



**Policy Reforms and Market Transformation of the Energy Efficient  
Buildings Sector of the I.R. Iran  
(EEEB Project)**

UNDP/GEF Project

GEF ID No: 5182

UNDP PIMS No: 4018

**TERMINAL EVALUATION REPORT**

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## **Acronyms and Abbreviations**

APPR	Annual Project Progress Report
BHRC	Building and Housing Research Center
BEMS	Building Energy Management Systems
CTA	Chief Technical Adviser
CEEE	Committee for Energy Efficiency and Environment
CO	Country Office
CSSAP	Cross-Sectoral Strategy and Action Plan
DoE	Department of Environment
DNPM	Deputy National Project Manager
EEM	EE Market
EE	Energy Efficiency
EEEM	Energy Efficiency and Environment Market
EEEB	Energy Efficient Buildings
EMIS	Energy Management Information System
GEF	Global Environment Facility
GHG	Greenhouse Gas
IFCO	Iran Energy Conservation Company
INSO	Iran National Standard Organization
MPO	Management and Planning Organisation
M&E	Monitoring and Evaluation
Mt	Megatonne
MTR	Mid-term Review
MCLS	Ministry of Cooperatives, Labour, and Social Welfare
MFA	Ministry of Foreign Affairs
MRV	Monitoring, Reporting and Verification
NPD	National Project Director
NPM	National Project Manager
PBO	Planning and Budgeting Organization
Pro Doc	Project Document
PIR	Project Implementation Report
SATBA	Renewable Energy and Energy Efficiency in Electricity
RES	Renewable Energy Sources
SDG	Sustainable Development Goals
TE	Terminal Evaluation
ToR	Terms of Reference
UNDP	United Nations Development Programme
VPST	Vice Presidency for Science and Technology



## Glossary of Evaluation-related Terms

Term	Definition
Baseline data	Data that describe the situation to be addressed by an intervention and serve as the starting point for measuring the performance of the intervention
Beneficiaries	The specific individuals or organizations for whose benefit an intervention is undertaken
Capacity development	The process by which individuals, organizations, institutions and societies develop their abilities individually and collectively to perform functions, solve problems and set and achieve objectives
Conclusion	A reasoned judgement based on a synthesis of empirical findings or factual statements corresponding to a specific circumstance
Effect	Intended or unintended change due directly or indirectly to an intervention
Effectiveness	The extent to which the development intervention's objectives were achieved, or are expected to be achieved
Efficiency	A measure of how economically resources/inputs (funds, expertise, time, etc.) are converted to results
Finding	A factual statement about the programme or project based on empirical evidence gathered through monitoring and evaluation activities
Impact	Positive and negative, intended and non-intended, directly and indirectly, long term effects produced by a development intervention
Indicator	Quantitative or qualitative factors that provide a means to measure the changes caused by an intervention
Lessons learned	Generalizations based on evaluation experiences that abstract from the specific circumstances to broader situations
Logframe (logical framework approach)	Management tool used to facilitate the planning, implementation and evaluation of an intervention. It involves identifying strategic elements (activities, outputs, outcome, impact) and their causal relationships, indicators, and assumptions that may affect success or failure. Based on RBM (results-based management) principles
Outcome	The likely or achieved (short-term and/or medium-term) effects of an intervention's outputs
Output	The product, capital goods and/or service which results from an intervention; may also include a change resulting from the intervention which is relevant to the achievement of an outcome
Rating	An instrument for forming and validating a judgement on the relevance, performance and success of a programme or project through the use of a scale with numeric, alphabetic and/or descriptive codes
Recommendation	A proposal for action to be taken in a specific circumstance, including the parties responsible for that action
Relevance	The extent to which the objectives of an intervention are consistent with beneficiaries' requirements, country needs, global priorities and partners' and donor's policies
Risk	Factor, normally outside the scope of an intervention, which may affect the achievement of an intervention's objectives
Sustainability	The continuation of benefits from an intervention, after the development assistance has been completed
Stakeholders	The specific individuals or organizations that have a role and interest in the objectives and implementation of a programme or project
Theory of Change	A set of assumptions, risks and external factors that describes how and why an intervention is intended to work.



## **Acknowledgement**

Authors of this Terminal Evaluation report wish to express their appreciation to all stakeholders of the EEEB project whom they interviewed during the data collection phase for their time devoted to the interviews, their open views on implementation of the project and their candid opinions on the achieved results.

Special thanks are extended to the staff of the UNDP Country Office in the I.R. of Iran and the Project Team for timely provision of all requested information and assistance with organization of the virtual interviews, as well as for effective arrangements for the field visit to selected pilot projects by the National Consultant.

The excellent cooperation of all parties enabled the evaluators to obtain as much as possible of first-hand information from various project partners and together with data extracted from the project documentation and various complementary information sources allowed to provide an objective assessment of the status of the project results and thus contributed to successful completion of the Terminal Evaluation.



## EXECUTIVE SUMMARY

### Project Information Table

<b>Project Title</b>	Policy Reforms and Market Transformation of the Energy Efficient Buildings Sector of the I.R. Iran		
<b>UNDP Project ID (PIMS #):</b>	4018	<b>PIF Approval Date</b>	8 June 2010
<b>GEF Project ID (PMIS #):</b>	5182	<b>CEO Endorsement Date:</b>	11 June 2012
<b>ATLAS Business Unit, Award # Proj. ID:</b>		<b>Project Document (ProDoc) Signature Date (date project began):</b>	18 August 2016
<b>Country(ies):</b>	Iran	<b>Date project manager hired:</b>	
<b>Region:</b>		<b>Inception Workshop date:</b>	
<b>Focal Area:</b>	Climate Change – GEF 4 Climate Change Mitigation - GEF-5	<b>Midterm Review completion date:</b>	October 2019
<b>GEF Focal Area Strategic Objective:</b>	GEF-4 Objective 1: Promote energy-efficient technologies and practices in appliances and buildings,  GEF-5 Objective 2: Promote market transformation for energy efficiency in industry and the building sector	<b>Planned closing date:</b>	18 August 2021
<b>Trust Fund [indicate GEF TF, LDCE, SCCF, NPIF]:</b>	GEF TF	<b>If revised, proposed op. closing date:</b>	18 February 2022
<b>Executing Agency/Implementing Partner:</b>	Vice Presidency for Science and Technology (VPST) – Committee for Energy Efficiency and Environment (CEEE)		
<b>Other execution partners:</b>			
<b>Project Financing</b>	<b><i>at CEO endorsement (US\$)</i></b>	<b><i>At Terminal Evaluation (US\$)</i></b>	
<b>GEF financing:</b>	4,000,000	3,077,199.53	
<b>UNDP contribution</b>	125,000	171,793	
<b>Government</b>	28,391,760	37,843,856	
<b>Other partners</b>	-	3,629,355	
<b>Total co-financing</b>	28,516,760	41,645,004	
<b>PROJECT TOTAL COSTS</b>	<b>32,516,760</b>	<b>44,722,203.53</b>	



## **Project Description**

The EEEB project was approved as a 4-year full-size GEF-4 project. The signature of the Project Document by the Government of Iran on 18 August 2016 officially marked the start of the project implementation. The original project completion date was 18 August 2020. The project duration was extended by 18 months, including 6-month extension as a result of COVID-19 impact thus the revised completion date was 18 February 2022.

The goal of the EEEB project was the reduction of greenhouse gas emissions in the building sector in Iran, through the transformation of market, facilitated by removing barriers for the implementation of heating system improvements and encouraging retrofitting in existing buildings and mitigating future emissions by setting standards for new buildings.

The objective of the project was to achieve GHG emission reduction in Iran's buildings sector through legislative, policy and regulatory reforms and implementation of cost-effective mitigation measures as well as increasing the share of solar water heating to meet the energy requirements of new buildings and the existing stock. Implementation of policies on energy efficiency and developing appropriate means of applying building energy codes are among the interventions of the present project that would lead to reduced GHG emissions. It was envisaged to achieve this objective by (i) reviewing the legislative, policy and regulatory frameworks that impact building efficiency in Iran; (ii) revisiting the building code and products standards and labels and developing a supportive cross-sectoral energy efficiency strategy; (iii) piloting installations of energy efficient and renewable energy measures in existing buildings; and (iv) transforming the market by training manufacturers and building professionals to produce and install energy efficient heating systems, and developing a stakeholder awareness-raising campaign and developing proposals for financing mechanisms for households.

## **Summary of project results**

Component 1: The EEEB project assistance was important for timely revision of the relevant regulatory instruments on building energy efficiency, namely the 4<sup>th</sup> revision of the National Building Code Article 19 and revision of two building energy standards for existing buildings. As the project provided additional financing for the restricted national budget, it thus enabled a more thorough revision of the regulatory instruments. In comparison with the previous revision that comprised two building design methods, the actual revision, comprises 4 different design methods that, amongst other things, changed the rules about design of the building envelope, through definition of optimum values cleared the previous ambiguity of the design of windows, and put more focus on energy consumption in the buildings.

Despite the ambitious objectives of the revised Article 19, the building construction industry delivers a majority of new building in the lowest (EC) rating category that ensures compliance with the revised Article 19. This is a combined effect of persisting subsidies on energy prices and insufficient financial incentives for construction of higher level (EC+ and EC++) buildings.

Furthermore, the EEEB project supported necessary institutional arrangements for effective energy monitoring through a national platform of integrated building data monitoring and



building energy identification system (EMIS-BEID). Operationalisation of the Energy Management Information System (EMIS) platform marks the the first time a digitalized platform has been developed and made available to the Government of Iran for monitoring of energy consumption and efficiency in the building sector. It is expected that the EMIS platform will play a key role as a digitalized infrastructure for a full functionality of the energy efficiency market.

