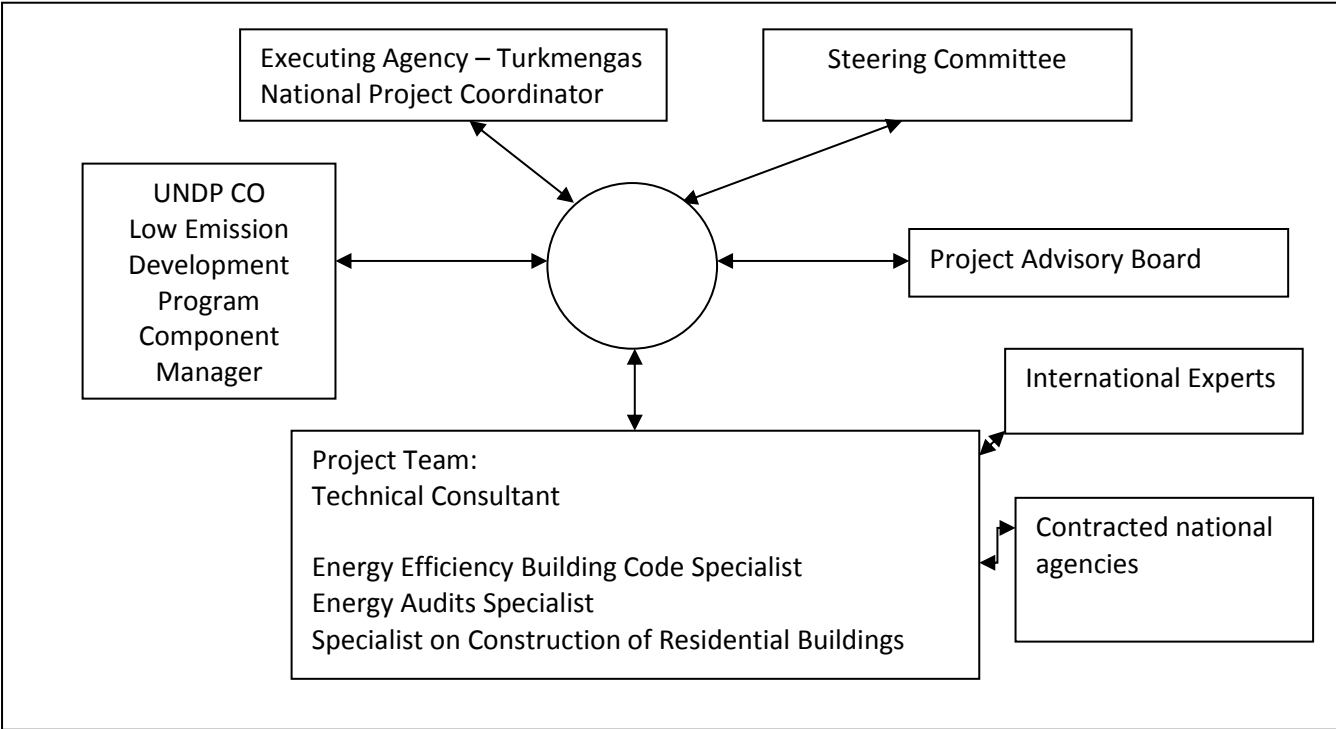
Technical Advisor – responsible for daily project management of the Project Team and delivery in good quality, in time and within a budget of all project components

Energy Efficiency Building Code Specialist – responsible for delivery of Outcome 1, support to Outcome 2, 3 and 4.

Energy Audits Specialist – responsible for delivery of Outcome 2, support to Outcome 1, 3 and 4

Specialist on Construction of Residential Building– responsible for delivery of Outcome 3, support to Outcome 1, 2 and 4

Chart 1: Project Management Structure



International consultants

The team of project international experts will include:

International Technical Advisor

ITA will assist the project team and will provide advice and guidance on implementation of all project components. The International Technical Advisor will serve the project ideally over the whole project period, however on an ad hoc short term basis. Specific services of the ITA will be provided upon request from the project team.

International Consultant – Building Energy Codes and Rating Systems

The International Consultant on Building Energy Codes and Rating Systems (briefly, the IC for Building Codes) will have demonstrated experience in best international practices in energy-efficiency codes for buildings, including energy performance standards and performance calculation methods and energy passport systems both in CIS region and in EU/other developed countries. The IC for Building Codes will be responsible to lead and guide a review of an existing building code and to upgrade it to comply with more demanding international standards, to include into building codes energy performance components, and to deliver trainings on building codes.

International Consultant – Building Design

The International Consultant on Building Design will have demonstrated experience in design and construction of energy efficient residential buildings with minimal incremental costs (Integrated Building Design) and will be responsible primarily in delivering trainings of local experts in IBD and in assisting in the design of new and renovated pilot buildings reflecting targeted levels of energy efficiency, but also with minimal incremental costs.

International Consultant – Economic Analysis and DSM Planning

The International Consultant on Economic Analysis and DSM Planning (IC for Economic Analysis) will have expertise in quantitative economic analysis of energy efficiency programs at the regional and/or national level. Based on the results of energy audits and other initial research, the IC for Economic Analysis will analyze expected energy performance, societal benefits including demand-side management benefits for Turkmen gas, and cost-effectiveness. The IC for Economic Analysis will then develop proposed plans, including quantitative estimates of costs and benefits, for a scaled-up national program of energy-efficiency investment in the building sector.

All international consultants will be hired via a standard open tender process according to UNDP rules.

Contracted national agencies

In addition, the project will engage the services of authorized and duly licensed national agencies in Turkmenistan.

- **Building codes.** The project will engage three different national building-design institutes for the development and revisions of four building codes: the Turkmen Communal Design Institute (Turkmenkommuntaslama) for the new code *Thermal Performance of Buildings*; the Turkmen State Building Design Institute (Turkmenovlettaslama) for the codes *Residential Buildings* and *Roofs and Roofing*; and the Ashgabat Building Design Institute (Ashgabatatlama) for the code *Building Climatology*. These institutes will also be responsible for development of accompanying guidance documents with methodological instruction on how to use these new codes.

- **Building design.** The project will engage the services of one national design institute for design of the new nine-story residential building and one institute for the design of retrofits for three existing pilot buildings subject to retrofit.
- **Construction and renovation.** The project will engage the services of one national construction firm (general contractor) for construction of the new nine-story residential building and one construction firm for the implementation of retrofits for three existing pilot buildings subject to retrofit.

The above activities are expected to involve a total of seven contracts with national agencies (three on building codes, two on building design, and two on construction/renovation). All of these contracts are expected to take place under a waiver of the usual open tender process, given that agency responsibilities and selection processes are already strictly defined by the project's partners, including the Ministry of Construction and the Ministry of Communal Services.

Annexes

1. Annual Work Plan 2013
2. Annual Work Plan 2012
3. Terms of Reference of Project Team Specialists
4. Terms of Reference for International Consultants
5. List of participants at Inception Workshop
6. Minutes of meetings of the Steering Committee and Technical Advisory Board
7. Justification of purchase of project vehicle

Annex 1. Annual Work Plan 2013

Note: Activities under Outputs 1.1, 3.3, and 4.1 are subject to removal upon approval of proposed changes to the Project Results Framework, as discussed in detail in the main sections of this Inception Report.

EXPECTED OUTPUTS <i>And baseline, indicators including annual targets Please use the numbering of outputs as they are in the RRF/SRF of ProDoc</i>	PLANNED ACTIVITIES <i>List activity results and associated actions Please use the numbering of outputs as they are in the RRF/SRF of ProDoc</i>	TIMEFRAME				RESPONSIBLE PARTY	PLANNED BUDGET		
		Q1	Q2	Q3	Q4		Fund- ing Source	Budget Description (including description and budget code)	Amount
Outcome 1: Energy consumption in new buildings is reduced beyond current requirements.							GEF 6200 0	71200-International consultant	31,000
								71400-Individual contracts	15,000
								72400-Communications	1,000
								74200-Printing& publications	3,000
								74500-Misc.	1,500
								75700-Trainings &workshops	5,000
								Total for GEF	56,500
Output 1.1 Incentive Program for increasing energy efficient buildings developed and adopted by housing developers Indicator 1: Incentive program developed and operational by the end of 2013	- Recommendations prepared for revision of the output and summarized in the Inception report; - Project board approved the Inception report and proposed revisions; - AWP and log frame are adjusted accordingly.					I. Atamuradova (LED CM), V. Shmidt (technical consultant), M. Bayramov (expert on building codes, M. Akhmedov (expert on construction), A. Zomov (expert on energy audit), M. Chao (International Chief Technical Advisor)			

<p>Output 1.2 More stringent requirements for energy performance in buildings are adopted and supporting capacity for building code enforcement is strengthened</p> <p><i>Indicator 1: New building energy efficiency code on thermal performance of buildings and revisions of existing building codes on roofs and roofing, residential buildings, and on building climatology</i></p> <p><i>[Code on building climatology to be developed in 2013, but submitted for adoption in 2014 and implemented thereafter]</i></p>	<p>1.2.2: Development of a new building code on thermal performance of buildings that includes whole-building energy efficiency performance requirements, including associated calculation methodology.</p>					International consultant on building codes and rating systems Ministry of Construction of Turkmenistan, Ministry of Communal Services of Turkmenistan			
	- Memorandum of understanding on the revision of building codes and guidance manual on the building codes signed by UNDP and the Ministry of Construction.					M. Bayramov (expert on building codes), Shmidt (technical consultant), Ministry of construction of Turkmenistan, I. Atamuradova (LED CM), UNDP country office			
	- Contracts finalized with the nationally-licensed design institutes responsible for the revision of selected building codes and development of guidance manual (see also Output 1.4). (Without tenders)					M. Bayramov (expert on building codes), Shmidt (technical consultant), Ministry of construction of Turkmenistan, I. Atamuradova (LED CM), UNDP country office			
	- First drafts prepared of new building codes for Turkmenistan:								
	<i>Thermal Performance of Building;</i> (Waiver, contract signed with Turkmenkommuntaslama by May)					M. Bayramov (expert on building codes)			
	<ul style="list-style-type: none"> <i>Residential Buildings and Roofs and Roofing;</i> (Waiver, contract signed with Turkmendovletaslama by April) 					M. Bayramov (expert on building codes)			
	<i>Building Climatology.</i> (Waiver, contract with Ashgabattaslama signed by July)					M. Bayramov (expert on building codes)			

- Meeting carried out for discussion of the first draft of the new building code <i>Thermal Performance of Buildings</i> at the institute "Turkmenkommuntaslama" (Turkmen Communal Design Institute).					M. Bayramov (expert on building codes)			
- Meeting carried out for discussion of the first draft of the revised building code <i>Building Climatology</i> at the institute "Ashgabattaslama" and at Turkmengidromet (the hydrometeorological service of Turkmenistan).					M. Bayramov (expert on building codes)			
- Meeting carried out for discussion of the first draft of the revised building codes <i>Residential Buildings and Roofs and Roofing</i> at the institute "Turkmendovlettaslama".					M. Bayramov (expert on building codes)			
- Drafts of new and revised building codes refined, taking account of notes of the design institutes:								
<i>Thermal Performance of Buildings</i>					M. Bayramov (expert on building codes)			
<i>Residential Buildings and Roofs and Roofing</i>					M. Bayramov (expert on building codes)			
- Terms of Reference developed and solicitation released for International Consultant on building codes and rating systems					I. Atamuradova (LED CM), M. Chao (International Chief Technical Advisor)			
- International Consultant on building codes and rating systems hired. (Tender, contract signed by April)					I. Atamuradova (LED CM), PIU, UNDP country office			

- Draft of the new and revised building codes, refined in light of comments, sent to an international expert for review:								
<i>Thermal Performance of Buildings</i>					M. Bayramov (expert on building codes) and International Consultant on building codes and rating systems			
<i>Residential Buildings and Roofs and Roofing</i>					M. Bayramov (expert on building codes) and International Consultant on building codes and rating systems			
- Draft of the new and revised building codes refined further in light of comments of the international expert:								
<i>Thermal Performance of Buildings</i>					M. Bayramov (expert on building codes) and International Consultant on building codes and rating systems, M. Chao (International Chief Technical Advisor)			
<i>Residential Buildings and Roofs and Roofing</i>					M. Bayramov (expert on building codes) and International Consultant on building codes and rating systems, M. Chao (International Chief Technical Advisor)			
- Draft of the new and revised building codes sent to all interested ministries and agencies:								

	<i>Thermal Performance of Buildings</i>				M. Bayramov (expert on building codes)			
	<i>Residential Buildings and Roofs and Roofing</i>				M. Bayramov (expert on building codes)			
	- Final edition of the draft new and revised building codes of Turkmenistan sent to the Ministry of Construction for confirmation and adoption:							
	<i>Thermal Performance of Buildings</i>				V. Shmidt (technical consultant), M. Bayramov (expert on building codes)			
	<i>Residential Buildings and Roofs and Roofing</i>				V. Shmidt (technical consultant), M. Bayramov (expert on building codes)			
	- Workshop/round-table on new/revised building codes will be integrated with 4.2.				V. Shmidt (technical consultant), M. Bayramov (expert on building codes), I. Atamuradova (LED CM), PIU			
Output 1.3 Energy passport system and other policy tools to promote and enforce more energy efficient construction Indicator 1: Introduction of energy passport system in conjunction with adopted new and revised building codes	1.3.1: In conjunction with activities implemented within Output 1.2, development of provisions/regulations on energy passports and ratings for new and renovated buildings, including definition of duties of responsible parties as well as technical methodologies for calculating and rating energy performance.				A. Zomov (expert on energy audit), M. Bayramov (expert on building codes)			
	- Internet search carried out for existing energy passport systems (documentation and rating systems for energy performance of buildings) throughout the world. Existing energy passport systems analyzed.				A. Zomov (expert on energy audit), with assistance from International Consultant on building codes and rating systems			

- Technical methodology developed for rating residential buildings of Turkmenistan in terms of energy performance, taking account of world best practices and local conditions.				A. Zomov (expert on energy audit), with assistance from International Consultant on building codes and rating systems			
- Model of the energy passport and rating system developed, taking account of local conditions as well as the drafts of new and revised building codes, and sent to national partners for review.				A. Zomov (expert on energy audit)			
- Model of the energy passport refined taking account of received comments.				A. Zomov (expert on energy audit)			
- Model of the energy passport and rating system completed and sent to the Ministry of Construction for confirmation.				A. Zomov (expert on energy audit), V. Shmidt (technical consultant)			
- Draft of instructions developed on how to complete energy passport forms.				A. Zomov (expert on energy audit)			
- Draft of instructions sent to national partners for review.				A. Zomov (expert on energy audit), M. Chao (International Chief Technical Advisor)			
- Draft of instructions refined taking account of received comments.				A. Zomov (expert on energy audit)			
1.3.2. Review of international best practice with regard to physical labeling of buildings in terms of energy performance, and development of written recommendations on applicability of a labeling system to newly designed, renovated, and/or existing buildings in Turkmenistan.				A. Zomov (expert on energy audit)			

	- Using information from review of world practices on energy passports, as well as assessment of local conditions, an analytic report prepared and delivered to the Ministry of Construction and the Ministry of Communal Services of Turkmenistan, enumerating these best practices and presenting recommendations on applicability of a labeling system to newly designed, renovated, and/or existing buildings in Turkmenistan.				A. Zomov (expert on energy audit), with assistance from International Consultant on building codes and rating systems			
	- Based on response of the Ministries, written plan developed for 2014 activity with regard to labeling of buildings in terms of energy performance.				A. Zomov (expert on energy audit), with assistance from International Consultant on building codes and rating systems			
Output 1.4 Development of new official normative document providing guidance on energy-efficient building design and compliance with new and revised codes, as building design beyond code requirements <i>Indicator 1: Official guidance manual developed, adopted and published by 2014, with</i>	1.4.1: Development and support for adoption and publication of an official design manual (code of practice) for architects and construction engineers on meeting new energy-efficiency requirements of building codes, as well as guidance on how to exceed required energy performance levels (with a target of 15-25% greater efficiency than code requirements).				A. Zomov (expert on energy audit), M. Bayramov (expert on building codes), M. Akhmedov (expert on construction), Ministry of Construction of Turkmenistan, Ministry of Communal Services of Turkmenistan			

<p><i>content consistent with new and revised building codes, as well as guidance on how to achieve greater energy efficiency than required</i></p>	<p>- Draft of guidance manual on design and construction of energy-efficient residential buildings prepared. (Contracts made under 1.2.2 with the nationally-licensed design institutes responsible for the revision of selected building codes include the development of guidance manual containing methodological instructions for each code practice).</p>					<p>A. Zomov (expert on energy audit), M. Bayramov (expert on building codes) and International Consultant on building codes and rating systems, M. Chao (International Chief Technical Advisor)</p>																			
<p>Outcome 2: Turkengas and other national agencies understand the potential for savings in its housing stock and have the capacity to identify and undertake investments in energy efficiency there.</p>							<p>GEF 6200 0</p>	<table border="1"> <tr> <td data-bbox="1693 582 1942 651">71200-International consultant</td> <td data-bbox="1942 582 2056 651">30,000</td> </tr> <tr> <td data-bbox="1693 651 1942 719">71400-Individual contracts</td> <td data-bbox="1942 651 2056 719">25,000</td> </tr> <tr> <td data-bbox="1693 719 1942 754">71600-Travel</td> <td data-bbox="1942 719 2056 754">10,000</td> </tr> <tr> <td data-bbox="1693 754 1942 823">72400-Communications</td> <td data-bbox="1942 754 2056 823">1,000</td> </tr> <tr> <td data-bbox="1693 823 1942 892">74200-Printing& publications</td> <td data-bbox="1942 823 2056 892">4,000</td> </tr> <tr> <td data-bbox="1693 892 1942 927">74500-Misc</td> <td data-bbox="1942 892 2056 927">1,500</td> </tr> <tr> <td data-bbox="1693 927 1942 995">75700-Trainings& workshops</td> <td data-bbox="1942 927 2056 995">6,000</td> </tr> <tr> <td data-bbox="1693 995 1942 1026">Total for GEF</td> <td data-bbox="1942 995 2056 1026">77,500</td> </tr> </table>	71200-International consultant	30,000	71400-Individual contracts	25,000	71600-Travel	10,000	72400-Communications	1,000	74200-Printing& publications	4,000	74500-Misc	1,500	75700-Trainings& workshops	6,000	Total for GEF	77,500	
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74500-Misc	1,500																								
75700-Trainings& workshops	6,000																								
Total for GEF	77,500																								
<p>Output 2.1 Analysis conducted on the most cost-effective means of reducing energy consumption in the residential sector of Ashgabat</p> <p><i>Indicator 1: 25 energy audits carried out by project (5</i></p>	<p>2.1.1: Comprehensive assessments of energy efficiency potential in existing residential buildings in Ashgabat will be prepared. Energy audits will be conducted for 5 buildings in 2013 (including the buildings selected as pilots for reconstruction), and for 10 buildings each in 2014 and 2015.</p>					<p>V. Schmidt (technical consultant), A. Zomov (expert on energy audit), Ministry of Communal Services of Turkmenistan.</p>																			

<p><i>planned for 2013, 10 each for 2014 and 2015). Completed documentation of findings and recommendations</i></p> <p>Indicator 2: Metered energy consumption monitored and evaluated annually for all selected buildings after initial energy audit</p>	- Data on existing types and quantities of residential buildings of the city of Ashgabat collected.					A. Zomov (expert on energy audit)			
	- Analysis of data carried out and report prepared.					A. Zomov (expert on energy audit)			
	- Types of residential buildings not included among those undergoing renovation as pilot projects selected for additional energy audits.					A. Zomov (expert on energy audit)			
	- Specific buildings selected for these additional energy audits.					A. Zomov (expert on energy audit)			
	- Approval obtained from the Ministry of Communal Services with regard to the buildings selected for additional energy audits.					A. Zomov (expert on energy audit)			
	- Surveying and energy assessment of all these buildings carried out according to methodology developed in 2012, with adjustments as needed.					A. Zomov (expert on energy audit), M. Chao (International Chief Technical Advisor)			
	- Energy-conservation improvement measures defined for these buildings.					V. Shmidt (technical consultant), A. Zomov (expert on energy audit), with assistance from International Consultant on building design (see Activity 3.1)			
	- Contracts finalized with national institutes for the implementation of initial energy inspections in selected building in other cities. (Tender, contract signed by May-June)					A. Zomov (expert on energy audit), I. Atamuradova (LED CM), PIU and UNDP Country Office			
	- Training on the implementation of energy inspections in buildings delivered to national institutes.					V. Shmidt (technical consultant), A. Zomov (expert on energy audit)			

- Energy inspections carried in selected buildings in other cities.					V. Shmidt (technical consultant), A. Zomov (expert on energy audit)			
- Terms of Reference developed and solicitation released for International Consultant on assessment of national economic potential of energy efficiency in buildings.					I. Atamuradova (LED CM), PIU and UNDP Country Office			
- International Consultant on assessment of national economic potential of energy efficiency in buildings hired. (Tender, contract signed by September)					I. Atamuradova (LED CM), PIU and UNDP Country Office			
- Calculation of savings over the operating lifetime of the building from the use of energy-conservation measures carried out, and energy efficiency supply curve constructed for all selected buildings.					V. Shmidt (technical consultant), A. Zomov (expert on energy audit)			
- Feasible and technically achievable potential of energy efficiency determined. "Scenarios of energy-efficiency recommendations" developed.					V. Shmidt (technical consultant), A. Zomov (expert on energy audit), with assistance from International Consultant on building design (see Activity 3.1)			
- Energy consumption in 6 existing pilot buildings equipped with energy metering devices is monitoring.					A. Zomov (expert on energy audit)			

	<p>2.1.2: Existing buildings selected as pilots for reconstruction (as well as similar buildings selected as baselines against which the pilot projects will be compared) will be equipped with building-level energy metering devices.</p> <p>- Heat meters and data loggers installed.</p>					<p>A. Zomov (expert on energy audit) Ministry of Communal Services of Turkmenistan</p>			
<p>Output 2.2 Responsible staff is trained in energy management and the identification of energy savings in the housing stock</p>	<p>2.2.1: Written recommendations on a system of energy management and monitoring in existing residential buildings will be established.</p>					<p>A. Zomov (expert on energy audit), V. Shmidt (technical consultant), I. Atamuradova (LED CM), PIU</p>			
<p>Indicator 1: <i>Creation and delivery to interested agencies of energy audit methodology and recommendations on energy management and monitoring system</i></p>	<p>- Compilation and review of documents on energy management and monitoring systems in other countries, including those in which UNDP/GEF projects have helped develop and implement these systems (especially Uzbekistan, Kazakhstan, and Croatia).</p>					<p>A. Zomov (expert on energy audit)</p>			

<p>Indicator 2: At least 30 professionals including Turkmengas staff trained by the end of the the first quarter of 2014</p> <p>Indicator 3: Energy audits and lessons learned published on the project internet site page by the end of the the fourth quarter of 2014</p>	- On the basis of the review of world practice, written recommendations prepared on energy management and monitoring systems for residential buildings in Turkmenistan. These recommendations will include inspection schedules, protocols and schedules for collection of data on energy consumption, and periodic assessment of potential for improved energy efficiency, with definition of duties of responsible parties at both the building level and the agency level.					A. Zomov (expert on energy audit)			
	- Written recommendations presented to Ministry of Communal Services of Turkmenistan, as well as other interested agencies.					A. Zomov (expert on energy audit)			
	- Based on response of the Ministry and other parties, training developed and delivered in support of implementation of energy management and monitoring.					A. Zomov (expert on energy audit), V. Shmidt (technical consultant), I. Atamuradova (LED CM), PIU			
	2.2.2: The energy audit methodology developed in 2.1.1 will be refined, written, and disseminated to the Ministry of Communal Affairs, building managers, and other interested parties, and also made available on the project's web page.					A. Zomov (expert on energy audit), V. Shmidt (technical consultant), I. Atamuradova (LED CM), PIU			

	- Energy audit methodology developed in 2012 and used in Activity 2.1.1 recorded as a formal document and presented to the Ministry of Communal Affairs of Turkmenistan.				A. Zomov (expert on energy audit), M. Chao (International Chief Technical Advisor)			
	- Comments from Ministry of Communal Affairs of Turkmenistan received and integrated into a revised version of the methodology.				A. Zomov (expert on energy audit)			
	- Final version of methodology approved, published, and disseminated to building managers and other interested parties, in print and/or web-based versions. (Tender, contract for printing signed by October)				A. Zomov (expert on energy audit), V. Shmidt (technical consultant), I. Atamuradova (LED CM), PIU			
	2.2.3: At least one training seminar on energy management and energy audit will be provided to the staff of the Ministry of Communal Affairs, as well as building managers and other interested parties.				A. Zomov (expert on energy audit), V. Shmidt (technical consultant), I. Atamuradova (LED CM), PIU			
	- Training materials on energy management and audit, including lessons learned from energy audits, prepared.				A. Zomov (expert on energy audit), V. Shmidt (technical consultant)			

	- Training seminar on energy management and audit, including lessons learned from energy audits conducted under Activity 2.1.1, organized and delivered to the staff of the Ministry of Communal Affairs, as well as building managers and other interested parties.					A. Zomov (expert on energy audit), V. Shmidt (technical consultant), I. Atamuradova (LED CM), PIU			
	2.2.4: Energy audit training materials, as well as results and lessons learned from the energy audits of 2.1.1, will be summarized, published in a written report, and also made publicly available at the project website.					A. Zomov (expert on energy audit) Turkmengas, Ministry of Communal Services of Turkmenistan , Ministry of Energy of Turkmenistan			
	- Training materials used in Activity 2.2.3, including results and lessons learned from the energy audits of Activity 2.1.1, summarized and made available in print and web-based versions.					A. Zomov (expert on energy audit), V. Shmidt (technical consultant), I. Atamuradova (LED CM)			
	- International and out-of -Ashgabat workshops, conferences on energy management and monitoring, visits of neighboring countries for learning experience from relevant projects.					I. Atamuradova (LED CM), M. Akhmedov (expert on construction), A. Zomov (expert on energy audit), V. Shmidt (technical consultant)			
Outcome 3: Energy-efficient design and technologies are incorporated and visually demonstrated in new and reconstructed residential buildings.							GEF 6200 0	71200-International consultant	31,000
								71400-Individual contracts	25,000
								71600-Travel	12,000
								72100-Contractual services	360,000