Despite the successful launching, operation of the BEID/EMIS platform was at a piloting stage at the time of the TE as it covers only a few hundreds of buildings under the auspices of the Tehran Municipality. The functioning is facing two major challenges. Firstly, replication and upscaling of EMIS to other municipalities will require substantive investment into hardware in terms of servers, connection lines, etc. Secondly, it will also require on-line uploading data about gas and electricity consumption in buildings that are in possession of organisations belonging to the Ministry of Petroleum and the Ministry of Power.

The project sponsored elaboration of studies on legal and regulatory framework for establishment of energy efficiency and environment market (EEEM) that provided a general guidance for development of required regulatory, legal, and financial frameworks and models as well as for executing instructions for establishment and implementation of the EEEM in the form of Energy Performance Contracts.

Component 2: Energy efficiency pilot projects were implemented in 541 pilot buildings including 362 residential building with 3,000,000 m<sup>2</sup> and 179 non-residential buildings with 723,000 m<sup>2</sup>. The deployment of energy efficiency measures across 362 residential pilot buildings resulted in estimated annual energy savings of 3,770,150 Nm<sup>3</sup> natural gas and 4,040,470 kWh electricity. The amount of saved energy resulting from the 179 non-residential buildings were 3,608,500 (Nm<sup>3</sup>) and 9,063,475 (kWh), respectively. There is a potential for even higher savings in governmental building pilots that could be realised through further developing the capacity of governmental staff and deploying different EE measurements for permanent and temporary spaces in the buildings.

The project supported conduct of Investment Grade Energy Audits (IGEA) in 10 demonstration buildings with the aim to identify and calculate cost-benefit of applicable EE and RE measures and technologies with focus on deeper and more innovative measures based on EE market in Iran. This work resulted in selection and deployment of 14 specific types of EE and RE technologies throughout the pilot projects.

Due to the limited budget and time, the EEEB project decided to deploy the above EE and RE measurements which at the maximum saved energy about 25 % and identified a potential for supporting start-up companies for developing the ideas on more effective EE/RE measures. The pilots were implemented with the ESCOs that identified more effective EE and RE solutions but could not deploy these technologies as their contracts with EEEB project included only selected EE and RE technologies and were thus inflexible. On the other hand, the upfront cost for deployment of EE/RE technologies was found to be an issue especially for the residential building owners who cannot afford to pay these costs. Also, building developers reported that



construction of lower energy buildings (EC+, EC++ and Near Zero buildings) requires much more investment and hence is currently not profitable.

The activities under this project component resulted in development and practical implementation of two ESCO business models, namely guarantee-based and shared-based models for energy service performance contracting, as well as formation of an energy efficiency supply chain for the 14 applicable and feasible technologies. These are key requirements for energy efficiency market development, and it is expected that the practical experience gained under the pilot projects will facilitate further adoption, promotion and scaling-up of these technological measures.

Component 3: This part of the project delivered a number of training and capacity building activities for various project stakeholders towards ensuring the compliance with the revised Building Code and energy labelling standards. Due to outbreak of COVID-19 and imposition of related meeting energy efficiency training workshop restrictions, nearly all training and awareness raising activities had to be transferred to the virtual (on-line) modality. Although in the beginning the project staff, trainers and trainees were not familiar with the new modalities, they in the end enabled covering higher number of trainees from all over the country in comparison to the original plans of physical training events.

One of the main obstacles to a systematic enforcement of compliance with the revised Article 19 and the building energy labelling standards are insufficient human capacities for construction and inspection of newly constructed buildings. Under Component 3, the EEEB project provided a train-the-trainers programme for a pool of master trainers and initial cascading down of the training to a group composed of several hundred civil engineers from the ICEO and municipalities. Given the size of the target group (the number of CEO members estimated at about 500,000 in all provinces), this is just a starting point and continued effort will be needed to train more civil engineers, builders, and municipality inspectors so that they can effectively implement the energy efficiency regulations throughout the country.

Establishment of the energy efficiency centre at the Shahid Soha centre of the Technical and Vocational Training Organization (TVTO) was a very important step as the latter organisation plays a complementary role to the universities in terms of building national experience with use of equipment for building energy efficiency. However, the centre was officially inaugurated only at the very end of the project period so the real impact on training of energy efficiency professionals remains to be seen.

### **Sustainability and progress to impact**

The established and operational national BEID platform is the most direct and immediate impact of the EEEB project. Its first part, called the Energy Approach Evaluation System (EAES) enables monitoring of new buildings under construction from the start of design until the end of construction and allows investors, designers and supervisors to ensure that building design patterns and used methods of construction of buildings are in compliance with the requirements of Code 19 of the National Building Regulations. Based on the data entered in the system, the EAES provides results of the design and construction evaluation and issues related



reports required for issuance of relevant certificates and obtaining necessary permits from legal entities. Furthermore, the system also provides checklists for use by the supervising engineers of construction projects to detect non-compliance with the Code 19 requirements.

The second part of the BEID platform (EMIS) enables calculation of the energy efficiency indices by monitoring the energy consumption of buildings based on the national standards 14253 and 14254 for labelling building energy performance. The system also presents information about potentials for energy savings and improving energy efficiency indicators, as well as the impact of implementation of energy saving measures in the buildings. Finally, the EMIS also identifies the energy baseline and potential to reduce greenhouse gas emissions for building owners.

The system for measuring and independent verification of energy savings in the building sector developed with the project support enables collection and flow of information to the domestic platform for Monitoring, Reporting and Verification (MRV) and has direct impact on provision reporting under the UNFCCC.

Implementation of the pilot projects had also direct impact on jobs in the participating ESCOs. The results from the pilot projects demonstrated the potential for achievement of energy savings through installation of various energy efficiency measures. However, progress towards long-term impacts in terms of replication and eventual upscaling of the pilot projects depends on the payback period for energy efficiency investments. As currently the energy prices in Iran are heavily subsidised, the payback periods for EE investments significantly exceed the horizon of 3-5 years and therefore such investments are not attractive for investors and building owners. Therefore, any replication and upscaling of the pilot activities even in private buildings will not be possible without governmental subsidies for implementation of EE measures that can be further enhanced through the EE Market.

The support of the EEEB project to collection of data on energy consumption in the building sector has contributed to ongoing efforts to convince public and private investors and bring their attention to EE opportunities through quantification and highlighting of the multiple and diverse benefits of EE investments. In the past, the necessary data was either not available or stored in different departments of governmental and municipal entities. Therefore, by consolidating the data and making them available in the on-line platform the project contributed to more exact documentation of the building stock and paved the way to performing analysis and substantial reporting, as well as integration of EE measures in national planning and budgeting schemes.

Overall, the likelihood of a long-term impact of the project will depend on removal of energy subsidies as one of the main barriers preventing full realization of gains from energy efficiency measures in all sectors. Although the GoI has instituted a series of policy and regulatory interventions on energy efficiency to accompany the reform, implementation of these measures has not reached its full potential.



## Summary of TE ratings

<b>Monitoring &amp; Evaluation (M&amp;E)</b>	<b>Rating</b>
Monitoring and evaluation: design at entry	Satisfactory (S)
Monitoring and evaluation: implementation	Satisfactory (S)
Overall quality of monitoring and evaluation	Satisfactory (S)
<b>Implementing Agency (IA) Implementation &amp; Executing Agency (EA) Execution</b>	<b>Rating</b>
Quality of UNDP Implementation/Oversight	Satisfactory (S)
Quality of Implementing Partner Execution	Moderately Satisfactory (MS)
Overall quality of Implementation/Execution	Moderately Satisfactory (MS)
<b>Assessment of Outcomes</b>	<b>Rating</b>
Relevance	Relevant (R)
Effectiveness	Moderately Satisfactory (MS)
Efficiency	Moderately Satisfactory (MS)
Overall Project Outcome Rating	Moderately Satisfactory (MS)
<b>Sustainability</b>	<b>Rating</b>
Overall likelihood of sustainability	Moderately Likely (ML)
Financial resources	Moderately Likely (ML)
Socio-political	Moderately Likely (ML)
Institutional framework and governance	Likely (L)
Environmental	Likely (L)



### Summary of recommendations

No.	TE Recommendation	Responsible	Time Frame
1.	The Government of Iran should consider institutionalisation of the EEEB Project Steering Committee and its continued functioning after the operational closure of the project	Government	Immediately
2.	The Government of Iran and the Tehran Municipality should ensure necessary human and financial resources are provided for enforcement of the revised Article 19 and building labelling standards	Government, Tehran Municipality	Immediately
3.	UNDP CO should assist the GoI to identify multilateral and/or bilateral funding sources to finance provision of further international expertise on implementation of technologies for energy efficiency in buildings	UNDP CO, Government	Immediately
4.	The GoI should ensure on-line connection and uploading of data on electricity and gas consumption in buildings that are in possession of organisations belonging to the Ministry of Petroleum and the Ministry of Power	Government	Immediately
5.	UNDP CO in cooperation with the GoI should ensure continuation of the M&V activities in the pilot buildings after the project operational closure	UNDP CO, Government	Immediately
6.	The UNDP and GoI should ensure resources for continued training programmes of civil engineers, builders, and municipality inspectors so that they can effectively implement and enforce the energy efficiency regulations and standards throughout the country	UNDP CO, Government	Immediately
7.	The GoI should accelerate implementation of the adopted Energy Efficiency & Environment Market (EEEM) mechanism with special emphasis on removal of barriers to participation in the EEEM scheme and facilitation of coordination between different players in the energy efficiency market.	Government	Immediately
8.	The GoI should consider developing a system of incentives for participation of ESCOs in EE projects, e.g. establishment of a Help Desk for provision of information and advice to building owners on contracting ESCOs, such as list of qualified ESCO companies for M&V of EE measures in buildings with contact details and technical advice on rules of energy performance contracting.	Government	Immediately
9.	The GoI should address several barriers related to ESCOs, including certification and selection of ESCOs and mainstreaming of approval of legal documents for implementation of EE measures through ESCOs. It should also explore possibilities for establishment of a Super ESCO for EE in public buildings.	Government	Immediately
10.	The Government should continue public awareness campaign for energy efficient buildings using the channels of delivery established under the project. It should also consider establishment of a publicly accessible repository of all relevant documents and knowledge products resulting from the project.	Government	Immediately
11.	The project team should finalize the exit strategy and submit it to the Government for further consideration and planning of post-project activities.	PMU	Immediately
12.	For preparation of future projects on EE in buildings, the UNDP project development teams should carefully consider development of consistent sets of indicators and their targets compliant with the SMART criteria.	UNDP	For development of projects



## INTRODUCTION

In line with the GEF Evaluation Policy, a Terminal Evaluation (TE) is undertaken at completion of the GEF-funded projects to assess their performance (in terms of relevance, effectiveness, and efficiency), and determine outcomes and impacts (actual and potential) stemming from the project, including their sustainability. It is conducted to provide a comprehensive and systematic account of the performance of a completed project by assessing its design, implementation, and achievement of objectives. TE is also expected to promote accountability and transparency, facilitate synthesis of lessons learned, and provide feedback to allow the GEF to identify issues that are recurrent across the GEF portfolio.