							72200-Equipment& Furniture	20,000
							72400-Communications	1,000
							74500-Misc	1,500
							75700-Trainings& workshops	5,000
							Total for GEF	455,500
<p>Output 3.1 Three new multi-unit residential buildings with significantly improved energy performance are designed and constructed</p> <p><i>Indicator 1: Pilot buildings with calculated energy consumption 15 percent less than required by code, and 5 percent less than prevailing best practice for elite buildings</i></p> <p><i>Indicator 2: Design completed by end of 2013</i></p> <p><i>Indicator 3: Construction completed and monitoring started by end of 2014</i></p>	<p>3.1.1 Site identification (jointly carried out by the Project Team and the developers).</p>					M. Akhmedov (expert on construction) Municipality of Ashgabat. Turkmengas, “Turkmenneftegazstroy”		
	<p>- Sites selected and all necessary approvals and signatures obtained from partner agencies.</p>					M. Akhmedov (expert on construction), V. Shmidt (technical consultant), I. Atamuradova (LED CM) with support from UNDP Country Office		
	<p>3.1.2.: Energy baseline consumption calculated for selected type of building based on metered and calculated energy consumption of similar buildings under similar conditions.</p>					V. Shmidt (technical consultant), A. Zomov (expert on energy audit), M. Akhmedov (expert on construction)		
	<p>- Correction of calculations of baseline energy consumption for the selected new pilot residential buildings, taking account of the comments of the International Chief Technical Advisor.</p>					V. Shmidt (technical consultant), A. Zomov (expert on energy audit), M. Akhmedov (expert on construction), M. Chao (International Chief Technical Advisor)		

	<p>3.1.3: Drafting technical specifications for the building performance design and engineering in selected demonstration buildings (jointly carried out by the Project Team, International Consultant on building design, the Technical Advisory Committee and the developers).</p>				<p>M. Akhmedov (expert on construction), Municipality of Ashgabat, “Turkmenneftgastroy”</p>			
	<p>- Terms of Reference developed and solicitation released for International Consultant on building design.</p>				<p>I. Atamuradova (LED CM) and M. Chao (International Chief Technical Advisor)</p>			
	<p>- International Consultant on building design hired. (Tender, contract signed by April)</p>				<p>I. Atamuradova (LED CM), PIU and UNDP Country Office</p>			
	<p>- Meetings held with design institutes and clients for discussion of the technical specifications, with the participation of the International Consultant on building design if possible.</p>				<p>M. Akhmedov (expert on construction), International Consultant on building design</p>			
	<p>- Commentary on the technical specifications for design and construction of new energy-efficient residential buildings, including comments from the International Consultant on building design, gathered and analyzed.</p>				<p>M. Akhmedov (expert on construction), International Consultant on building design, M. Chao (International Chief Technical Advisor)</p>			

	3.1.4: Development of project designs (carried out by the contracted designers with support of International Consultant on building design and feedback from Project Team and developers).				M. Akhmedov (expert on construction) “Turkmenneftegasstroy”, Municipality of Ashgabat			
	- Memoranda of understanding on the design and construction of EE pilot buildings signed by UNDP and Turkmenneftegasstroy and Municipality of Ashgabat.				M. Akhmedov (expert on construction), V. Shmidt (technical consultant), Ministry of construction of Turkmenistan, I. Atamuradova (LED CM), UNDP country office			
	- Contracts finalized with the nationally-licensed design institutes responsible for the design of the selected new residential buildings. (Waiver for 9-story building, contract signed by April)				M. Akhmedov (expert on construction), I. Atamuradova (LED CM), PIU and UNDP Country Office			
	- Mechanism for compilation and confirmation of initial design and cost estimation developed.				M. Akhmedov (expert on construction), International Consultant on building design, if possible			
	- The given mechanism agreed upon with clients (owners) of the residential buildings.				M. Akhmedov (expert on construction)			
	- Agreements finalized and formalized by contract on cost-sharing for design and material costs of the selected residential buildings.				V. Shmidt (technical consultant), M. Akhmedov (expert on construction), I. Atamuradova (LED CM), UNDP Country Office			
	- Designs of new energy-efficient buildings executed.				M. Akhmedov (expert on construction), International Consultant on building design, national design agencies			

	3.1.5: Acquisition of construction permits.					M. Akhmedov (expert on construction), national design agencies			
	- Submittal of design documentation through the required process of official approval by state agencies for plan review (Glavgosekspertiza), with any required corrections in response to agency remarks.					M. Akhmedov (expert on construction), national design agencies			
	3.1.6: Procurement of materials and equipment, construction, and construction oversight (additional construction oversight with a special focus on quality of energy efficiency construction details will be supported in addition to a standard construction oversight by the Project Team).					M. Akhmedov (expert on construction) “Turkmenneftgasstroy”, Municipality of Ashgabat, Ministry of construction of Turkmenistan			
	- Contracts finalized with the nationally-licensed construction organizations (contractors) responsible for construction of the selected new residential buildings. (Waiver 9-story building, contract signed by April and approved in Headquarters by May-June)					M. Akhmedov (expert on construction)			
	- List of equipment and materials needed for energy-efficient construction defined together with the contracted organizations.					M. Akhmedov (expert on construction), A. Zomov (expert on energy audit)			
	- Equipment and materials for energy-efficient construction purchased by the contracting organizations.					M. Akhmedov (expert on construction), A. Zomov (expert on energy audit)			

	- Meetings held with contracting organizations for discussion of questions of quality of implemented work and oversight over construction executed.				M. Akhmedov (expert on construction)			
	- Construction of three energy-efficient buildings is carried out.				M. Akhmedov (expert on construction)			
	- Oversight over construction executed, with site visits at least 1-2 times weekly during the construction stage.				M. Akhmedov (expert on construction)			
	- Workshop/round-table on energy-efficient design/reconstruction will be integrated with 4.2.				V. Shmidt (technical consultant), M. Akhmedov (expert on construction), I. Atamuradova (LED CM), PIU			
<p>Output 3.2 Three multiunit residential buildings are reconstructed with significantly improved energy performance</p> <p><i>Indicator 1: Three designs for reconstruction developed with at least 44% energy consumption reduction by the middle of 2013</i></p> <p><i>Indicator 2: Retrofits completed and monitoring started by the second quarter of 2014</i></p>	<p>3.2.2: Specification of methodology of baseline energy consumption in existing buildings and calculation of baseline energy consumption and energy performance of buildings selected for retrofits based on energy audits– jointly with Outcome 2 activities.</p>				M. Akhmedov (expert on construction) Ministry of Communal Services of Turkmenistan			
	- Correction of baseline calculations on renovated residential buildings, taking account of the comments of the International Technical Advisor.				M. Akhmedov (expert on construction), A. Zomov (expert on energy audit), V. Shmidt (technical consultant), M. Chao (International Chief Technical Advisor)			
	<p>3.2.3: Based on performed energy audits, drafting of technical specifications for the design of the building energy-efficient retrofit in the selected demonstration buildings.</p>				M. Akhmedov (expert on construction) Ministry of Communal Services of Turkmenistan			

- Consultation in Ashgabat with Rustam Kuchkarov, Team Leader from UNDP/GEF project on public buildings in Uzbekistan. (This activity should also apply to Outputs 1.2, 1.3, 1.4, and 3.1)					M. Akhmedov (expert on construction), A. Zomov (expert on energy audit), V. Shmidt (technical consultant)			
- Memorandum of understanding on the design and renovation of EE pilot retrofits signed by UNDP and the Ministry of Communal Services.					M. Akhmedov (expert on construction), V. Shmidt (technical consultant), Ministry of construction of Turkmenistan, I. Atamuradova (LED CM), UNDP country office			
- Contracts finalized with the nationally-licensed design institutes responsible for the design of the selected residential buildings to be renovated. (Waiver, contract signed by April)					M. Akhmedov (expert on construction), I. Atamuradova (LED CM), PIU, UNDP Country Office			
- Meetings held with design institutes and clients (owners) for discussion of technical specifications.					M. Akhmedov (expert on construction)			
- Technical specifications for energy-efficient renovation of existing residential buildings developed, taking account of results of energy audits conducted in 2012 and under Activity 2.1.1 above.					M. Akhmedov (expert on construction), A. Zomov (expert on energy audit), International Consultant on building design, M. Chao (International Chief Technical Advisor)			
- Commentary collected and analyzed on technical specifications for design and execution of energy-efficient renovation of existing residential buildings.					M. Akhmedov (expert on construction)			

	3.2.4: Development of designs (jointly carried out by the Project Team, International Consultants on energy audit and/or building design, and the developers).				M. Akhmedov (expert on construction) Ministry of Communal Services of Turkmenistan			
	- Mechanism developed for compilation and confirmation of initial design and cost estimation.				M. Akhmedov (expert on construction)			
	- The given mechanism agreed upon with the Ministry of Communal Services of Turkmenistan.				M. Akhmedov (expert on construction)			
	- Agreements finalized and formalized by contract on cost-sharing for design and material costs of the selected residential buildings to be renovated.				V. Shmidt (technical consultant), M. Akhmedov (expert on construction), I. Atamuradova (LED CM), UNDP Country Office			
	- Designs of energy-efficient renovation of three existing residential buildings implemented.				M. Akhmedov (expert on construction), International Consultant on building design			
	3.2.5: Reconstruction and specific energy efficiency oversight. The project reconstruction oversight will pay a special attention to the quality of energy efficiency construction details, such as elimination of thermal bridges, air and humidity tightness of insulated structures etc.				M. Akhmedov (expert on construction) Ministry of Communal Services of Turkmenistan			

- Contracts finalized with the nationally-licensed construction organizations (contractors) responsible for retrofitting the selected residential buildings. (Waiver, contract signed by April and approved by Headquarters by May-June)					M. Akhmedov (expert on construction)			
- List of equipment and materials needed for energy-efficient construction defined together with the contracted organizations.					M. Akhmedov (expert on construction), A. Zomov (expert on energy audit)			
- Equipment and materials for energy-efficient renovation purchased by the contracting organizations.					M. Akhmedov (expert on construction), A. Zomov (expert on energy audit)			
- Meetings held with contracting organizations for discussion of questions of quality of implemented work and execution of oversight over renovation work.					M. Akhmedov (expert on construction)			
- Energy-efficient renovation of three residential buildings is carried out.					M. Akhmedov (expert on construction)			
- Oversight over renovation is carried out, with site visits at least 1-2 times weekly during the installation stage.					M. Akhmedov (expert on construction)			
- Workshop/round-table on energy-efficient design/construction will be integrated with 4.2.					V. Shmidt (technical consultant), M. Akhmedov (expert on construction), I. Atamuradova (LED CM), PIU			

	- International and out-of-Ashgabat workshops, conferences on energy-efficient re-/construction, visits of neighboring countries for learning experience from relevant projects.					I. Atamuradova (LED CM), M. Akhmedov (expert on construction), A. Zomov (expert on energy audit), V. Shmidt (technical consultant)			
Output 3.3 Model energy passports developed for all pilot buildings and introduced through training Indicator 1: Energy passports and labels developed by the end of building re/construction – by the end of the year 2014	- Recommendations prepared for revision of the output and summarized in the Inception report; - Project board approved the Inception report and proposed revisions; - AWP and log frame are adjusted accordingly.					I. Atamuradova (LED CM), V. Shmidt (technical consultant), M. Bayramov (expert on building codes, M. Akhmedov (expert on construction), A. Zomov (expert on energy audit), M. Chao (International Chief Technical Advisor)			
Outcome 4: Replication facilitated via development of skills, prototype designs and policies for energy-efficient buildings.								71200-International consultant	21,000
								71400-Individual contracts	20,000
								71600-Travel	10,000
							GEF 6200 0	72400-Communications	1,000
								74200-Printing& publications	7,000
								74500-Misc.	1,500
								75700-Trainings& workshops	6,000
								Total for GEF	66,500

<p>Output 4.1 Protocols for energy-efficient design/retrofits in the three most common prototype residential building designs developed and applied</p> <p>Indicator 1: <i>Training on EE building re/construction, experience from implementing integrated building design delivered to minimum 50 practitioners and decision makers</i></p>	<ul style="list-style-type: none"> - Recommendations prepared for revision of the output and summarized in the Inception report; - Project board approved the Inception report and proposed revisions; - AWP and log frame are adjusted accordingly. 				<p>I. Atamuradova (LED CM), V. Shmidt (technical consultant), M. Bayramov (expert on building codes, M. Akhmedov (expert on construction), A. Zomov (expert on energy audit), M. Chao (International Chief Technical Advisor)</p>			
<p>Output 4.2 Design institutes and major housing developers are trained in and encouraged to incorporate advanced energy efficiency in residential building design</p>	<p>4.2.1: Training seminars on energy-efficient building re/construction, experience from implementing integrated building design delivered to at least 50 architects and/or engineers.</p>				<p>M. Akhmedov (expert on construction), A. Zomov (expert on energy audit), V. Shmidt (technical consultant) I. Atamuradova (LED CM), PIU</p>			
<p>Indicator 1: <i>Training on energy-efficient building re/construction, experience from implementing integrated building design delivered to at least 50 architects and/or engineers</i></p>	<ul style="list-style-type: none"> - Materials for training seminars prepared. 				<p>M. Akhmedov (expert on construction), A. Zomov (expert on energy audit), M. Bayramov (expert on building codes), International Consultant on building design, and International Consultant on building codes and rating systems</p>			

<p>Indicator 2: Course materials on energy efficient building design and re/construction developed and delivered to at least 30 students by the end of 2014</p>	<p>- Training seminars held.</p>					<p>M. Akhmedov (expert on construction), A. Zomov (expert on energy audit), M. Bayramov (expert on building codes), V. Shmidt (technical consultant) I. Atamuradova (LED CM), PIU, International Consultant on building design, and (if possible) International Consultant on building codes and rating systems</p>			
<p>Output 4.3 Recommendations from the project are incorporated into energy efficiency policies and programs Indicator 1: Executive reports and at least one high-level meeting on project findings, lessons learned and recommendations for policy makers developed and delivered to key governmental and regional policy makers by the end of the third quarter of 2015</p>	<p>4.3.1: Ongoing communication and regular distribution of project findings between project personnel with all project partners and key stakeholders, such as the Ministry of Construction, governmental institutions responsible for developing and implementing policies related to energy efficiency.</p>					<p>M. Akhmedov (expert on construction), A. Zomov (expert on energy audit), V. Shmidt (technical consultant) I. Atamuradova (LED CM), PIU</p>			
<p>Indicator 2: Project web page (with Russian and English translation) operational by the end of the year 2012 and</p>	<p>- Plan of activities developed for informing partners and interested parties, including meetings of the Project Board and the Technical Advisory Committee.</p>					<p>M. Akhmedov (expert on construction), A. Zomov (expert on energy audit), V. Shmidt (technical consultant)</p>			
	<p>- Work carried out in accordance with this plan.</p>					<p>M. Akhmedov (expert on construction), A. Zomov (expert on energy audit), V. Shmidt (technical consultant) I. Atamuradova (LED CM), PIU</p>			

<p>updated regularly over the whole project implementation period</p> <p>Indicator 3: Provisions with local partner concluded by the end of the project on ongoing operation of the project web site for minimum next 5 years after project termination</p>	<p>4.3.2: Preparation of brief reports and recommendations intended for high-level government officials on key policy issues addressed under the project (e.g. demand-side management programs, mainstreaming energy efficiency issues into housing policy, integrated building design of low-cost low-energy buildings, etc.).</p>					<p>A. Zomov (expert on energy audit), V. Shmidt (technical consultant) Ministry of Communal Services of Turkmenistan , Ministry of construction of Turkmenistan</p>			
	<p>- Brief report prepared on the importance and expected benefits of new and revised building energy codes and energy passports.</p>					<p>M. Bayramov (expert on building codes), A. Zomov (expert on energy audit) with assistance from International Consultant on building codes and rating systems</p>			
	<p>4.3.3: Organization of a high-level round-table meeting for policy/decision makers to review the executive reports.</p>					<p>V. Shmidt (technical consultant) I. Atamuradova (LED CM)</p>			
	<p>- Round table on building codes with decision makers organized and held.</p>					<p>V. Shmidt (technical consultant) I. Atamuradova (LED CM)</p>			
	<p>4.3.6: Maintain project website with up-to-date information on project results, information developed and experienced learned. Key results and materials to be published in Russian as well as in English for international audience.</p>					<p>M. Bayramov (expert on building codes), A. Zomov (expert on energy audit), V. Shmidt (technical consultant) I. Atamuradova (LED CM)</p>			
	<p>- Overview report and recommendations on new building codes and regulations published on the project's website.</p>					<p>M. Bayramov (expert on building codes)</p>			

	- Report on energy audit of pilot buildings undergoing renovation published on the project's website.					A. Zomov (expert on energy audit)			
	- International and out-of -Ashgabat workshops, conferences on energy-efficient practices and policies, visits of neighboring countries for learning experience from relevant projects.					I. Atamuradova (LED CM), M. Akhmedov (expert on construction), A. Zomov (expert on energy audit), V. Shmidt (technical consultant)			
Outcome 5: Project Management									
	- LED Component Manger, Head of PIU						GEF 6200 0	71400-Individual contracts	38,000
	- International conferences, workshops							71600-Travel	5,000
	- Supplies for LED CM and Project team							72400-Communications	6,000
	- Internet and mobile communication							72500-Office supplies	3,000
	- ICT equipment							72800-ICT equipment	2,000
	- Bank charges other misc.							74500-Misc.	6,000
	- Project Boards and Expert Consultative Committee Meetings							75700-Trainings& workshops	4,000
								Total for GEF	64,000
	- Office supplies for PIU and Project teams						UND P 0400 0	72500-Office supplies	5,000
	- Room rent, other misc.							74500-Misc.	5,000
								Total for UNDP	10,000
								GRAND TOTAL	730,000

Annex 2. Annual Work Plan, 2012

Project activities and a time plan for Q2 and Q3 of 2012

Activity Code	Activity Description	2012			Budget Th. USD
		Q3	Q4		
0.1	Renegotiate with key project partners co-financing commitment for pilot buildings and energy metering	X			
0.2	Establishment of a Local Expert Advisory Board	X			
1.1.1	Establishment of a working group on an incentive program for energy efficient buildings	X			
1.1.2	Review and analysis of international energy efficiency incentive programs	X			
1.1.3	Draft incentive program developed		X		
1.1.4	Discuss options with the working group and finalize the proposed incentive program		X	tbc.	
1.2.1.	Review of international building thermal insulation and energy efficiency performance codes, energy passport and building labeling schemes		X	tbc.	
2.1.1	DSM study on energy efficiency potential in existing residential buildings	X	X	tbc.	
2.1.2	Procurement and installation of building level energy metering devices in selected typical building representatives	X			
2.1.3	Energy consumption in selected typical building representatives metered and monitored		X	tbc.	
2.2.2	Energy auditing methodology developed		X	tbc.	
2.2.3	Energy audits in selected existing pilot buildings		X		
3.1.1	Selection of new pilot buildings to be constructed	X			
3.1.2	Energy baseline consumption calculated	X	X		
3.1.3	Drafting technical specifications for the building performance design		X	tbc.	
3.1.4	Start of development of project designs		X	tbc.	
3.2.1	Specification of pilot buildings to be reconstructed	X			
3.2.2	Specification of methodology of baseline energy consumption	X	X	tbc.	
3.2.3	Drafting technical specifications for the design of the building EE retrofit		X	tbc.	
4.2.6	Organization of a study		X		
4.3.6	Launch of a project website	X	X	tbc.	

Note: "tbc." indicates activity to be continued in 2013

The total budget for Year 1 has been planned to be 480 280 USD. The structure of the Year 1 budget is as follows:

Outcome 1 70 kUSD
 Outcome 2 100 kUSD
 Outcome 3 170 kUSD
 Outcome 4 70 kUSD
 Project management: 70.28 kUSD
Total Year 2012 budget: 480 280 USD

Annex 3. Terms of Reference of Project Team Specialists

In Russian:

Terms of Reference of Energy Efficiency Building Code Specialist
Terms of Reference of Specialist on Construction of Residential Buildings
Terms of Reference of Energy Audits Specialist

Terms of Reference of Energy Efficiency Building Code Specialist

ТЕХНИЧЕСКОЕ ЗАДАНИЕ

Должность: Специалист по строительным нормативным документам

Проект: «Улучшение эффективности использования энергии в секторе жилищного строительства Туркменистана»

Продолжительность: 12 месяцев (с возможностью продления)

Тип контракта: Сервисный Контракт

Местонахождение: Ашхабад, Туркменистан

Проект нацелен на уменьшение выбросов парниковых газов путем улучшения управления энергией и сокращения потребления энергии в жилом секторе Туркменистана. Проект усилит стимулы и потенциал для строительства высоко-энергосберегающих зданий; создаст потенциал конечного сбережения энергии в жилом фонде Ашхабада и внедрения улучшенных высокоэффективных норм среди проектировщиков и застройщиков. Срок выполнения проекта составляет 4 года с 2012 по 2015 год включительно.

Цель технического задания – способствовать достижению следующих стратегических результатов проекта:

- Новый (пересмотренный) энергосберегающий строительный нормативный документ разработан и принят к исполнению;
- Минимум 30 ключевых государственных (муниципальных) чиновников и 40 профессионалов обучены и могут соблюдать нормы кодекса;
- Инструкции, регулирующие строительные энергетические параметры и система энергетических паспортов и маркировки разработаны и выполняются;
- Энергетические паспорта и энергетические ярлыки разработаны;
- Руководящие материалы по программам стимулирования и обучению разработаны и распространены;
- Минимум 50 национальных профессионалов обучены лучшим международным практикам в области энергосберегающего строительства/реконструкции;
- Исполнительные отчеты по проектным данным, полученным урокам и рекомендациям для лиц, принимающих важные решения, разработаны, распространены и включены в стратегии.

Обязанности:

Специалист по строительным нормативным документам осуществляет свою деятельность под общим стратегическим руководством Программного менеджера по развитию зеленой экономики и непосредственным руководством Технического Советника проекта, в сотрудничестве и координации с другими специалистами проекта, международными и национальными консультантами и организациями.

Основные задачи:

- Разработка и принятие новых (пересмотренных) энергосберегающих строительных нормативных документов для Туркменистана, включающих компонент эффективного использования энергии;
- Разработка модели энергетического паспорта на основе лучшей международной практики и с учетом местных условий и их заполнение;
- Подготовка технических отчетов проекта по своему компоненту;
- Участие в подготовке и корректировке текущего рабочего плана и графика работы с партнерами по согласованию со Старшим техническим консультантом;
- Своевременное и качественное выполнение задач проекта в соответствии с рабочим планом, проектным документом и поручениями Технического Советника проекта;
- Совместно с международными экспертами и национальными партнерами участвовать в решении вопросов, возникающих в ходе выполнения проекта

- Постоянная коммуникация и регулярный обмен полученными проектом данными между всеми партнерами и заинтересованными сторонами проекта;
- Участие в подготовке, организации и проведении мероприятий проекта;
- Выполнение иных заданий по запросу Технического Советника проекта, направленных на достижение целей и задач проекта.

Основные функции:

- Обзор международных норм по теплоизоляции зданий и параметрам использования энергии, схем энергетических паспортов и маркировки зданий, лучших практик и тенденций в СНГ, Евро Союза и других развитых странах. Обзор местных строительных нормативных документов и определение требуемых изменений. Составление краткого отчета и рекомендаций по новым строительным нормативным документам, которые будут разработаны в Туркменистане, включая методику расчета энергетических параметров и систему информирования общественности об энергетических характеристиках новых, реконструированных домов (энергетические паспорта, маркировка).
- Разработка новых (пересмотренных) энергосберегающих строительных нормативных документов для Туркменистана, включающих компонент эффективного использования энергии, а также конкретизирующих метод расчетов энергетических характеристик.
- Экспертная поддержка Министерству строительства и лицам, принимающим решения по вопросам принятия новых энергосберегающих строительных нормативных документов.
- Разработка и содействие в согласовании с соответствующими заинтересованными сторонами, включая Министерство строительства, рекомендаций по улучшению организационных структур, отчетности и подбору персонала, для «Главгосэкспертизы».
- Разработка и содействие в согласовании Министерством строительства стратегического плана для периодической проработки строительных норм с целью изыскания более жестких требований в части энергетических характеристик зданий.
- Разработка документов, которые конкретизируют обязанности ответственных сторон по вопросу реализации энергетических паспортов/ярлыков и систему общественной информированности в области энергетических параметров (паспорт/маркировка) новых спроектированных или отремонтированных домов.
- Экспертная поддержка Министерству строительства в принятии нового законодательного документа.
- Разработка модели энергетического паспорта на основе лучшей международной практики и с учетом местных условий.
- Организация и участие в проведении серии тренингов для государственных чиновников, принимающих стратегические решения и соответствующих профессионалов, включая персонал «Главгосэкспертизы» - по вопросам новых строительных нормативных документов, учитывающих энергетические параметры, методы расчетов энергетических параметров и лучшие практики соблюдения этих документов, а также по вопросам новой системы энергетических паспортов /маркировок, новых энергетических строительных нормативных документов, их использованию и применению;
- Заполнение энергетических паспортов/маркировок по всем пилотным зданиям; их публикация в соответствии с разработанным положением. Проведение аудита характеристик совместно со Специалистом по энергетическому аудиту.
- Подготовка материалов для публикации брошюры с разъяснениями относительно модели энергетического паспорта. Содействие в распространении брошюры среди городских и районных администраций.
- Разработка инструкций для архитекторов и инженеров-строителей по соблюдению высокоэффективного стандарта.
- Подготовка и организация тренинга и информационного семинара с участием международного консультанта для архитекторов, проектировщиков, инженеров по строительству, отоплению, вентиляции, кондиционированию и государственных должностных лиц на тему комплексного проектирования.
- Подготовка исполнительных отчетов по разработке новых (пересмотренных) энергосберегающих строительных нормативных документов и энергетического паспорта.
- Содействие в распространении исполнительных отчетов и полученных уроков среди администраций других регионов страны и среди государственных учреждений, осуществляющих жилищное строительство.
- Подготовка ежемесячных, ежеквартальных и годового технических отчетов о выполненных работах.
- Подготовка информации для обновления информации на региональном веб-сайте проекта.

Требуемые навыки:

- Способность и навыки анализа и обобщения полученного материала;
- Хорошие организационные и профессиональные навыки;
- Умение строить профессиональные взаимоотношения с руководителями государственных структур другими заинтересованными сторонами проекта, демонстрируя дипломатичность и такт;
- Инициативность и способность ведения диалога с руководителями государственных структур;

- Умение достигать консенсус и положительно относиться к критическим замечаниям;
- Способность эффективно работать в условиях ограниченных сроков выполнения заданий;
- Навыки межличностного общения, ведения переговоров, способность работать в многонациональной среде с учетом гендерных аспектов;
- Способность эффективно работать в коллективе.