This document presents results of the Terminal Evaluation of the UNDP/GEF project “Policy Reforms and Market Transformation of the Energy Efficient Buildings Sector of the I.R. Iran” (hereafter the EEEB Project). As a standard requirement for all projects financed by GEF, this terminal evaluation has been initiated by the Lead Implementing Agency, in this case UNDP Country Office (CO) in Iran. The evaluation was conducted in accordance with the GEF Monitoring and Evaluation Policy<sup>1</sup>, the Guidelines for GEF Agencies in Conducting Terminal Evaluations<sup>2</sup>, and the UNDP Evaluation Guidance for GEF Financed Projects<sup>3</sup>.

### Purpose and objective

The purpose of TE is to provide the project partners i.e. GEF, UNDP and the Government of Iran with an independent assessment of the key achievements of the project as compared to the original Project Document for the implementation period of the EEEB project. The TE provides assessment of the expected outcomes and their sustainability through measurements of the changes in the set indicators, summarize the experiences gained, identify and highlight lessons learned, and make recommendations for the future.

The Terms of Reference for the Terminal Evaluation is provided as Annex 1 to this report.

### Scope and methodology

The evaluation covers all activities undertaken in the framework of the EEEB project. The time focus of the evaluation is the implementation period of the project from August 2016 through February 2022. The geographic focus of the evaluation is Iran.

The evaluation used a participatory and consultative approach to inform and consult with all key stakeholders associated with the EEEB project, in particular the Government counterparts, the GEF operational focal point, the UNDP Country Office, the National Project Team, the UNDP/GEF Technical Adviser, representatives of the project ultimate beneficiaries, and others.

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<sup>1</sup> The GEF Monitoring and Evaluation Policy, Global Environmental Facility, November 2010

<sup>2</sup> Guidelines for GEF Agencies in Conducting Terminal Evaluation for Full-sized Projects, GEF, 2017 ([http://web.undp.org/evaluation/guideline/documents/GEF/TE\\_GuidanceforUNDP-supportedGEF-financedProjects.pdf](http://web.undp.org/evaluation/guideline/documents/GEF/TE_GuidanceforUNDP-supportedGEF-financedProjects.pdf))

<sup>3</sup> Guidance for Conducting Terminal Evaluations of UNDP-Supported, GEF-Financed Projects, UNDP, 2020 ([http://web.undp.org/evaluation/guideline/documents/GEF/TE\\_GuidanceforUNDP-supportedGEF-financedProjects.pdf](http://web.undp.org/evaluation/guideline/documents/GEF/TE_GuidanceforUNDP-supportedGEF-financedProjects.pdf))



The evaluation used the primary evaluation criteria listed in the Terms of Reference for the evaluation, i.e. relevance, effectiveness, efficiency, sustainability, and impact of interventions. Since it may take some time for the impacts to be realized, the evaluation aimed at determining the level of progress towards realization of planned impacts.

As an initial step, the evaluators conducted initial screening and limited desk review of documents covering the project design and implementation progress. Results of the initial review provided foundation for formulation of evaluation questions as discussion points that aim at gathering information from project stakeholders and beneficiaries about their attitudes and preferences as well as collecting factual information from relevant sources linked to the performance indicators. The evaluation questions were incorporated into the Evaluation Matrix that was used during the data collection and analysis phase. The Evaluation Matrix is provided in Annex 2.

### Data collection and analysis

Collection of the first-hand information was conducted through semi-structured interviews with selected project stakeholders. Since travel of the international consultant to Iran was not possible due to the COVID-19 pandemic travel restrictions, the interviews were performed remotely using the telecommuting modalities, such as internet meeting platforms.

The interviews were designed to solicit responses to a set of predetermined open-ended questions aiming to obtain in-depth information about the key informants' experiences from the project implementation and their opinions on the achievement of the planned results. They were based on a semi-structured format, in order to allow the respondents to express their perception of the main issues related to the project implementation.

The evaluation criteria and the questions were used as a check list to raise eventual additional and/or more specific questions on the issues mentioned. Triangulation of results, i.e. comparing information from different sources, such as documentation and interviews, or interviews on the same subject with different stakeholders, were used to corroborate and check the reliability of evidence.

In addition to the on-line interviews, the National Consultant visited a selection of pilot projects to make a spot check of the installed energy efficient and renewable energy measures in existing buildings. Criteria for the pilot projects' visit were discussed with the PMU who assisted with organisation of the visits.

The list of interviewed project stakeholders is provided in Annex 3. In addition, the national consultant visited selected pilot projects for demonstration of EE measures and conducted face-to-face interviews with their representatives. The list of the visited pilot projects is provided in Annex 4.

The following text provides a conceptual framework of methodology for data collection and analysis under the evaluation criteria.



## *Relevance*

### Conceptualization/Design

The evaluation assessed whether the approach used in design and selection of the EEEB project interventions addressed the root causes and principal threats in the project area. This also included an assessment of the project logical framework and whether the different project components and activities proposed to achieve the objective were appropriate, viable and responded to contextual institutional, legal and regulatory settings of the project. Furthermore, it assessed the indicators defined for guiding implementation and measurement of achievement and whether lessons from other relevant projects (e.g., same focal area) had been incorporated into the project design.

### Country ownership and stakeholder participation

The evaluation assessed the extent to which the EEEB project idea/conceptualization had its origin within national and sectoral development plans and to what extent it focused on national environment and development interests., including changes over time. It also provides assessment of information dissemination, consultation, and stakeholder participation in design stages of the project.

### Replication and linkages

The evaluation determined the ways in which lessons and experiences coming out of the EEEB project were/are to be replicated or scaled up in the design and implementation of other projects (this is also related to actual practices undertaken during implementation). It looked at linkages between the EEEB project and other interventions within the sector and the definition of clear and appropriate management arrangements at the design stage. This element also addressed the question of to what extent the project addressed UNDP priorities and cross-cutting issues such as gender, south-south cooperation, and poverty-environment linkages (sustainable livelihoods). It also examined linkages between the EEEB project and the UNDP normative programming instruments and response of the UN system to national development priorities in the form of UNDAF and CPD for the recipient country.

## *Effectiveness and efficiency*

### Implementation approach

This part of the evaluation includes assessments of the following aspects:

- The use of the logical framework as a management tool during implementation and any changes made to the framework as a response to changing conditions and/or feedback from monitoring and evaluation (M&E) activities if required;
- Other elements that indicate adaptive management such as comprehensive and realistic work plans routinely developed that reflect adaptive management and/or; changes in management arrangements to enhance implementation;
- The project's use/establishment of electronic information technologies to support implementation, participation, and monitoring, as well as other project activities;



- The general operational relationships between the institutions involved and others and how these relationships have contributed to effective implementation and achievement of project objectives;
- Technical capacities associated with the EEEB project and their role in the project development, management, and achievements.

#### Monitoring and evaluation

Under the M&E, the evaluation includes an assessment as to whether there has been adequate periodic oversight of activities during implementation to establish the extent to which inputs, work schedules, other required actions and outputs are proceeding according to plan; whether formal evaluations have been held and whether action has been taken on the results of this monitoring oversight and evaluation reports.

#### Stakeholder participation

This includes assessments of the mechanisms for information dissemination in the project implementation and the extent of stakeholder participation in management, emphasizing the following:

- The production and dissemination of information and lessons generated by the project;
- Local resource users and NGOs participation in project implementation and decision making and an analysis of the strengths and weaknesses of the approach adopted by the EEEB project in this field;
- The establishment of partnerships and collaborative relationships developed by the project with local, national and international entities and the effects they have had on project implementation;
- Involvement of governmental institutions in the project implementation and the extent of governmental support to the project.

#### Financial planning and procurement management

The assessment in the field of financial planning looks into the actual EEEB PROJECT cost by objectives/outputs/activities and the cost-effectiveness of achievements, financial management (including disbursement issues) as well as co-financing of the EEEB PROJECT. It assessed technical and human resource capacity for procurement, linkage between work programming and procurement planning and budgeting as well as effectiveness of procurement management.

#### Assessment of project results

The GEF Monitoring and Evaluation Policy (2010) specifies that terminal evaluations will, at the minimum, assess achievement of outputs and outcomes, and report on these. While assessing a project's results, the evaluation determines the extent to which the project objectives – as stated in the documents submitted at the GEF CEO Endorsement stage – have been achieved. The evaluation also indicates any changes in project design and/or expected results after start of implementation.