Требуемая квалификация:

- Диплом о высшем образовании в области теплотехники / строительства / энергетики или других смежных областях;
- Минимум 5 лет опыта работы в системе проектирования, строительства или эксплуатации жилых домов. Хорошее понимание вопросов энергоэффективности, процедур по введению и внедрению новых строительных норм и правил;
- Опыт работы с международными организациями/проектами;
- Умение пользоваться компьютером и информационными технологиями;
- Отличное знание туркменского и русского языков; знание английского языка предпочтительно.

Terms of Reference of Specialist on Construction of Residential Buildings

ТЕХНИЧЕСКОЕ ЗАДАНИЕ

Должность: Специалист по строительству жилых домов

Проект: «Улучшение эффективности использования энергии в секторе жилищного строительства Туркменистана»

Продолжительность: 12 месяцев (с возможностью продления)

Тип контракта: Сервисный Контракт

Местонахождение: Ашхабад, Туркменистан

Проект нацелен на уменьшение выбросов парниковых газов путем улучшения управления энергией и сокращения потребления энергии в жилом секторе Туркменистана. Проект усилит стимулы и потенциал для строительства высоко-энергосберегающих зданий; создаст потенциал конечного сбережения энергии в жилом фонде Ашхабада и внедрения улучшенных высокоэффективных норм среди проектировщиков и застройщиков. Срок выполнения проекта составляет 4 года с 2012 по 2015 год включительно.

Цель технического задания – способствовать достижению следующих стратегических результатов проекта:

- Программа стимулирования для проектирования энергоэффективных домов разработана и действует;
- К концу проекта программа стимулирования принята минимум одним застройщиком жилья;
- Три проекта новых многоквартирных жилых дома со значительно улучшенными энергетическими характеристиками разработаны;
- Строительство трех новых энергосберегающих домов начато;
- Три новых энергоэффективных дома построены;
- Проекты энергоэффективной реконструкции трех домов подготовлены;
- Реконструкция трех энергоэффективных домов начата;
- Реконструкция трех энергоэффективных домов закончена;
- Принципы энергоэффективного строительства, концепции модельных домов и инструкций по проектированию разработаны и применены в других 25 новых (реконструированных) зданиях;
- Минимум 50 практикующих профессионалов и лиц, принимающих стратегические решения обучены энергоэффективному строительству (реконструкции) домов, опыту применения комплексного проектирования зданий;
- Университетская учебная программа по проектированию и реконструкции энергосберегающих домов разработана и выполняется;
- Исполнительные отчеты по проектным данным, полученным урокам и рекомендациям для лиц, принимающих важные решения, разработаны, распространены и включены в стратегии.

Обязанности:

Специалист по строительству осуществляет свою деятельность под общим стратегическим руководством Программного менеджера по развитию зеленой экономики и непосредственным руководством Технического советника проекта, в сотрудничестве и координации с другими специалистами проекта, международными и национальными консультантами и организациями.

Основные задачи:

- Определение участков строительства новых домов. Определение критериев и выбор домов подлежащих реконструкции;
- Надзор за строительством и реконструкцией в дополнение к общепринятому надзору за строительством;
- Постоянное документирование проектных и строительных работ;
- Разработка учебной программы для студентов архитектурного строительного и теплотехнического факультетов;
- Организация национального конкурса для студентов архитектурного и инженерного факультетов на проектирование высокоэффективных домов, энергетические характеристики которых минимум на 30% превосходят стандарты текущих строительных норм и правил;
- Подготовка технических отчетов проекта по своему компоненту;
- Участие в подготовке и корректировке текущего рабочего плана и графика работы;
- Своевременное и качественное выполнение задач проекта в соответствии с рабочим планом, проектным документом и поручениями Технического советника проекта;
- Совместно с международными экспертами и национальными партнерами участвовать в решении вопросов, возникающих в ходе выполнения проекта;
- Постоянная коммуникация и регулярный обмен полученных проектом данных между всеми партнерами и заинтересованными сторонами проекта;
- Участие в подготовке, организации и проведении мероприятий проекта;
- Выполнение иных заданий по запросу Технического советника проекта, направленных на достижение целей и задач проекта.

Основные функции:

- Обзор и анализ международных программ и конкурсов стимулирования по разработке энергоэффективных проектов.
- Определение критериев выбора стимулов и разработка проекта программы стимулирования для поощрения проектных институтов по разработке энергоэффективных проектов.
- Обсуждение с рабочей группой альтернатив и выбор формы программы стимулирования по разработке энергоэффективных проектов.
- Подготовка проекта «бизнес-плана» по организации программы стимулирования.
- Презентация предложенной программы (конкурса) ключевым заинтересованным сторонам. Сбор комментариев для включения в окончательный вариант.
- Выработка окончательного варианта программы для презентации лицам, принимающим решения и публикации в СМИ.
- Принятие и объявление программы стимулирования (конкурса) на государственном уровне. Содействие выполнению программы.
- Подготовка исполнительного отчета по программе (конкурсу) стимулирования для поощрения проектных институтов за энергоэффективные проекты.
- Определение участка строительства новых пилотных домов. Определение критериев и выбор домов подлежащих реконструкции; оценка исходных параметров для типовых зданий в сходных условиях.
- Составление проекта технических требований для тендера по параметрам здания, проекту здания и инженерных систем в выбранных демонстрационных и реконструируемых домах.
- Разработка концептуального проекта; участие в разработке проектной документации; проработка концепций и проектной документации с Консультативным Советом проекта; участие в разработке трех детальных проектов.
- Надзор за строительством и реконструкцией в дополнение к общепринятому надзору за строительством, с особым фокусом на качество строительных деталей.
- Регулярное документирование проектных и строительных работ, включая детальные планы и полученные уроки. Распространение информации через веб-сайт проекта, а также посредством целевых семинаров, презентаций и в СМИ.
- Разработка протоколов (информационных справочников) по энергоэффективному строительству и реконструкции минимум для трех типовых проектов и трех проектов по реконструкции. Их просмотр и обсуждение с участием практикующих архитекторов и застройщиков жилья. Публикация и распространение протоколов (информационных справочников) среди всех заинтересованных проектных институтов, застройщиков и владельцев жилья.
- Организация тренинга для 50 практикующих архитекторов и инженеров, включая адаптивное обучение материалов и формата тренинга по вопросу комплексного проектирования домов (обзор мер по сокращению потребления энергии для отопления, охлаждения и освещения).
- Разработка учебной программы для студентов архитектурного и строительного факультетов, включая адаптацию учебных материалов; разработка формата тренинга и пакета обучающих материалов для использования в профессиональных академических учебных курсах.

- Организация национального конкурса для студентов архитектурного и инженерного факультетов на проектирование энергоэффективных домов, энергетические характеристики которых минимум на 30% превосходят стандарты текущих строительных норм и правил.
- Подготовка ежемесячных, ежеквартальных и годового технических отчетов о выполненных работах.

Требуемые навыки:

- Способность и навыки анализа и обобщения полученного материала;
- Хорошие организационные и профессиональные навыки;
- Умение строить профессиональные взаимоотношения с руководителями государственных структур и другими заинтересованными сторонами проекта, демонстрируя дипломатичность и такт;
- Инициативность и способность ведения диалога с руководителями государственных структур;
- Умение достигать консенсус и положительно относиться к критическим замечаниям;
- Способность эффективно работать в условиях ограниченных сроков выполнения заданий;
- Навыки межличностного общения, ведения переговоров, способность работать в многонациональной среде с учетом гендерных аспектов;
- Способность эффективно работать в коллективе.

Требуемая квалификация:

- Диплом о высшем образовании в области строительства / энергетики или других смежных областях;
- Минимум 5 лет опыта работы в системе проектирования, строительства или эксплуатации жилых домов. Хорошее понимание вопросов энергоэффективности, процедур по ведению надзора за ходом строительства;
- Опыт работы с международными организациями/проектами;
- Умение пользоваться компьютером и информационными технологиями;
- Отличное знание туркменского и русского языков; знание английского языка предпочтительно.

Terms of Reference of Energy Audits Specialist

ТЕХНИЧЕСКОЕ ЗАДАНИЕ

Должность: Специалист по энергетическому аудиту

Проект: «Улучшение эффективности использования энергии в секторе жилищного строительства Туркменистана»

Продолжительность: 12 месяцев (с возможностью продления)

Тип контракта: Сервисный Контракт

Местонахождение: Ашхабад, Туркменистан

Проект нацелен на уменьшение выбросов парниковых газов путем улучшения управления энергией и сокращения потребления энергии в жилом секторе Туркменистана. Проект усилит стимулы и потенциал для строительства высоко-энергосберегающих зданий; создаст потенциал конечного сбережения энергии в жилом фонде Ашхабада и внедрения улучшенных высокоэффективных норм среди проектировщиков и застройщиков. Срок выполнения проекта составляет 4 года с 2012 по 2015 год включительно.

Цель технического задания – способствовать достижению следующих стратегических результатов проекта:

- 25 энергетических аудитов проведено в 25 домах;
- Исследование по потенциалу эффективного использования энергии со стороны потребления разработано;
- Замеренное потребление энергии проконтролировано и оценено ежегодно минимум для 5 домов;
- Минимум 30 профессионалов обучены вопросам управления энергией и определения экономии энергии в секторе жилищного строительства;
- Энергетические аудиты и полученные уроки опубликованы на региональном веб-сайте;
- Кратко- и долгосрочный план инвестиций для жилого фонда Ашхабада разработан;
- Фактическое потребление энергии новых построенных и реконструированных домов проконтролировано и оценено;
- Исполнительные отчеты по проектным данным, полученным урокам и рекомендациям для лиц, принимающих важные решения, разработаны, распространены и включены в стратегии.

Обязанности

Специалист по энергетическому аудиту осуществляет свою деятельность под общим стратегическим руководством Программного менеджера по развитию зеленой экономики и непосредственным

руководством Технического советника проекта, в сотрудничестве и координации с другими специалистами проекта, международными и национальными консультантами и организациями.

Основные задачи:

- Подготовка всестороннего исследования по потенциалу эффективного использования энергии со стороны потребления;
- Определение рентабельного, технического и достижимого потенциала эффективного использования энергии по всему жилищному сектору Ашхабада;
- Проведение мониторинга и энергоаудита в существующих, вновь построенных и реконструированных домах;
- Разработка проекта кратко- и среднесрочного плана капиталовложений в ремонт существующих зданий с целью улучшения эффективности использования энергии;
- Подготовка технических отчетов проекта по своему компоненту;
- Содействие в подготовке и корректировке текущего рабочего плана и графика работы;
- Своевременное и качественное выполнение задач проекта в соответствии с рабочим планом, проектным документом и поручениями Технического советника проекта;
- Совместно с международными экспертами и национальными партнерами участвовать в решении вопросов, возникающих в ходе выполнения проекта.
- Постоянная коммуникация и регулярный обмен полученных проектом данных между всеми партнерами и заинтересованными сторонами проекта;
- Участие в подготовке, организации и проведении мероприятий проекта;
- Выполнение других заданий по запросу Технического советника проекта проекта, направленных на достижение целей и задач проекта.

Основные функции:

- Подготовка всестороннего исследования по потенциалу эффективного использования энергии со стороны потребления.
- Выбор 3-5 типов домов из всего жилого сектора и проведение детального энергетического аудита по типовым домам, выбранным для пилотной реконструкции. Оценка потенциала эффективности использования энергии по каждому типовому дому, на основе анализа энергетического аудита. Расчет экономии на протяжении жизненного цикла – от применения энергосберегающих мер. Определение рентабельного, технического и достижимого потенциала эффективного использования энергии по всему жилищному сектору.
- Составление спецификации для закупки (при необходимости) базового оборудования для контроля энергии в зданиях (регистраторы данных).
- Организация установки устройств, измеряющих энергопотребление на уровне здания, в домах, выбранных для экспериментального ремонта с целью эффективного использования энергии.
- Регулярное отслеживание потребления энергии в избранных типовых экземплярах домов измерительными устройствами. Оценка на протяжении всего срока выполнения проекта потребления энергии, внутренней и внешней температуры и других погодных условий (солнечный свет и т.д.). Ежегодная подготовка отчетных докладов.
- Разработка методики пост-проектного мониторинга парниковых газов, которая будет оценивать сокращения парниковых газов в экспериментальных домах (в сравнении с исходными данными), ожидаемую и достигнутую экономию энергии. Принятие решения по вопросу – кто из местных партнеров (университет, государственное учреждение) будет заниматься мониторингом энергии и выбросами парниковых газов после завершения проекта. Мониторинг и оценка параметров вновь построенных и реконструированных домов. Анализ на основе измеренного потребления всех энергоносителей и ежегодная подготовка отчетного доклада.
- Проведение исходных аудитов по энергетическим параметрам зданий, выбранных для ремонта; сбор данных для проектных требований.
- Подготовка и участие в проведении обучающих семинаров по вопросам управления энергией, энергетического аудита и основ комплексного планирования ресурсов со стороны потребления для экспертов из местных государственных учреждений, а также заинтересованных частных компаний. Энергетические аудиты, разработанные и подготовленные для пилотных проектов и исследования использования энергии со стороны потребления будут использованы во время обучения в качестве моделей. Разработка дополнительных аудитов (идентификация потенциала экономии энергии) в качестве практического обучения.
- Проведение энергоаудитов в существующих домах.
- Обобщение обучающих материалов по энергетическому аудиту, а также опыта и результатов, полученных от модельных энергоаудитов и подготовка для их размещения на региональном веб-сайте проекта.
- Разработка проекта кратко- и среднесрочного плана капиталовложений в ремонт существующих зданий с целью улучшения эффективности использования энергии на основе разработанного исследования использования энергии со стороны потребления и в сотрудничестве с «Туркменгазом», Министерством строительства, Министерством коммунального хозяйства и хякимликом Ашхабада,.