### Attainment of outcomes/ Achievement of objectives

Through review of the EEEB project results framework, the evaluation revisited the original outcome model (also known as the results map) in the Project Document and examined the causal logic of the initiative under evaluation and whether and eventually how it developed during the life of the project. The revisited outcome model served as a map that captures knowledge of the project stakeholders and boundary partners about how an outcome is intended to be achieved. The model also identified the intended target group of the initiative at the outcome level and the expected changes that the initiatives will contribute to.

### *Sustainability*

The assessment of sustainability includes an assessment of the extent to which benefits continue, within or outside the project domain after GEF assistance/external assistance has come to end as well as eventual development of a sustainability strategy.

### *Progress to impact*

It is often too early to assess long-term impacts of GEF projects at the point of project completion hence the evaluation assesses whether there is any evidence on progress towards long-term impacts as well as the extent to which the key assumptions of the project's theory of change hold and the extent to which the eventual progress towards long-term impact may be attributed to the EEEB project.

In addition to the analysis of progress to impacts in terms of available qualitative and quantitative evidence on environmental stress reduction, the evaluation also examined the project's contributions to changes in policy/ legal/regulatory framework, including reported and/or observed changes in capacities (awareness, knowledge, skills, infrastructure, monitoring systems, etc.) and in access to and use of information (laws, administrative bodies).

### Other assessments

The evaluations assessed the following additional topics for which ratings are not required:

- **Materialization of co-financing:** the evaluation provides information on the extent to which expected co-financing materialized, whether co-financing was cash or in-kind, whether it is in form of grant or loan or equity, whether co- financing was administered by the EEEB project management or by some other organization, how short fall in co-financing or materialization of greater than expected co-financing affected the project results, etc.
- **Gender Concerns:** The evaluation makes assessment of the extent to which the gender considerations were taken into account in designing and implementing the EEEB project, the extent to which the project was implemented in a manner that ensures gender equitable participation and benefits, and whether gender disaggregated data was eventually gathered and reported on beneficiaries.



### Evaluation ethics

The evaluation was conducted in accordance with the ethical principles outlined in the UNEG Ethical Guidelines for Evaluations, namely the four guiding ethical principles for evaluation: Integrity, Accountability, Respect, and Beneficence<sup>4</sup>.

### Limitations of the evaluation

Since visit of the international consultant was not possible due to the COVID-19 travel restrictions, interviews with selected EEEB project stakeholders were conducted virtually and remotely through on-line meeting platforms. This limited the ability of the Evaluators to use direct observation at the stakeholder and beneficiary institutions for gathering additional information, triangulating previously obtained information, and getting a broader picture. This limitation was partially mitigated through arrangement of the physical visits to selected pilot projects by the National Consultant.

### Structure of the evaluation report

The structure of the TE report follows the “Evaluation Report Outline” presented in the Terms of Reference (ToR) for the assignment.

The ‘Executive Summary’ of the report is provided in the beginning of the report. The body of the report starts with introduction and development context of the EEEB project and continues with a short project description. This is followed by the chapter that sets out the evaluation findings presented as factual statements based on analysis of the collected data. The findings are structured around the five essential evaluation criteria and include assessment of the project performance against the performance indicators and their target values set out in the project results framework (as provided in the EEEB Project Document). This part further includes assessment of the project management arrangements, financing and co-financing inputs, partnership strategies and the project monitoring and evaluation systems.

The final part of the report contains conclusions and recommendations substantiated by the collected evidence and linked to the evaluation findings. While the conclusions provide insights into identification of solutions to important issues pertinent to the project beneficiaries, UNDP and GEF, the recommendations are directed to the intended users in terms of actions to be taken and/or decisions to be made. This part of the report concludes with lessons that can be taken from the evaluation, including good practices that can provide knowledge gained from the particular project circumstances that are applicable to similar UNDP interventions.

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<sup>4</sup> UNEG Ethical Guidelines for Evaluation, 2020

[https://www.unodc.org/documents/evaluation/Guidelines/UNEG\\_Ethical\\_Guidelines\\_for\\_Evaluation](https://www.unodc.org/documents/evaluation/Guidelines/UNEG_Ethical_Guidelines_for_Evaluation)



## PROJECT DESCRIPTION

### Project start and duration

The EEEB project was approved as a 4 -year full-size GEF-4 project. The signature of the Project Document by the Government of Iran on 18 August 2016 officially marked the start of the project implementation. The original project completion date was 18 August 2020. The project duration was extended by 18 months, including 6-month extension because of COVID-19 impact thus the revised completion date was 18 February 2022.

### Development Context

The Islamic Republic of Iran is the world's seventh largest emitter of carbon dioxide (CO<sub>2</sub>), and also, among the countries eligible for GEF support, ranks fifth in terms of CO<sub>2</sub> emissions. The residential and commercial building sectors represent some 23% of the country's CO<sub>2</sub> emissions. Furthermore, the building sector consumes more than 38 percent of the total final energy in Iran. In recent decades, Iran has undergone rapid urbanization, with 70% of the population now living in urban areas and there are presently 2.83 million non-residential (commercial, industrial and agricultural) buildings in the country. Of these 77% were estimated to be in urban areas, and the remaining 23% in rural regions.

The dominant energy carrier in Iran is natural gas, for which there are three main end-uses in the residential sector: space heating (75%), water heating (15%) and cooking (10%)<sup>5</sup>. Iran's energy consumptions for space heating and home appliances are 2.5 and 1.8 times the global average respectively. Total energy use in the building sector is much higher in Iran than the European average, although electricity consumption per square meter is lower. Combined with growing demographic trends, this will result in an increased annual demand for energy and ever-higher GHG emissions. Increasing energy efficiency in buildings therefore will be an important contribution to reducing emissions and climate change mitigation.

In response to these challenges, Iran's National Climate Change Office was established in January 1998 under the auspices of the Department of Environment with support from UNDP/GEF. Among other responsibilities, the Office has built national capacity to systematically address climate change issues. Considerable efforts have been recently made to improve the status of energy efficiency in buildings. The Committee for Energy Efficiency and Environment (CEEE) was established as a cross-sectoral organizational body responsible for coordinating the activities of the various relevant stakeholders. Also, Iran's national priorities concerning energy and environment are reflected in (i) Article 50 of the Iranian Constitution, adopted in 1979, requires that the environment is preserved to ensure that the needs of the country's future generations are met, (ii) The Environmental Protection and Improvement Act (1974) calls for both preventive and remedial measures for the protection and rehabilitation of

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<sup>5</sup> Sustainable Energy Strategy for Iran, Wuppertal Institute for Climate, Environment and Energy (2015)



the environment, (iii) The Common Country Assessment (CCA) states that one of the country's goals is to increase energy efficiency and reduce air pollution, (iv) Iran's Vision Plan 2025 sets out the overall national strategy, and includes an emphasis on reducing energy waste, reducing energy intensity, diversifying energy sources and increasing the share of renewable energy sources.

### Problems that the project sought to address

The Project Document provides an explicit list of barriers to widespread applications of energy efficient technologies in buildings that were assessed through baseline research and discussed with the project stakeholders. These barriers are described below in priority order. The project is designed to address all these barriers.

- Lack of coordinated EE policies (very high priority): Policies on reducing electricity and fuel use are largely independent and the building code is separate as well. This leads to duplication of effort, insufficient co-ordination, reducing cost effectiveness and causing confusion with stakeholders, with the risk of reducing credibility of policy.
- Lack of unified body (very high priority): Two ministries deal with energy, each with several agencies, responsible for electricity and fossil fuel. Building codes come under a third Ministry. There has been relatively little collaboration and integration.
- Lack of adherence to EE practices (very high priority): The design, installation, maintenance, and operation of heating systems do not take into account good energy efficiency and optimal operation practices. This leads to poorly designed and poorly operated systems, with sub-optimal performance and loss of energy.
- Lack of energy standards (very high priority): Minimum Energy Performance Standards (MEPS) are lacking for key heating products and systems, including SWHs. The building code on EE is inadequate as it does not account for multiple thermal zones, air flow, solar gains, or humidity. Energy labels exist for only a few products. Standards do not yet exist for boiler components (such as boilers, burners, pumps) or buildings components (such as double pane windows and thermal insulation). Without them, most designers and builders will lack incentives to produce more efficient buildings.
- Lack of training and interest of professionals (very high priority): Levels of training are low, and training on energy issues, at technical and professional levels, is very limited. Architects, builders, boiler room engineers, and window fitters all need training, ideally with accreditation. Installed heating systems are often of poor quality as a result of low-quality products having been used for building the systems, and lack of attention to energy efficiency and optimal operation of the systems in installation, maintenance and operation of heating systems is prevalent. Policy implementation is critically dependent on the skills and resources of the building and heating supply chain to implement them. This will prevent the necessary integration of energy efficiency in building design and operations.



- Lack of enforcement of product standards, energy labels and building energy codes (high priority): There is evidence that building codes are not well enforced through the municipalities. Engineers assessing code compliance lack appropriate training for inspecting heating systems. Test facilities for products, to check MEPS and energy label compliance, are very limited and there is very little appliance/product testing done. There is currently no penalty for not displaying energy labels on products.
- Lack of testing facilities (high priority): Testing facilities for fuel consuming appliances are very limited and there are no laboratories for testing central heating components. SABA has only two facilities for testing the efficiency of electrical equipment. Without adequate test facilities it is not possible to enforce compliance, to undertake accurate energy audits or for consumers (commercial, public or domestic) and to have confidence in products or energy labels.
- Lack of energy efficient products (high priority): Out-dated, low efficiency energy using products are produced by many manufacturers. Efficient products need to be available for policies to be effective. This would mean that the demand generated by the project through greater public awareness, cannot be met.
- Low energy prices (high priority): Energy prices were heavily subsidized, (for heating fuels to as low as 5% of their international market value). Prices increased considerably in December 2010 and subsidies were set to be further reduced over the next few years. Low energy prices made EE measures less economically viable and thus less attractive to consumers.
- Lack of public awareness on energy efficiency (medium to high priority): The profusion of different initiatives led by different organizations, together with a lack of understanding of energy use, particularly in households, has reduced the impact of energy campaigns to date and awareness is thought to be low. The uptake of measures such as retrofitting heating systems, double pane windows, SWH, etc. will be limited if consumers are not convinced of the benefits. And resulting in low household demand for relevant products. There is a risk that the public may not engage with the project goals, and therefore not attempt to change their behaviours and purchasing habits.
- No household demand (medium priority): This is due to a number of other barriers including low energy prices, low compliance with energy labels and low levels of public awareness. Thus, it will largely be addressed by reducing other barriers.