- Осуществление презентации инвестиционного плана Министерству коммунального хозяйства и другим правительственным организациям и лицам, принимающим решения, с целью обеспечения поддержки плана в процессе одобрения.
- Подготовка ежемесячных, ежеквартальных и годовых технических отчетов о выполненных работах.

Требуемые навыки:

- Способность и навыки анализа и обобщения полученного материала;
- Хорошие организационные и профессиональные навыки;
- Умение строить профессиональные взаимоотношения с руководителями государственных структур другими заинтересованными сторонами проекта, демонстрируя дипломатичность и такт;
- Инициативность и способность ведения диалога с руководителями государственных структур;
- Умение достигать консенсус и положительно относиться к критическим замечаниям;
- Способность эффективно работать в условиях ограниченных сроков выполнения заданий;
- Навыки межличностного общения, ведения переговоров, способность работать в многонациональной среде с учетом гендерных аспектов;
- Способность эффективно работать в коллективе.

Требуемая квалификация:

- Диплом о высшем образовании в области энергетики / строительства или других смежных областях;
- Минимум 5 лет опыта работы в системе проектирования, строительства или эксплуатации жилых домов. Хорошее понимание вопросов энергоэффективности, процедур по ведению энергетического аудита;
- Опыт работы с международными организациями/проектами;
- Умение пользоваться компьютером и информационными технологиями;
- Отличное знание туркменского и русского языков; знание английского языка предпочтительно.

Annex 4. Terms of Reference of International Consultants



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TERMS OF REFERENCE

I. Position Information

Position Title:	International Chief Technical Adviser (ICTA)
Type:	IC contract
Project Title:	Improving Energy Efficiency in the Residential Buildings Sector of Turkmenistan
Duration of the service:	30 working days in the period of November 2012 to April 2013 (1st period)
Duty station:	Home-based with one mission to Ashkhabad
Reports to:	Low-Emission Development Programme Component Manager, UNDP Turkmenistan

II. Background Information

The project objective is to reduce greenhouse gas emissions by improving energy management and reducing energy consumption in the residential sector in Turkmenistan.

The project has been designed to:

- strengthen incentives and capacity to build highly energy-efficient buildings,
- develop capacity at Turkmengas to identify end-use energy savings in its housing stock and implement investments to reduce end-use energy consumption,
- introduce improved highly-efficient design measures to major housing designers and developers, and
- replicate these measures through protocols for energy-saving measures in prototype buildings and through mainstreaming EE issues into state construction and housing policies and programs.

The project seeks to reduce energy consumption and associated greenhouse gases in residential sector in Turkmenistan and is structured into four project components:

1. Energy efficient building codes and supporting capacity strengthening
2. Demand-side management: partnership with Turkmengas
3. Improved design measures for major residential consumers
4. Replication through partnership with other developers and support for policies that encourage energy efficiency

At present, neither new construction nor refurbishment projects consider the energy performance of the buildings involved. The buildings being constructed and refurbished now without any attention to energy efficiency are effectively “locking in” patterns of energy consumption – and associated greenhouse gas emissions -- for the next several decades that needlessly high. Even before the construction boom, emissions in the residential sector totalled more than 3 million tonnes of CO₂, or nearly 10% of total CO₂ emissions from fuel combustion. Now, these emissions play an increasing role in the overall share of greenhouse gas emissions in Turkmenistan, and the residential sector are the third largest source of emissions in the country. Without intervention, these emissions will continue to grow unchecked.

Management Arrangements:

Under the overall guidance of the UNDP Low-Emission Development Programme Component Manager, and direct supervision of International Chief Technical Advisor (ICTA), the ICTA will work closely with Project Team consultants, international and national consultants.

The total and exact number of working days and missions to Turkmenistan will be provisionally agreed between the ICTA and UNDP in Turkmenistan at the commencement of the contract. The ICTA is expected to serve as long-term consultant.

III. Functions / Key Outputs Expected

The role of the ICTA will remain critical throughout the project as he/she will continue to have inputs on key technical decisions at strategic moments in the project implementation through field missions and remote communication.

The ICTA will be tasked with the following duties and responsibilities:

- advise the project team directly in effective and timely project implementation;
- provide overall project advisory services and technical assistance to Low-Emission Programme Component Manager, Project Technical Adviser, Project Team consultants and other project consultants;
- ensure that the overall technical direction of the project is maintained and flexibly adapted to meet the practical challenges faced during the implementation of the project;
- provide technical guidance on the implementation of key components/activities of the project.

Thematic functions:

1. Energy efficient building codes and supporting capacity strengthening:

- Provide overall coordination in drafting an incentive program for designing energy efficient buildings and in formulating a roadmap to organize the incentive program;
- Provide overall coordination in revising buildings codes which include energy efficiency performance component with incorporation of feasible and cost-effective best practices for energy efficiency, and specifying method of energy performance calculation
- Provide overall coordination of capacity-building of the Ministry of Construction with regard to implementation and enforcement of energy-related provisions of building codes;
- Provide overall coordination in drafting of a guidance materials for architects and construction engineers on meeting a high-efficiency standard in new building codes, containing methodology of design of energy-efficient buildings, calculation of energy consumption, demonstration of code compliance, and compilation of information for official documents certifying energy performance (Energy Passports).

2. Demand-side management : partnership with Turkmengas:

- Provide overall coordination in studying energy efficient potential of demand-side management in existing residential buildings and cost-effective, technical and achievable potential in all residential building stock;
- Oversee the first (before retrofitting) and second (after retrofitting) stages of energy audit and monitoring of selected pilot buildings and the development of energy audit methodology
- Ensure that the practical recommendations issued by the energy audit are introduced during the retrofitting works;
- Provide overall coordination in developing systems of energy certification and energy audit of buildings; record-keeping on energy efficiency of buildings; and energy management in the residential building stock of selected agencies;
- Provide overall coordination in drafting an Investment plan for reducing energy losses in the housing stock.

3. Improved design measures for major residential consumers:

- Oversee the process of design and construction of three new buildings and retrofitting of three existing buildings, following integrated building design approaches

4. Replication through partnership with other developers and support for policies that encourage energy efficiency:

- Review and provide recommendations on materials drafted for publishing in local and regional mass-media;

- Provide recommendations in formulating the findings and achievements of the project to be presented to national organizations for future replication and scaling-up;
- Provide overall guidance and support in introduction of new energy-efficiency requirements into the educational sector;
- Provide support in gathering materials for the development of protocols for energy efficient design/retrofits in the three most common prototype residential building designs;
- Ensure that design institutes and major housing developers are trained in and encouraged to incorporate energy efficiency protocols for the most common residential prototype designs;
- Ensure that recommendations from the project are incorporated into energy efficiency policies and programs.

Operational functions:

1. Periodic Review of Project Implementation and Advice on Improvement

- In-depth and regular discussions with project management in order to identify key technical problems (if any) and means for solving them;
- Undertake field trips to the project sites during each mission to Turkmenistan, if and when required, in order to make systematic review of the progress and results of each Component of the project based on field evidence;
- Participate, when feasible, in Project Board Meetings and other relevant project meetings;
- Assist in capturing the key lessons and developing a replication plan for other regions and communities in Turkmenistan. As part of the replication strategy, assist in developing replication materials for wider dissemination and application of project results and lessons learned;
- In cooperation with Project Team and UNDP CO, develop suitable next steps for each project component and project exit strategy.

2. Assistance in Planning, Staff Recruitment, Monitoring and Evaluation

- Provide support and advice for preparation or revision of key planning documents such as the project Annual Plan of Actions, Annual Work Plan, project progress reports, monitoring and review reports, GEF Project Implementation Reports (PIRs) etc.;
- Assist in the development of relevant Terms of References and mobilization of qualified international/national experts and organizations needed to provide specific consultancy services;
- Support the Low-Emission Programme Component Manager in the preparation and implementation of the Mid-term and Terminal Evaluation Missions (TORs, selection of appropriate candidates, accompany field missions (if and when required) and discussion with evaluators, etc.).

Outputs (1st period)

1. Analysis of accomplishments to date in each project component
2. Roadmap outlining strategy for next steps of implementation of each project component
3. Comments and recommendations on the project documents, thematic reports, and materials:
 - Draft of incentive program to design energy-efficiency buildings
 - Roadmap to organize the incentive program for designing energy efficiency buildings.
 - New/revised building energy efficiency codes
 - Guidance materials for architects and construction engineers on meeting a high-efficiency standard in new building codes
 - A comprehensive demand-side management study on energy efficiency potential in existing residential buildings
 - Energy audits in selected existing pilot buildings (before retrofitting)
 - Energy auditing methodology
 - Roadmap for introduction of mandatory energy audits and certification system of energy performance in buildings including situation analysis
 - Methodology for determining both baseline and enhanced energy performance of selected new buildings
 - Technical specifications for the building performance design and engineering in selected demonstration buildings
 - Methodology for determining both baseline energy and enhanced energy performance of buildings selected for retrofits based on energy audits

- Technical specifications for the design of the energy efficient buildings-retrofits, engineering, and implementation of specific energy-efficient features in selected demonstration buildings
4. Inputs and contribution in preparing project planning and implementation documents and reports:
- Terms of Reference for international/national consultants/organizations to be recruited in 2013
 - Annual Plan of Actions for 2013
 - Annual Work Plan for 2013
5. Written reports summarizing ICTA's participation in any missions or meetings undertaken during this assignment outlining:
- Mission objectives, goals and outputs
 - Brief assessment of results achieved during the meetings undertaken in Ashkhabad
 - Outline of next steps for the completion of assignment

IV. Deliverables and timeframe

The following deliverables and indicative schedule are expected from the consultancy contract. The final schedule will be agreed upon in the beginning of consultancy assignment.

#	Deliverables	Timeframe
1	Analysis of accomplishments to date in each project component	December 2012
2	Roadmap outlining strategy for next steps of implementation of each project component	December 2012
3	Comments and recommendations on the project documents, thematic reports, and materials (as specified under Outputs above)	February - April 2012
4	Inputs and contribution in preparation of project planning and implementation documents and reports (as specified under Outputs above)	December 2012
5	Written report summarizing ICTA's participation in any missions or meetings undertaken during the assignment (as specified under Outputs above)	November 2012

V. Payment Conditions

This is a lump sum contract that should include costs of consultancy and travel costs required to produce the above deliverables.

One mission to Ashkhabad for a total of 5 working days is envisaged.

Payment will be made in 3 installments according to these ToR after completion of Outputs and performance assessment by Low-emission Development Component Manager, as follows:

- 1st installment (20% of the total contract amount) to be made upon achievement of Deliverable 5
- 2nd installment (30% of the total contract amount) to be made upon achievement of Deliverables 1,2,4
- 3rd installment (50% of the total contract amount) to be made upon achievement of Deliverable 3

VI. Recruitment Qualification

Education:	Advanced degree (master's level, equivalent or higher) in the field of energy, environment, engineering, architecture or construction.
Experience:	At least 10-15 years of practical experience on energy efficiency policies and programs in the building sector; At least 7-10 years of practical experience in implementation and energy monitoring of energy-efficiency buildings; Working experience in developing countries and CIS countries is an asset.

**Language
Requirements:**

Proficiency in English, excellent analytical and presentation skills; good knowledge of written and spoken Russian.

Others:

Good understanding of local construction materials and practices.
Outstanding time-management, organizational and interpersonal skills.

TERMS OF REFERENCE

I. Position Information

Position Title:	International Consultant on Building Codes and Rating Systems
Type:	Individual Contract (IC)
Project Title:	Improving Energy Efficiency in the Residential Buildings Sector of Turkmenistan
Duration of the service:	30 working days in the period from April 2013 to December 2013
Duty station:	Home-based with one mission to Ashkhabad
Reports to:	Programme Specialist on Environment (overall supervision) and Low Emission Development Component Manager (direct supervision), UNDP Turkmenistan

II. Background Information

The objective of the UNDP/GEF project on improving energy efficiency in residential buildings in Turkmenistan is to reduce greenhouse gas emissions by improving energy management and reducing energy consumption in the residential sector in Turkmenistan.

The project has been designed to:

- strengthen building codes and associated normative documents on energy efficiency in buildings,
- develop capacity at Turkengas State Corporation and other state entities to identify end-use energy savings in their housing stock and implement investments to reduce end-use energy consumption,
- introduce improved highly-efficient design measures to major housing designers and developers, and
- replicate these measures through protocols for energy-saving measures in prototype buildings and through mainstreaming EE issues into state construction and housing policies and programs.

The project seeks to reduce energy consumption and associated greenhouse gases in residential sector in Turkmenistan and is structured into four project components:

5. Energy efficient building codes and supporting capacity strengthening
6. Demand-side management : partnership with Turkengas State Corporation
7. Improved design measures for major residential building designers and developers
8. Replication through partnership with other developers and support for policies that encourage energy efficiency

At present, neither new construction nor refurbishment projects consider the energy performance of the buildings involved. The buildings being constructed and refurbished now without any attention to energy efficiency are effectively “locking in” patterns of energy consumption – and associated greenhouse gas emissions -- for the next several decades at needlessly high levels. Even before the construction boom, emissions in the residential sector totaled more than 3 million tonnes of CO₂, or nearly 10% of total CO₂ emissions from fuel combustion. Now, these emissions play an increasing role in the overall share of greenhouse gas emissions in Turkmenistan, and the residential sector is the third largest source of emissions in the country. Without intervention, these emissions will continue to grow unchecked.