### Immediate and development objectives of the project

The goal of the EEEB project is the reduction of greenhouse gas emissions in the building sector in Iran, through the transformation of market, facilitated by removing barriers for the implementation of heating system improvements and encouraging retrofitting in existing buildings and mitigating future emissions by setting standards for new buildings.

The objective of the project is to achieve GHG emission reduction in Iran's buildings sector through legislative, policy and regulatory reforms and implementation of cost-effective



mitigation measures as well as increasing the share of solar water heating to meet the energy requirements of new buildings and the existing stock. Implementation of policies on energy efficiency and developing appropriate means of applying building energy codes are among the interventions of the present project that would lead to reduced GHG emissions. It was envisaged to achieve this objective by (i) reviewing the legislative, policy and regulatory frameworks that impact building efficiency in Iran; (ii) revisiting the building code and products standards and labels and developing a supportive cross-sectoral energy efficiency strategy; (iii) piloting installations of energy efficient and renewable energy measures in existing buildings; and (iv) transforming the market by training manufacturers and building professionals to produce and install energy efficient heating systems, and developing a stakeholder awareness-raising campaign and developing proposals for financing mechanisms for households.

### Expected results

The EEEB project was designed to provide global environmental benefits in through contribution to GHG emission reductions as a combination of:

- Direct GHG emission reductions of approximately 1.0 Mt CO<sub>2</sub> over the lifetime of the investments, and
- Indirect GHG emission reductions of up to 153 Mt CO<sub>2</sub> over the project impact period (2020-2029) relative to the baseline, of which approx. 153 Mt CO<sub>2</sub> are incremental savings (relative to the base case).

Apart from the global benefits, the EEEB project was expected to induce associated national and local benefits as follows:

- Creation of a favourable enabling environment for self-sustained replication of building energy efficiency measures and practices in Iran;
- The CSSAP, along with the revised policies and regulations, to serve as foundation for all future EE building initiatives;
- Reduced heating bills for the public, commercial and domestic users achieved by both reducing fossil fuel waste in heating systems and by increasing the use of solar energy for provision of hot water;

Besides the primary focus on energy use in heating, the EEEB project was expected to have knock-on effects on fossil fuel use in lighting and appliances through two routes:

- Improved co-ordination of energy policy between different parts of the Government and national and regional government, leading to greater and more co-ordinated activity, for example, combined auditing of building use of both fossil fuels and electricity, and
- Greater awareness of users (Government, commercial and residential) of the potential for and benefits of heat savings is likely to spill over electricity savings; for example increasing the uptake of appliances with higher energy ratings.

Secondary socio-economic benefits would accrue from the increased knowledge and capabilities of manufacturers and other actors in the supply chain (developers, installers,



maintenance engineers etc.) resulting in their enhanced competitiveness and increased share of export markets.

Table 1 below provides the expected results at the level of the Project Objective as per the approved EEEB Project Document.

**Table 1:** Expected results at the level of the Project Objective

Result	Indicator	End-of-project Target
<b>Project Goal:</b> Reduction of GHG emissions due to improved energy EE in the building sector in Iran	Cumulative CO2 emission reductions by 2029 from new buildings to be built during project lifetime (2016-2020) against baseline	153 Mt CO <sub>2</sub>
<b>Project Objective:</b> GHG mitigation from the buildings sector in Iran through legislative, policy and regulatory reforms and implementation of cost-effective mitigation measures as well as increasing the share of solar water heaters to meet the energy requirements of new buildings and existing stock.	Average thermal energy consumption for space and water heating in pilot buildings by end of project (residential & non-residential)	Around 166 kWh/year.m <sup>2</sup> on average
	Average thermal energy consumption for space and water heating in new and existing buildings in Iran by 2029 (residential & non- residential)	Around 208 kWh/year.m <sup>2</sup> on average

### Main project stakeholders and key partners involved

Stakeholder engagement is an inclusive and continuous process between a project and those potentially impacted that encompasses a range of activities and approaches. It is arguably one of the most important ingredients for a successful project delivery and therefore an essential element of this project.

The design of the EEEB project is based on multi-stakeholder engagement and consultations to ensure national institutional ownership of the project. Iran's energy efficiency institutional set-up is quite complex, with a diversity of organizations sharing various related responsibilities. The EEEB Project Document provides only a brief outline of the main project. The Inception Report that was prepared in May 2017 contains a more coherent analysis of the stakeholders with division of the stakeholders three groups defined as follows:

The Regulatory Group contains stakeholders responsible for development, introduction and enforcement of public policies (governmental and local policy makers);

The Supply Group comprises entities that either build, sell, trade on the energy efficient building market, insure, finance, and provide a broad range of energy solutions;

The Demand Group is the general public buying, renting, or living in the energy efficient buildings, with special target on the population of the Tehran city.

According to the Law on "Reform on Energy Consumption Pattern", policy making in the energy sector, including renewable energies and energy efficiency (production and consumption), is the responsibility of the Supreme Energy Council (SEC) chaired by the President, who assigned this responsibility to his deputy in the Planning and Budgeting



Organization. Other members include the Minister of Petroleum, Minister of Energy, Minister of Economic Affairs and Finance, Minister of Industry, Mine and Trade, Minister of Agriculture, Head of Atomic Energy Organization, Head of Department of Environment.

Responsibility for the formulation and implementation of the energy policy is split among a number of the GoI departments and their agencies. All these organizations work to improve energy efficiency in accordance with the 5-year Development Plan, the Law on Energy Consumption Pattern Reform and the Law on Elimination of Barriers to Competitiveness and Promoting Financial System.

The original stakeholder involvement plan at the EEEB project inception is provided as Annex 5.

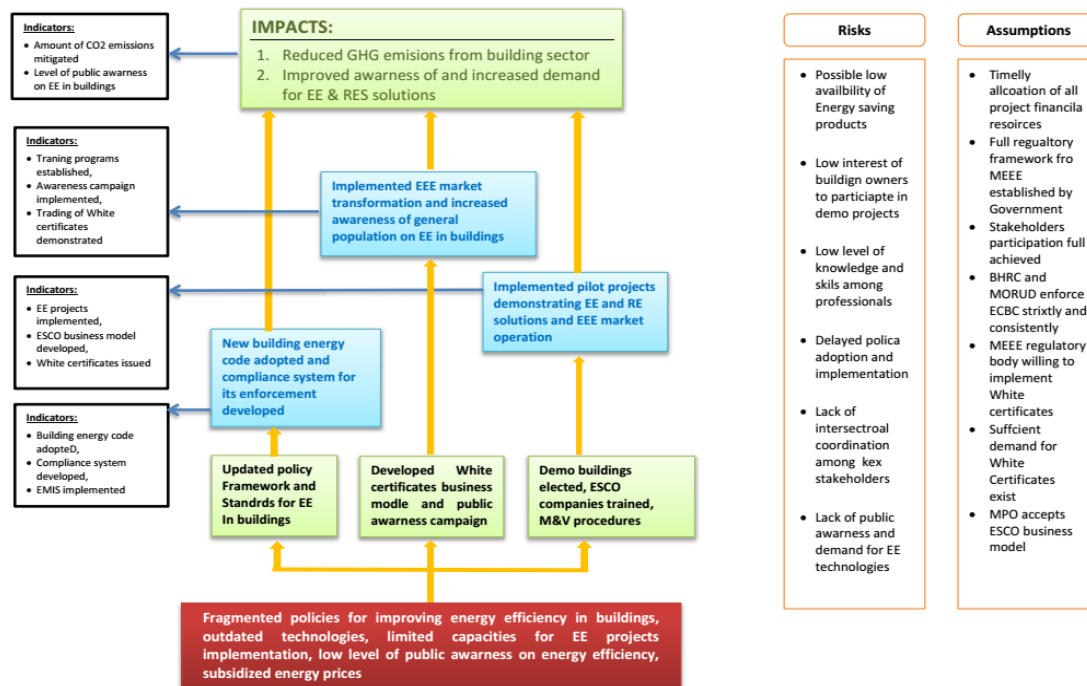
### Description of the project's Theory of Change

The theory of change of a project looks at development challenge, immediate cause, underlying cause and the root causes/ barriers, as well as a hierarchy of expected results of the project, from outcomes to overall impact identified in accordance to specific political, regulatory, financial, technical and environmental risks and assumptions.

The interrelationships of the Theory of Change for the EEEB project are schematically outlined on Display 1.



## Display 1: EEEB project Theory of Change



The key problem of Iran building sector is low energy efficiency of building heating systems. High GHG emissions are direct consequence of that. Therefore, the project aims at improving energy efficiency of public and private buildings in Iran by addressing the main barriers, which according to the barriers listed in previous section could be summarized in three groups: inadequate motivation and access to finance, underdeveloped local technical capacities for implementing EE in buildings, and inadequate policy and regulatory framework for energy efficient building sector. To remove these barriers (root causes) related to, the project design adopted a three-pronged approach.

- Under Component 1, the work was planned with relevant national and municipal public authorities to design and adopt policies and regulations and to improve coordination among policy stakeholders in order to enable uptake of EE and RES measures in public and private buildings as well as improving the enforcement of the existing and updated policies and regulations.
- Specific EE and RES solutions were envisaged for implementation under Component 2 on existing buildings in order to demonstrate state of the art technologies for building heating systems and advanced maintenance and operation practices.
- Lack of finance and motivation for implementation of EE measures were addressed under Component 3 by supporting ESCO and knowledge-based companies to provide EE solution against certified claims for energy savings achieved. The same component envisaged conduct of national awareness-raising and an advocacy campaign to secure public support and promote behavioural changes towards energy efficient heating in



buildings. The expected result is EE market transformation by creating skills and implementation capacities on the side of EE service and equipment providers, by stimulating demand for such service at the end users, and by providing financial mechanisms for EE project implementation through introduction of EE certificates. These tasks may be performed by utilization of an Energy Management Information System (EMIS) which act as a decision-making tool as well as implementation.

#### Total resources

The GEF grant approved for the EEEB project amounts to US\$ 4,000,000 complemented with US\$ 28,516,760 expected parallel financing by the Government and UNDP. The total amount of resources committed to the EEEB project at inception was thus US\$ 32, 516,760.



## FINDINGS

### Project Design/Formulation

This section provides a descriptive assessment of the achieved results. In addition, several evaluation criteria are rated in line with the requirements for Terminal Evaluations for UNDP/GEF projects.

### **Analysis of the project results framework**

This section provides a critical assessment of the Project Results Framework (PRF) in terms of clarity, feasibility and logical sequence of the project outcomes/outputs and their links to the project objective. It also examines the specific indicators and their target values in terms of the SMART<sup>6</sup> criteria.

The EEEB project design was affected by an unusually long period of preparation. While normally the period between submission of the Project Identification Form (PIF) and the signature of the Project Document is about 2 years, in this case the period of preparation was 8 years.

The PIF was initially submitted in September 2008, resubmitted in February 2009, and approved in June 2010. The Project Document was endorsed by the GEF CEO in June 2012.

Although the project was approved by the GEF and UNDP in June 2010, the signing of the Project Document was six years delayed (August 2016) because of the UN sanctions on Iran<sup>7</sup>. The Project Document was subject to a substantive revision in 2014/2015 in line with the “Law on Elimination of Barriers for Competitive Production and Financing System (Article 12)”, and finally signed by the Government in August 2016. The project Inception Report produced in May 2017 provided a minor amendment of the project in line with the GEF Project and Programme Cycle Policy<sup>8</sup>.

The original PRF comprised of 3 substantive (technical) components/outcomes divided into 15 substantive outputs. In the revised PRF after the amendment of the project, the number of outputs was reduced to 10 through merging original outputs under Components 2 and 3. It should be also noted that the amendment included a new output on development of the EMIS that had not been in the original PRF. For measurement of achievement of the planned results, the revised PRF contains total 30 indicators and their corresponding mid-term and end-of-project (EOP) targets. A majority of indicators/targets are quantitative in nature.

The revised PRF was subject to detailed critical review during the Mid-Term review (MTR) of the project in late 2019. The MTR team found 13 indicators/targets not in line with the SMART criteria. Furthermore, the MTR consultants in their report suggested a comprehensive review and revision of the PRF by the project team and stakeholders in order to identify more realistic

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<sup>6</sup> SMART stands for Specific, Measurable, Attainable, Relevant, Time-bound.

<sup>7</sup> UN Security Council Resolution 1737 of 23 December 2006 and subsequent UNSC resolutions

<sup>8</sup> Minor amendments are changes to project design or implementation that do not have significant impact on the project objectives or scope, or an increase of the GEF project financing up to 5%.



and feasible indicators and targets closely related to the project's planned results (MTR Recommendation 1). It was proposed that the revision of the PRF would be discussed and approved by the PSC and further agreed with UNDP and GEF. However, in response to the above MTR recommendation, only updated implementation plan and budget revision were prepared while the PRF was actually not revised.

The TE team concurs with the observations and conclusion in the MTR report that definition of several indicators and targets in the PRF was not consistent with the planned results and that the PRF as a whole did not provide enough guidance to the project team for prioritization and sequencing of activities and outputs for smooth and steady progress towards all planned results.

### *Assumptions and risks*

Identification of risks enables the implementing partners to recognize and address challenges that may limit the ability of the project to achieve the planned performance outcomes.

A preliminary risk analysis was conducted at the Project Identification Form (PIF) stage and identified 3 risks to achievement of the project objectives. The PIF also rated all risks as modest and outlined corresponding mitigation measures.

Annex A of the Project Document contains a project risk log that contains 9 risks of different types with risk rating in terms of probability and impact that allows for identification of critical risks (high in both probability and impact) for the purpose of further monitoring during the project implementation.

The risk log in the Project Document was later revised and Annex 7 of the EEEB project Inception Report contains a revised risk log that is summarised in Table 2 below.



**Table 2: Summary of project risks and mitigation measures**

No.	Risk Description	Risk type	Rating*	Risk mitigation measures
1.	Potential lack of public awareness and demand for EE Technology and appliances	Strategic	P = 2 I = 4	A focused public awareness campaign and a financial incentives strategy will be put in place to encourage awareness and uptake
2.	International Sanctions (not in the Project Document)	Political	P = 3 I = 4	The project aims to increase the capability of local manufacturers to make higher efficiency products UNDP should play the role of facilitator to ensure energy efficiency technologies import establishment
3.	Potential lack of inter-sectoral coordination between project key stakeholders including line ministries, municipalities, and private sector	Political Regulatory Strategic	P = 2 I = 4	To mitigate this risk, UNDP will ensure the presence of a strong project steering committee (PSC) mechanism, which will include all relevant stakeholders. The PSC will facilitate cross-sectoral involvement and coordination from the ministerial to the private sector and community levels, review outputs, and ensure that the project strategies meet national goals and objectives. The Cross-sectoral Strategy and Action Plan that will be developed under the project will include clear institutional roles and coordination mechanisms
4.	Potential for weak or delayed policy implementation, most notably lack of enforcement of the more stringent energy efficient building codes and MEEE	Political Regulatory	P = 2 I = 4	The project will introduce punitive measures and penalties for non-compliance with the thermal building code. Training courses will be provided for different stakeholders in the building value chain on the revised thermal code. These courses are intended to build capacity for monitoring and verification of the code. Testing facilities and enforcement training will be addressed as part of the CSSAP and MEEE established
5.	Low level of knowledge and skills among local professionals to integrate energy efficiency in building design and operations	Operational	P = 2 I = 2	The project will provide technical assistance to build capacities of various local stakeholders involved in building design, construction, and operation
6.	Possible low availability of the energy saving products	Strategic	P = 1 I = 2	The project aims to increase the capability of local manufacturers and knowledge-based companies to make higher efficiency products. If local supply cannot satisfy demand in the short-term products can be imported.
7.	It may not possible to find enough low efficiency Government owned buildings to meet the target of retrofitted systems in the pilot phase	Strategic	P = 1 I = 1	The evidence available to date is that the Government owned building stock reflects that of the stock in general (i.e. it is low efficiency) and the Government owns a large number of buildings – so this is unlikely to be a problem. The pilot will also target 200 privately owned residences
8.	It may not be possible to find energy saving measures for the pilot phase which are cost effective	Strategic	P = 1 I = 2	The current situation suggests that there are extensive energy savings from simple, low -ost measures so the risk of this is low. If this does turn out to be the case expertise available through the involvement of both local and international experts increases the chances that low cost solutions will be found.
9.	There may be a low level of interest from engineers in receiving training in energy saving installation and maintenance	Operational	P=1 I=2	The introduction of a revised building code and new and revised energy standards and labels for heating products due to the project will provide a major incentive for engineers to want training in these areas in order to remain employable and competitive
10.	Potential strong negative public reaction to the reduction of fuel price subsidies (not in the Inception Report)	Political	P = 1 I = 3	The Government is unlikely to change their mind on such a key policy which removes a non-progressive subsidy and encourages energy wasteful behaviour

\*I=impact, P=probability, both rated on a 5-point scale (low to high)

It follows from Table 2 that almost all risks identified in the Project Document were transferred to the Inception Report with the exception of the risk of negative public reaction to reduction of fuels price subsidies (#10) that was dropped from the risk log. Moreover, the risk of international sanctions (#2) was introduced in the revised risk log in the Inception Report.

The evaluators found the assumptions and identification of risks at the project inception well-articulated and sufficiently detailed. However, the two political risks appeared to have been were underrated and also it is not clear why the risk #10 was not considered further as the evaluators consider it one of the prominent risks to successful introduction and enforcement of EE measures.

In line with standard UNDP requirements, highly rated risks (5 in terms of impact or when impact is rated 4 and probability at 3) are considered as critical risks and should be further monitored and annually reported.



The section ‘Critical Risks’ in the annual PIRs contains discussion of several regulatory, financial and operational risks. The risk of insufficient regulatory arrangements and lack of inter-sectoral coordination among all project key stakeholders was further monitored in the 2018-2020 PIRs. The risk of “low level of knowledge and interest among professionals”, was described in the 2019 and 2020 PIRs as “lack of sufficient technological and technical capacity for scaling up the pilots to national level (the need for more ESCOs, suppliers, technology providers and other corresponding actors)”.

The annual PIRs also contained financial risks that were not identified at project inception described as “lack of sustainable financial scheme to support ESCO business and developing energy efficiency and environment market” (2019 PIR) and “low interest and engagement from public and private sectors (like banks and financial institutions) in establishing green energy efficiency fund to support EEE market” (2020 PIR). In the last 2 years of the project, there was also acknowledgment of operational risks related to COVID-19 outbreak with impact on delays in project implementation.