III. Functions / Key Outputs Expected

Under the overall supervision of the Programme Specialist on Environment and direct supervision of the Low-emission Development Component Manager, in close cooperation with International and Project Team Advisors and Consultants, the Building Codes and Rating Systems Consultant will be tasked with the following duties and responsibilities:

Energy-efficient building codes and supporting capacity strengthening:

- Review and provide recommendations on drafts of new and revised building codes developed by the Project Team: *Thermal Performance of Buildings, Residential Buildings, Roofs and Roofing*, and

Building Climatology, including checking of whole-building energy-efficiency performance requirements and associated calculation methodology. Analyze the proposed building codes and provide comparison with world best practices, with existing requirements in Turkmenistan, and with the goal of increasing energy efficiency in residential buildings by 15-25 percent.

- Provide information to the project team on existing energy passport systems (documentation and rating systems for energy performance of buildings) throughout the world.
- Based on information and preliminary analysis conducted by the Project Team, assess national conditions and provide recommendations on a proposed new energy passport system in Turkmenistan.
- Oversee the Project Team's development of a technical methodology for calculating and rating energy performance in residential buildings of Turkmenistan, taking account of world best practices and national conditions.
- Present recommendations on the need and applicability of a labeling system on energy performance for newly designed, renovated, and/or existing buildings in Turkmenistan, based on assessment of national conditions.
- Assist the Project Team in preparing and reviewing a report summarizing the review of world practice and providing recommendations with regard to the energy passport system and associated efforts in rating and labeling of buildings. Contribute to the development of the plan for 2014 activity with regard to documentation, rating, and labeling of buildings in terms of energy performance.
- Contribute to the development of an official design manual (code of practice) for architects and construction engineers on meeting new energy-efficiency requirements of building codes as well as guidance on how to exceed required energy performance levels (with a target of further 15-25% greater efficiency than code requirements).
- Contribute to the development of training modules and materials for architects, designers and construction engineers.
- Conduct introductory training sessions on energy-efficient building codes and energy passport systems.
- Contribute to the development of a brief report on the importance and expected benefits of new and revised building energy codes and energy passports for high-level government officials.

This work will be carried out via regular remote correspondence with the Project Team, plus one visit to Ashkhabad, covering one full work week.

Outputs:

- Recommendations presented for the drafts of new and revised building codes: *Thermal Performance of Buildings, Residential Buildings, Roofs and Roofing, and Building Climatology*.
- Summary information presented on existing energy passport systems throughout the world.
- Technical methodology elaborated for calculating and rating energy performance in residential buildings of Turkmenistan.
- Recommendations presented on applicability of a labeling system to newly designed, renovated and/or existing buildings in Turkmenistan.
- Recommendations presented on the plan for 2014 with regard to documentation, rating, and labeling of buildings in terms of energy performance.
- Recommendations presented on an official design manual (code of practice) on meeting and exceeding new energy-efficiency requirements of building codes.
- Training modules and materials on energy-efficient building codes and energy passport systems provided.
- Training sessions on energy-efficient building codes and energy passport systems for national experts conducted.
- Written report summarizing Consultant's participation in the mission to Ashkhabad undertaken during this assignment outlining:
 - Mission objectives, goals and outputs
 - Brief assessment of results achieved during the mission to Ashkhabad
 - Outline of next steps for the completion of assignment

IV. Deliverables and timeframe

The following deliverables and indicative schedule are expected from the consultancy contract. The final schedule will be agreed upon in the beginning of consultancy assignment. All deliverables should be submitted to UNDP by the Consultant in Russian or English.

#	Deliverables	Timeframe
1	Phase 1 deliverables	
	1.1. Recommendations for the draft of new and revised building codes: <i>Thermal Performance of Buildings, Residential Buildings, Roofs and Roofing</i>	July 2013
	1.2. Summary information on existing energy passport systems throughout the world	July 2013
	1.3. Training modules and materials on energy-efficient building codes and energy passport systems	August 2013
	1.4. Training sessions on energy-efficient building codes and energy passport systems for national experts	August-September 2013
	1.5. Written report summarizing Consultant's participation in the mission to Ashkhabad undertaken during this assignment	September 2013
2	Phase 2 deliverables	
	2.1. Technical methodology for calculating and rating energy performance in residential buildings of Turkmenistan	September-October 2013
	2.2. Recommendations on applicability of a labeling system to newly designed, renovated and/or existing buildings in Turkmenistan	September-October 2013
3	Phase 3 deliverables	
	3.1. Recommendations on the plan for 2014 with regard to documentation, rating, and labeling of buildings in terms of energy performance	November 2013
	3.2. Recommendations for the draft of new and revised building code: <i>Building Climatology</i>	November-December 2013
	3.2. Recommendations on an official design manual (code of practice) on meeting and exceeding new energy-efficient requirements of building codes	November-December 2013

V. Payment Conditions

This is a lump sum contract that should include costs of consultancy and travel costs required to produce the above deliverables. The final schedule will be agreed upon in the beginning of consultancy.

Payment will be released in three installments: 40% (Phase 1 deliverables), 30% (Phase 2 deliverables), and 30% (Phase 3 deliverables) upon timely submission of respective deliverables and their acceptance by the Programme Specialist on Environment.

VI. Competencies

- Wide familiarity with current best practices in energy-efficient building design, with regard to both heating and cooling as well as other relevant issues
- Proven experience in preparing and conducting training relevant to building codes and building rating systems
- Excellent organizational, analytic, communicative, time-management, and teamwork skills

VII. Qualification and competence requirements

Education:	Academic qualifications in building science and/or thermal engineering. The candidate shall also have knowledge of economics and/or policy regarding energy efficiency in buildings.
Experience:	At least 10 years of practical experience in development, assessment, and application of building codes and rating systems for energy efficiency Working experience in developing countries and CIS countries is an asset.
Language Requirements:	Proficiency in English, including excellent analytical and presentation skills. Skill in written and spoken Russian is strongly preferred.

VIII. Submission of applications

Methodology

All applicants shall submit a detailed methodology indicating phases, tasks, methods, techniques, time, resources, accessibility and tools to be applied for successful completion of assignment.

Financial proposal for implementation of the assignment

All applicants shall submit a detailed, carefully considered and justified financial statement based on a lump sum, which should include: a consultancy fee, administrative expenses (if applicable), travel expenses (if applicable), and/or any other expenses the applicants deem necessary to incur during assignment.

IX. Additional requirements for recommended contractor

Recommended contractors aged 62 and older, if the travel is required, shall undergo a full medical examination including x-ray, and obtain medical clearance from the UN-approved doctor prior to taking up their assignment. The medical examination is to be cleared by the UN physicians, and shall be paid by the consultant.

TERMS OF REFERENCE

I. Position Information

Position Title:	International Consultant on Energy-Efficient Building Design
Type:	Individual Contract (IC)
Project Title:	Improving Energy Efficiency in the Residential Buildings Sector of Turkmenistan
Duration of the service:	30 working days in the period from March 2013 to August 2013
Duty station:	Home-based with one mission to Ashkhabad
Reports to:	Programme Specialist on Environment (overall supervision) and Low Emission Development Component Manager (direct supervision), UNDP Turkmenistan

II. Background Information

The objective of the UNDP/GEF project on improving energy efficiency in residential buildings in Turkmenistan is to reduce greenhouse gas emissions by improving energy management and reducing energy consumption in the residential sector in Turkmenistan.

The project has been designed to:

- strengthen building codes and associated normative documents on energy efficiency in buildings,
- develop capacity at Turkmen State Corporation and other state entities to identify end-use energy savings in their housing stock and implement investments to reduce end-use energy consumption,
- introduce improved highly-efficient design measures to major housing designers and developers, and
- replicate these measures through protocols for energy-saving measures in prototype buildings and through mainstreaming EE issues into state construction and housing policies and programs.

The project seeks to reduce energy consumption and associated greenhouse gases in residential sector in Turkmenistan and is structured into four project components:

9. Energy efficient building codes and supporting capacity strengthening
10. Demand-side management : partnership with Turkmen State Corporation
11. Improved design measures for major residential building designers and developers
12. Replication through partnership with other developers and support for policies that encourage energy efficiency

At present, neither new construction nor refurbishment projects consider the energy performance of the buildings involved. The buildings being constructed and refurbished now without any attention to energy efficiency are effectively “locking in” patterns of energy consumption – and associated greenhouse gas emissions -- for the next several decades at needlessly high levels. Even before the construction boom, emissions in the residential sector totaled more than 3 million tonnes of CO₂, or nearly 10% of total CO₂ emissions from fuel combustion. Now, these emissions play an increasing role in the overall share of greenhouse gas emissions in Turkmenistan, and the residential sector is the third largest source of emissions in the country. Without intervention, these emissions will continue to grow unchecked.

III. Functions / Key Outputs Expected

Under the overall supervision of the Programme Specialist on Environment and direct supervision of the Low-emission Development Component Manager, in close cooperation with International and Project Team Advisors and Consultants, the International Consultant on Energy-Efficient Building Design will be tasked with the following duties and responsibilities:

- Participate in the drafting of technical specifications for three new residential buildings that will demonstrate energy-efficient design, materials, and equipment

- Participate as needed in planning the process for developing and confirming initial design and cost assessment for the three new demonstration buildings
- Review of energy audit data and assessment of potential energy-efficiency measures in existing buildings subject to retrofit, and in developing scenarios for various combinations of measures. This assessment will help the project team to devise a broad program of building energy retrofits, to be developed in 2014 as a demand-side management program. The audits, begun in 2012 and to be completed in 2013, will also serve the more specific purpose of providing a basis for design of three demonstration renovation projects (see output immediately below)
- Participate in the development of design and planning of the renovations of three existing buildings in order to demonstrate cost-effective energy-efficiency upgrades
- Participate in development of the designs for the three new demonstration buildings based on the technical specifications, with the goal of maximizing energy efficiency and reflecting world best practices to the extent possible within technical, market, and budgetary constraints
- Development of training modules and materials on energy-efficient building design for university students and professionals
- Delivery of training to building designers in Turkmenistan on energy-efficient building design

This work will be carried out via regular remote correspondence with the Project Team, plus one visit to Ashkhabad, covering one full work week.

Outputs:

- Written recommendations presented regarding technical specifications and initial design and cost assessment process for three new residential buildings
- Written discussion presented on feasible and recommended measures for a program of retrofit of existing residential buildings in Turkmenistan, based on results of energy audits completed by the Project Team.
- Written recommendations presented on the design and planning of the renovations of three existing buildings, including design details and justification of chosen energy-efficiency measures
- Written recommendations presented on the designs for the three new demonstration buildings, including design details and justification of chosen energy-efficiency measures
- Training modules and materials delivered on energy-efficient building design for university students and professionals
- Training sessions delivered to building designers in Turkmenistan on energy-efficient building design
- Written report summarizing Consultant's participation in the mission to Ashkhabad undertaken during this assignment outlining:
 - Mission objectives, goals and outputs
 - Brief assessment of results achieved during the mission to Ashkhabad
 - Outline of next steps for the completion of assignment

IV. Deliverables and timeframe

The following deliverables and indicative schedule are expected from the consultancy contract. The final schedule will be agreed upon in the beginning of consultancy assignment. All deliverables should be submitted to UNDP by the Consultant in Russian or English.

#	Deliverables	Timeframe
1	Phase 1 deliverables	
	1.1. Written recommendations presented regarding technical specifications and initial design and cost assessment process for three new residential buildings	March-April 2013
	1.2. Written discussion presented on feasible and recommended measures for a program of retrofit of existing residential buildings in Turkmenistan, based on results of energy audits	March-April 2013
2	Phase 2 deliverables	

2.1. Written recommendations presented on the design and planning of the renovations of the three existing buildings, including design details and justification of chosen energy-efficiency measures	April-May 2013
2.2. Written recommendations presented on the designs for the three new demonstration buildings and justification of chosen energy-efficiency measures	May-June 2013
2.3. Training modules and materials delivered on energy-efficient building design	June-July 2013
2.4. Training sessions delivered in Turkmenistan on energy-efficient building design	June-July 2013
2.5. Written report summarizing Consultant's participation in the mission to Ashkhabad undertaken during this assignment outlining: - Mission objectives, goals and outputs - Brief assessment of results achieved during the mission to Ashkhabad - Outline of next steps for the completion of assignment	July-August 2013

V. Payment Conditions

This is a lump sum contract that should include costs of consultancy and travel costs required to produce the above deliverables. The final schedule will be agreed upon in the beginning of consultancy.

Payment will be released in two installments: 20% (Phase 1 deliverables) and 80% (Phase 2 deliverables) upon timely submission of respective deliverables and their acceptance by the Programme Specialist on Environment.

VI. Competencies

- Wide familiarity with current best practices in energy-efficient building design, with regard to both heating and cooling as well as other relevant issues
- Proven experience in preparing and conducting training relevant to energy-efficient integrated building design
- Excellent organizational, analytic, communicative, time-management, and teamwork skills

VII. Qualification and competence requirements

Education:	Academic qualifications in building science and/or thermal engineering.
Experience:	At least 10 years of practical experience in design of energy-efficient residential buildings. Close working familiarity with international best practice in design of building envelopes and HVAC systems. Technical expertise in thermal engineering, and energy performance modeling in buildings. Working experience in developing countries and CIS countries is an asset.
Language Requirements:	Proficiency in English, including excellent analytical and presentation skills. Skill in written and spoken Russian is strongly preferred.