The MTR made a detailed assessment of the already identified project risks and added few additional risk areas, such as lack of prioritization of EE by national authorities, risks to scaling up the pilots and lack of energy performance information, as well as devaluation of local currency. Based on that assessment, the MTR recommended that monitoring of the project risks through the risk log or risk register should be addressed by the project team and brought to the attention of the Project Steering Committee and that risks in the risk log should be categorized by level and actions for reducing their likelihoods (Recommendation 6).

The TE concludes that despite there was some effort on monitoring of the already known risks and identification of new ones, the overall management of project risks was not conducted in a systematic manner that would ensure more effective mitigation of the risks.

#### *Lessons from other relevant projects incorporated into project design*

The Project Document does not mention any relevant projects or lessons learned from similar interventions in the country that were incorporated into the project design. The main focus of work of UNDP Iran prior to the EEEB project under the environmental portfolio was in the areas of biodiversity, climate change adaptation and reduction of ozone-depleting substances but did not include any activities directly related to energy efficiency. Therefore, there was no experience accumulated that could be relevant for the EEEB project.

#### *Planned stakeholder participation*

The Project Document provides an outline of key stakeholders involved in preparation of the project including their expected roles the project. The planned stakeholder participation is satisfactory in identification of the stakeholders and justification of their involvement in the project, but the stakeholder analysis does not go deeper into distinction between core (primary) and secondary (tangential) stakeholders.

It was expected that Government stakeholders would play key roles in legislation, management, monitoring of the project progress and communication of its results. The expected main entry point for involvement of the GoI stakeholders was participation in meetings of the Project Steering Committee through which the Government stakeholders



assume an active role in the decision-making for effective and efficient implementation of the project.

### *Linkages between the project and other interventions within the sector*

There were three major interventions relevant to the EEEB project.

In 2014-2018, the Japan International Cooperation Agency (JICA) implemented the project on “Implementation of Pilot Projects to Introduce ESCO for Government’s Buildings in I.R. of Iran”. The objective of the project was technical cooperation on development of policy and institutional framework for the promotion of the ESCO business model and transfer of the know-how and Japan’s experience with ESCO contribution to EE in the building sector.

In 2018, the project “Supporting Iran in implementation of an integrated energy efficiency market” (the IREEMA project) was launched under funding by the International Climate Initiative (IKI) of the German Federal Ministry for the Environment, Nature Conservation and Nuclear Safety. The objective of the project is to enhance understanding of the energy market and create new start-ups and knowledge-based companies in this sector.

In 2017-2018, a national pilot project on “Efficiency Improvement in Buildings and Energy Optimization in Boiler Houses” was implemented based on a directive passed by the Iranian Economic Council that allowed the Ministry of Petroleum to invest US\$ 2 billion to improve the efficiency of boiler houses. This intervention was designed to support various energy-saving measures (e.g. burner adjustment, installation of smart gas meters, insulation, automatic scale removers, etc.) in 500,000 residential and 100,000 public buildings.

The above three initiatives were implemented in parallel with the EEEB project. Despite the MTR made a recommendation to the project team and stakeholders to identify lessons and complementarities with the projects funded by JICA and the German and others that might be ongoing in the country, no particular links to the two above referenced projects were reported by the project stakeholders.

## **Project Implementation**

### **Adaptive management**

GEF evaluations assess adaptive management in terms of the ability to direct the project implementation through adapting to changing political, regulatory, environmental, and other conditions outside of control of the project implementing teams. The adaptive approach involves exploring alternative ways to navigate the projects towards meeting the planned objectives using one or more of these alternatives.

The main adaptive management decision was related to the substantive changes of the project context before the actual start of the EEEB project implementation. The project was conceived before 2010 but the project was officially approved through the signing of the project document by the GoI in August 2016. During the prolonged conceptualization of the project, the political and socio-economic situation in Iran has changed significantly and the changes also affected the area of energy efficiency. A major overall adaptive decision was taken to conduct a substantive revision of the PRF after the project Inception Workshop and the revised PRF was



attached to the project Inception Report produced in May 2017. The IR provided a good overview of the situation and description of measures aimed at strengthening the project design and implementation approach.

Another case of adaptive management was related to adjustments in Component 2 for implementation of pilot renovation project in residential and public buildings. The Project Document envisaged about 400 pilots to be implemented in 4 stages (batches) on 80 non-residential and 320 residential buildings. In order to widen the scope of interventions, no restrictions were imposed with regard to the building type and the EE measures applied and the pilots focused on building complexes with larger number of units.

At the very outset, the project team took decision on definition of a “pilot” with the aim to clarify the ambiguity on this in the Project Document regarding setting of the standard areas for residential and non-residential buildings. Based on consultations with stakeholders and previous definitions in a similar project, the project team proposed a size of 500 m<sup>2</sup> for residential buildings. Furthermore, the project team considers that the implementation of decided to focus “on large buildings.

Due to complexity of the technical and contractual matters of the pilots, a specialized company was hired for managing and supervising all pilot works. In order to accelerate the work, the MTR suggested merging the originally planned 3rd and 4th batches, but this was not implemented. The pilots were reorganised in the four batches as follows:

- Batch 1 for public- government office buildings;
- Batch 2 for residential buildings and private-commercial buildings;
- Batch 3 for public- government office buildings (to cover the number in log-frame);
- Batch 4 for residential buildings and private-commercial buildings

In recognition of limited possibilities of the participating ESCOs and building owners to provide financing for the EE measures, the project team designed the batches with gradual reduction of financial support from the project. This model was based on full financing of the works in the first batch with 60% of the total cost paid to the ESCOs after full installation and delivery of the equipment and the remaining 40% based on the performance of ESCOs and the realized energy savings. For the second batch, the financing from the project was reduced to 50% and the rest was to be allocated by the building owners.

The COVID-19 pandemic began to negatively impact the project deliverables in Iran since the end of February 2020 as the country faced six separate waves of infected cases. The most powerful wave occurred from November to December 2020. The project scope is in Tehran and as demonstrated, the situation colour is orange, while it is expected to become red in couple of days. The project team monitored the effect of the pandemic situation and associated issues on the project progress and in April 2021 drafted an internal plan on “Impact of COVID-19 outbreak on the EEEB Project Implementation”, in order to adapt the implementation to the new situation. Therefore, due monitoring and control approaches were applied in order to keep the project implementation on track.



## **Actual stakeholder participation and partnership arrangements**

The project is based on a multi-stakeholder approach and participation of the GoI as well as the private sector and the Tehran municipality. The project interventions involved several agencies of the GoI that fully supported the objectives of the project. The full engagement of the core project stakeholders was ensured through the PSC meetings and membership in several technical committees where the project stakeholders played active roles in the project governance and decision-making on implementation of various project activities.

For practical implementation of the by-law on the environment and energy efficiency market, VPST assigned the Department of Development of Water and Energy Technologies” (DWET) to spearhead the work in line with the endorsed EEEM by-law. The DWET presided the EEE market committee that held regular meetings reviewed and discussed development of market studies such as work instructions and other supporting technical documents for implementation of the before their by-law provided by EEEB project were reviewed and discussed in the market committee and after finalization have been proposed for endorsement by the Supreme Energy Council.

In the component one related to EE policies and regulations, the Building Energy Identification System (BEID) Committee was established and supervised the delivery of the EMIS system the to the BHRC. The membership of the BEID Committee comprised the Tehran Municipality, ICEO, IFCO, SATBA, as well as the National Iranian Gas Company (NIGC) and the Power Generation, Distribution and Transmission Company (known as Tavanir).

Within the component on the pilot projects, partnership was established with the Iran ESCO association (IRESCO) for support to the development of a practical ESCO business model, Measurement and Verification (M&V) frameworks and standards of the Energy Performance Contracts (EPC). The cooperation with IRESCO proved very important for reaching out to the ultimate beneficiaries as the participating ESCOs made effort for engagement with local communities and linking them to the project. In addition, the project team had regular meetings with the technical experts of the Iranian Fuel Conservation Company (IFCO) and SATBA for drafting a nationwide M&V instruction for the building sector.

Engagement of tangential (peripheral) stakeholders was ensured through their participation in specific activities and events organized by the PMU and involvement of academia and NGOs.

The evaluators found the actual stakeholder participation in line with the original stakeholder engagement plan and did not observe any major challenges for stakeholder engagement in the project. However, more involvement of relevant NGOs and universities in updating EE laws, by-laws and standards would have been beneficial for the project implementation.

## **Project finance and co-finance**

Analysis of the project financial aspects was based on the information sourced from the annual Combined Delivery Reports (CDRs) for the years 2016 – 2021. This analysis aims at assessment of the project financial delivery by years and by outcomes, and the share of the project management budget line in the total budget.



The GEF grant for this project was approved at US\$ 4,000,000 complemented with US\$ 28,516,760 expected parallel financing by the Government and UNDP. The total amount of resources committed to the EEED project at inception was thus US\$ 32, 516,760. Table 3 below displays the breakdown of expenditures from the GEF grant by the years of the project implementation period.

**Table 3:** Actual expenditures by years of implementation (as of 31 December 2021)

Project Component	Actual Expenditures (US\$)						
	2016	2017	2018	2019	2020	2021	2016-2021
Outcome 1	-	56,574.16	141,805.03	268,223.26	163,630.05	132,347.34	762,579.84
Outcome 2	-	24,915.35	33,972.87	339,926.58	457,632.37	749,534.40	1,605,981.57
Outcome 3	-	36,728.02	51,050.61	114,223.48	96,515.88	187,526.48	486,044.47
Outcome 4	-	3,682.22	2,771.88	12,880.47	21,661.01	20,666.27	61,661.85
Project Management	15,221.45	41,483.64	23,091.95	43,754.11	35,973.69	16,628.41	160,931.80
<b>Total</b>	<b>15,221.45</b>	<b>163,383.39</b>	<b>252,692.34</b>	<b>779,007.90</b>	<b>775,413.00</b>	<b>1,106,702.90</b>	<b>3,077,199.53</b>

It follows from Table 3 that the total expenditure from the GEF funds at the project closure was US\$ 3,077,199.53. Furthermore, the data demonstrate the dynamics of the implementation progress, in particular the slow start of implementation in the first 2.5 years (August 2016-December 2018) with the total delivery of US\$ 431,297.18, that is only 14% of the GEF grant. A majority of the GEF funds (about 60%) was disbursed during the last two years (2020-2021) when the pilot projects on demonstration of EE measures were launched.