VIII. Submission of applications

Methodology

All applicants shall submit a detailed methodology indicating phases, tasks, methods, techniques, time, resources, accessibility and tools to be applied for successful completion of assignment.

Financial proposal for implementation of the assignment

All applicants shall submit a detailed, carefully considered and justified financial statement based on a lump sum, which should include: a consultancy fee, administrative expenses (if applicable), travel expenses (if applicable), and/or any other expenses the applicants deem necessary to incur during assignment.

IX. Additional requirements for recommended contractor

Recommended contractors aged 62 and older, if the travel is required, shall undergo a full medical examination including x-ray, and obtain medical clearance from the UN-approved doctor prior to taking up their assignment. The medical examination is to be cleared by the UN physicians, and shall be paid by the consultant.

Annex 5. List of participants at the Inception Workshop

Minutes and recommendations of the project board, methodology



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List of participants, January 30, 2012

Inception Workshop for UNDP-GEF EE Buildings, UNDP-GEF Regional Project Team meeting

	Name	Organization	Title	Contact Information
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Annex 6. Minutes and List of Participants of the Joint Meeting of the Project Board and Advisory Board

InRussian

Отчёт о проведении рабочей встречи по проекту ПРООН «Улучшение энергоэффективности в секторе жилищного строительства Туркменистана»

В актовом зале отеля «Ак Алтын» 11 мая 2012 года состоялась рабочая встреча по проекту ПРООН «Улучшение энергоэффективности в секторе жилищного строительства Туркменистана». В ней приняло участие более 20 специалистов в области обучения, проектирования, строительства и эксплуатации жилых домов, а также представители от: Меджлиса, Министерства экономического развития, Министерства охраны природы, Института стратегического планирования и экономического развития и ПРООН.

Встречу открыл Программный специалист по вопросам охраны окружающей среды ПРООН Туркменистана Ровшан Нурмухамедов. Он ознакомил присутствующих с повесткой дня рабочей встречи (прилагается), организовал представление участников встречи и рассказал о цели и задачах встречи. Как отметил Ровшан Нурмухамедов – основными, на данной встрече являются три задачи:

- Создание Комитета Управления Проекта;
- Создание Экспертного Консультативного Совета;
- Утверждение плана на 2012 год.

В Комитет Управления Проекта предлагается включить основных исполнителей проекта, это Хякимлик г. Ашхабада, Министерство коммунального хозяйства, Министерство строительства, Министерство энергетики и промышленности, Министерство охраны природы, ПРООН и главный бенефициар концерн «Туркменгаз» - руководитель Комитета. Комитет будет обеспечивать координацию с другими заинтересованными сторонами проекта, согласовывать и при необходимости корректировать годовые планы, вести контроль их исполнения. Предлагается собирать Комитет Управления Проекта не реже 2-х раз в год. Данное предложение было одобрено участниками встречи.

О целях и задачах, структуре реализации и управления проектом «Улучшение энергоэффективности в секторе жилищного строительства Туркменистана» рассказала Менеджер программы по низкоуглеродному развитию ПРООН Ирина Атамурадова. Она рассказала: о впечатляющих размерах нового строительства жилья в Ашхабаде, начата реконструкция существующих зданий, энергия является бесплатной для жителей, нет акцента на энергоэффективности в реконструкции зданий, отсутствие осведомленности и опыта в области энергоэффективности. Целью проекта является сокращение выбросов ПГ через улучшение управления энергией и сокращение потребления энергии в жилом секторе. В результате выполнения проекта должна быть достигнута ежегодная экономия газа в размере 5 133 тысяч кубометров. Прямое сокращение выбросов за 20 летний срок службы новых и реконструированных домов составит 202 866 tCO₂e. Проект состоит из 4-х компонентов:

КОМПОНЕНТ 1: Усиление энергоэффективных строительных норм и вспомогательного потенциала;

КОМПОНЕНТ 2: Партнерство в управлении со стороны потребления с «Туркменгазом»;

КОМПОНЕНТ 3: Меры по улучшенному проектированию для жилых домов;
КОМПОНЕНТ 4: Тиражирование посредством сотрудничества с другими застройщиками и содействие реформам домостроения, поощряющим эффективность использования энергии.

Срок реализации проекта составляет 4 года: 2011 – 2015 года.

Бюджет проекта 46,2 млн. долларов США, в том числе: ГЭФ - 2.5 млн. Дол. США; ПРООН - 0.3 млн. Дол. США; «Туркменгаз» - 19,9млн. Дол. США; Город Ашхабад - 17.5 млн. Дол. США; Министерство строительства - 6.0 млн. Дол. США.

Основными рисками Проекта являются:

- Отсутствие решения со стороны государства пересмотреть и принять более жесткие строительные нормы и правила касательно эффективности энергии;
- Слабые стимулы для жилищных застройщиков внедрять более эффективные проекты и предпринимать меры по экономии энергии.

О рабочих планах проекта «Улучшение эффективности использования энергии в секторе жилищного строительства Туркменистана» рассказал Технический консультант проекта Вадим Шмидт. При презентации 4-х летнего плана он остановился на основных мероприятиях, которые предстоит выполнить за 4-е года и о результатах которые будут достигнуты при выполнении проекта.

Более подробно Вадим Шмидт остановился на годовом рабочем плане проекта.

В компоненте 1 - будет разработана и согласована с заинтересованными организациями Программа стимулирования для проектирования энергоэффективных домов. Будут начаты работы по пересмотру СНТ, разработке инструкции, которая конкретизирует обязанности ответственных сторон по вопросу реализации энергетических паспортов и инструктивных материалов для архитекторов и инженеров-строителей по соблюдению энергоэффективных нормативных документов.

В компоненте 2 - будут определены три типа домов, подлежащих реконструкции установлено оборудование, необходимое для контроля энергии в жилых домах и будет проведено исследование по потенциалу эффективного использования энергии со стороны потребления и детальный энергетический аудит.

В компоненте 3 - будут определены участки под строительство новых жилых домов и три многоквартирных жилых дома, подлежащих реконструкции. Будет выполнен сбор данных для проектных требований и осуществлена разработка технических требований для проектирования новых энергосберегающих жилых домов и выполнения энергоэффективной реконструкции. Так же в 4 квартале начнется разработка модели энергетического паспорта.

В компоненте 4 - предусматривается проведение международной стажировки – для ознакомления с существующей лучшей практикой энергоэффективного домостроения, обновление регионального веб-сайта проекта и размещению на нем отчетов по новым СНТ и потенциалу эффективного использования энергии со стороны потребления.

Вопросы и ответы:

Бегмурад Бабаев – Какая должность должна быть у лиц, назначаемых в Комитет Управления Проекта?

Ровшан Нурмухамедов – Желательно на уровне начальника управления, но данный вопрос решает руководитель организации, являющейся членом Комитета Управления Проекта.

Максат Бабаев – Разработаны ли мероприятия по энергоэффективности, которые будут применяться в проекте?

Вадим Шмидт – Эти мероприятия будут определены не раньше декабря, после проведения исследования по потенциалу эффективного использования энергии со стороны потребления и детального энергетического аудита.

Максат Бабаев – В скором времени для концерна «Туркменгаз» будет реализовываться пилотный проект одноэтажного дома площадью 120 квадратных метров. Хотелось бы включить в него требования по энергоэффективности.

Вадим Шмидт – Мы можем подготовить перечень мер по энергоэффективности для данного пилотного проекта.

После Кофе – брейка Ирина Атамурадова спросила участников встречи, можно ли считать присутствующих на встрече представителей министерств и ведомств членами Комитета Управления Проекта и Экспертного Консультативного Совета. На что последовал отрицательный ответ. Поэтому принято решение одобрить состав Комитета Управления Проекта, Экспертного Консультативного Совета и рабочей группы для разработки программы стимулирования повышения энергоэффективности в зданиях. Министерства и ведомства письменно представят в ПРООН членов Комитета Управления Проекта и Экспертного Консультативного Совета.

Далее были обсуждены и одобрены методы сотрудничества и партнерские взаимоотношения (прилагаются).

В заключительных обсуждениях Ирина Атамурадова сделала акцент на наборе команды проекта. Она отметила, что технические задания для трех специалистов, которые будут работать в проекте на долгосрочной основе, подготовлены и конкурс в ближайшие дни будет объявлен. Ирина Атамурадова обратилась с просьбой к участникам встречи оказать содействие в подборе и направлении специалистов для участия в конкурсе. После обсуждения Рекомендации и заключения рабочей встречи (прилагаются) были одобрены.

В заключение Ирина Атамурадова поблагодарила всех за активное участие в рабочей встрече и выразила надежду на дальнейшее плодотворное сотрудничество.

Рекомендации и заключения
Рабочей встречи по проекту
«Улучшение энергоэффективности в секторе жилищного строительства
Туркменистана»
11 мая 2012 года

- I. Просить Министерство строительства, Министерство коммунального хозяйства, Министерство энергетики и промышленности, концерн «Туркменгаз», Хякимлик г. Ашхабада и Министерство охраны природы представить в ПРООН письмо о назначении лиц в Комитет Управления Проекта.
- II. Просить Меджлис, Министерство экономики и развития, Министерство строительства, Министерство коммунального хозяйства, Министерство энергетики и промышленности, Министерство промышленности строительных материалов, концерн «Туркменгаз», Хякимлик г. Ашхабада, концерн «Туркменнебитгазгурлушик», АОЗТ «Нефтегазхызмат» Институт стратегического планирования и экономического развития и Туркменский Политехнический институту представить в ПРООН письмо о назначении лиц в Экспертный Консультативный Совет согласно списку, прилагаемому к письму ПРООН №321 от 26.04.2012.
- III. Установить, что Комитет Управления Проекта должен собираться не реже 2-х раз в год, а Экспертный Консультативный Совет по мере необходимости.
- IV. Просить концерн «Туркменгаз», Министерство энергетики и промышленности и Министерство коммунального хозяйства представить в ПРООН письмо о приобретении, установке приборов учета и осуществлении мониторинга и энергоаудита.
- V. Принять к сведению, что материалы для объявления конкурса на прием на работу на долгосрочной основе (4года) трех специалистов (Специалиста по строительным нормативным документам; Специалиста по строительству жилых зданий и Специалиста по энергетическому аудиту) подготовлены, и конкурс в ближайшие дни будет объявлен.
- VI. Просить участников встречи содействовать в подборе и направлении специалистов для участия в конкурсе.
- VII. Просить концерн «Туркменгаз» ежегодно согласовывать с Кабинетом министров Туркменистана годовой график проведения встреч, тренингов и семинаров по проекту «Улучшение эффективности использования энергии в секторе жилищного строительства Туркменистана». График встреч, тренингов и семинаров будет разрабатываться ежегодно командой проекта при координации «Туркменгаза».
- VIII. Годовой план проекта на 2012 год рассмотрен, комментарии учтены. Рекомендовать концерну «Туркменгаз» и ПРООН одобрить представленный план на 2012 год.
- IX. Команде проекта оказать помощь концерну «Туркменгаз» в подготовке перечня мер по энергоэффективности для пилотного проекта одноэтажного дома площадью 120 квадратных метров.

**Список участников
Рабочей встречи по проекту ПРООН
«Улучшение энергоэффективности в секторе жилищного
строительства Туркменистана»**

11 мая 2012, Ашхабат, отель «Ак Алтын»

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Annex 7. Project vehicle purchase justification

Project activities are extended to 6 project pilot sites (3 new buildings and 3 retrofits) located in different parts of Ashgabat. Frequent travels are therefore expected for about 12 working days per month. As the project is 5 years long in lifetime, procurement of a dedicated 4x4 vehicle for project needs is a reasonable and cost effective measure.

Below is a feasibility study with a comparative cost effectiveness calculation related to transportation services.

Existing two transportation modalities are compared:

1. Rent of full transportation services at fixed daily rate. All related expenses are borne by driver: driving services, personal car, gasoline, daily maintenance.
2. Purchase of the project car. Related expenses are purchase of 4x4 vehicle, monthly salary payment for driver, gasoline and regular maintenance expenses.

Option 1:

Current CO Turkmenistan rent rate for 4x4 vehicle is \$68.00 per day. Given the project life span over 5 years period, the total expenses for transportation services will stand at \$48,960.00.

(It should be noted that the current transportation rate was established in 2008, and will undergo revision in near future. That will make the transportation expenses higher).

Another 12 working days the 4x4 is used for driving services within Ashgabat for daily routine businesses under the project and is rented at the same standard \$68.00 per day. The total expenses for this type of services at project end are therefore \$48,960.00.

Thus, the total expenses for all transportation services (24 working days) stand at \$1,632.00 per month, or \$19,584.00 per year, or \$97,920.00 at end of 5 years project cycle.

Option 2:

Purchase of a new 4x4 vehicle would cost the project at average of \$30,000.00. Monthly payment for driver will be \$500.00 per month or \$30,000.00 by the end of the project. The gasoline and car daily maintenance expenses stand at \$60.00 per month or \$3,600.00 at project end.

The total expenses for the second option will cost the project over its life-span \$63,600.00.

In view of abovementioned calculations the second option would save \$34,320.00 of project money.

There are also several advantages of the second option: new car is safer and has lower risk of unexpected breakage compared with a car which is already in use in the first option. UNDP would hold ownership of the car for the duration of project and thus would enjoy diplomatic immunity. At the end of the project the car will be transferred to the beneficiary.