Table 4 below provides comparison of the planned and actual expenditures by the project components.

**Table 4:** Planned and actual disbursement of the GEF funds by components – as of 31 December 2021

Project Component	Budget (US\$)	Expenditures (US\$)	%
Outcome 1	850,000	762,579.84	89.72
Outcome 2	2,000,000	1,605,981.57	80.30
Outcome 3	850,000	486,044.47	57.18
Outcome 4	105,000	61,661.85	58.73
Project Management	195,000	160,931.80	82.53
<b>Total</b>	<b>4,000,000</b>	<b>3,077,200</b>	<b>76.93</b>

The figures in Table 4 show that the total expenditures at the project operational closure reached US\$ 3,077,200 (about 77%) of the GEF grant and that none of the project outcomes used all their respective resource allocations in the project budget. Expenditures under the policy and legislative component (Outcome 1) and the demonstration of EE measures in buildings (Outcome 2) reached about 90% and 80% of the planned allocations, respectively, while the expenditures under each of the other two outcomes were less than 60%.



The data in Table 5 further show that the budget allocation on project management was less than 5% (4.9%) of the GEF grant, that is a modest allocation in line with the relevant policy on budgeting for GEF-funded projects. Actual expenditures from the GEF grant on project management reached only 82.53 % of the planned amount (about 4 % of the GEF grant).

Apart from the slow delivery in the initial years of the project, the above financial data indicate that a well-established financial management and control system was in place during the entire project implementation period, based on assistance of the UNDP CO Finance Office to the PMU.

The project was designed to attract co-financing from several stakeholders that belong exclusively to the national Government. No co-financing contributions were committed from the private sector and academic institutions. Planned amounts from the Project Document are taken further for analysis of the co-financing. Table 5 below compares the planned co-financing at the project inception with the actually realized co-financing at the completion of the project and Table 6 provides breakdown by sources and types of co-financing.

**Table 5: Co-financing table**

Co-financing (type/source)	UNDP (US\$)		Government (US\$)		Partner agency (US\$)		Total US\$)	
	Planned	Actual	Planned	Actual	Planned	Actual	Planned	Actual
Grants	125,000	171,793	28,391,760	37,499,920	-	3,629,355	28,516,760	41,301,068
Loans/Concessions	-	-	-	-	-	-	-	-
In-kind support	-	-	-	343,936	-	-	-	343,936
Other	-	-	-	-	-	-	-	-
<b>Totals</b>	<b>125,000</b>	<b>171,793</b>	<b>28,391,760</b>	<b>37,843,856</b>	<b>-</b>	<b>3,629,355</b>	<b>28,516,760</b>	<b>41,645,004</b>

**Table 6: Confirmed Sources of Co-Financing at TE Stage**

Source of co-financing	Name of co-financier	Type	Investment Mobilised	Amount (US\$)
Recipient Country Gov't	Iranian Fuel Conservation Company (IFCC)	Public Investment	Investment mobilised	19,654,997
Private Sector	Share of ESCOs reported by Iran Association of ESCO	Public Investment	Investment mobilised	771,896
Beneficiaries	Share of pilot buildings' owners in batch #1	Public Investment	Investment mobilised	261,341
Beneficiaries	Share of pilot buildings' owners in batch #2	Public Investment	Investment mobilised	1,407,382
Beneficiaries	Share of pilot buildings' owners in batch #3	Public Investment	Investment mobilised	379,998
Beneficiaries	Share of pilot buildings' owners in batch #4	Public Investment	Investment mobilised	726,059
Recipient Country Gov't	Tehran Disaster Mitigation and Management Organization (TDMMO)	Public Investment	Investment mobilised	8,941,054
Beneficiaries	University of Tehran	Public Investment	Investment mobilised	30,000
Recipient Country Gov't	Tehran electricity distribution company	Public Investment	Investment mobilised	8,903,869
Private Sector	Tehran Maskan Investment Company (share of low energy pilot buildings' owner)	Public Investment	Investment mobilised	52,679
Recipient Country Gov't	All agencies	Total in-kind	Investment mobilised	343,936
<b>Total</b>				<b>41,473,211</b>



It follows from the above tables that the total realised co-financing at the project completion exceeded the expected co-financing committed at the project inception by about 46% and stands at US\$ 41,473,211. A vast majority (almost 91 %) of the actually realised co-financing was provided by various agencies of the GoI, while the remainder was provided by the beneficiaries of the pilot demonstration projects and private sector entities.

The evaluators found that the co-financing from all listed sources was tracked down by the project team and reported with sufficient clarity. Contributions from external funders constituted an important factor of success in terms of the overall achievements of the project.

### **Monitoring and evaluation: design at entry and implementation**

For the assessment of the M&E framework, the evaluators reviewed some of the project documentation related to monitoring and reporting, including the Project Document, Inception Report, Annual Project Progress Reports (APPRs), as well as GEF Project Implementation Reports (PIRs).

#### *M&E design at project entry*

The Monitoring & Evaluation (M&E) Framework is in details described in Section 5 of the Project Document. It comprises of standard M&E items such as the Inception Workshop (IW), meetings of the PSC, annual Project Implementation Reports (PIRs), regular monitoring through site visits, the Mid-Term Review (MTR) and the Terminal Evaluation (TE).

The revised indicative budget of the M&E plan approved at the Inception Workshop (excluding the project team staff time and UNDP staff travel expenses) was US\$ 105,000, i.e. about 2.5% of the GEF grant that is considered very modest allocation for the project of this size and complexity.

The evaluators found the design of M&E framework well-articulated and in line with the standard M&E plan template for UNDP-implemented GEF-funded projects. The M&E plan in the Project Document did not specify the ways to involve and inform the GEF OFP about the project progress. However, this is implicitly addressed in the elaboration of the annual PIRs as the assessment of project progress is expected from the GEF OFP.

Overall, the evaluators found the M&E design adequate for monitoring the project results and tracking the progress toward achieving the project outcomes. Therefore, the M&E design is rated **Satisfactory (S)**.

#### *M&E at implementation*

The main subject of the discussion here is the implementation of the originally planned components of the M&E plan. For the assessment of the M&E framework, the evaluators reviewed some of the project documentation related to monitoring and reporting, including the Project Inception Report, Minutes of the Project Steering Committee, annual CDRs and annual Project Implementation Reports (PIRs).

#### Inception Workshop

As a standard practice of GEF projects, the Inception Workshop (IW) is conducted within a couple of months after the project signature by the recipient government with participation of



the full project team, relevant government counterparts, co-financing partners, the UNDP CO and representation from the UNDP-GEF Regional Hub. A fundamental objective of the IW is to build ownership of the project and its planned results by the key project stakeholders, approve the project's first Annual Work Plan (AWP), agree on the monitoring & evaluation work plan and budget, as well as to elaborate on the financial reporting procedures and obligations.

The Inception Workshop was held on 27 February 2017, about 7 months after the official project start, with participation of about 30 participants representing relevant stakeholders of the project. The workshop was held under the auspices of the VPST, the Secretary of the Committee for Energy Efficiency and Environment (CEEE) and the UNDP Deputy Resident Representative, UNDP. In addition to representatives of several ministries and affiliated agencies, there were also the UNDP RTA from the Bangkok Regional Hub (BRH), the project CTA, and representatives of consulting companies in attendance.

The Minutes of the IW included in the project Inception Report show that the IW fulfilled its purpose only partially. Apart from the very detailed presentation and discussion on the project design including substantive revision of the PRF matrix, there was no decision related to the establishment of the Project Steering Committee and on approval of the 1<sup>st</sup> Annual Work Plan.

#### Annual Project Reports/Project Implementation Reports (APRs/PIRs)

The most important instrument in the monitoring process were the UNDP Annual Project Performance Reports (APPRs) and the GEF Project Implementation Reports (PIRs). Both reporting instruments were prepared regularly with annual periodicity, however, with different periods covered and different purposes. The APPR is a part of oversight and quality assurance by the UNDP CO monitoring and project management. It is a self-assessment by the project management that serves two purposes, as input for the CO reporting process for the UNDP corporate Results Oriented Annual Reporting (ROAR) as well as a key input for discussion of the project progress by the PSC.

The Project Implementation Report (PIR) is an annual monitoring tool mandated by the GEF. It has become an essential management and monitoring tool for project managers and allows the UNDP/GEF unit to extract lessons from on-going projects.

Total 4 APPRs for calendar years 2018-2021 and 4 PIRs for GEF FYs 2018-2021 were reviewed by the TE team. While the APPRs cover calendar years (January-December), the PIRs are prepared for GEF fiscal years (July-June).

The PIRs were elaborated in a standard uniform structure and contain detailed reporting on progress towards performance targets at outputs, outcomes as well as the Project Objective levels. In line with the UNDP/GEF requirements, the PIRs are supposed to contain assessment and ratings of the progress by the PM, UNDP CO, the project Implementing Partner, the GEF OFP and the UNDP RTA. The actually given ratings in the annual PIRs are summarized in Table 7 below.



**Table 7:** Summary of PIR ratings by the project partners<sup>9</sup>

PIR Year	PM		UNDP CO		GEF OFF		UNDP RTA	
	DO	IP	DO	IP	DO	IP	DO	IP
2018	MU		MU	MU	-		-	-
2019	MS		MS	MU	MS		MS	MU
2020	S		MS	MS	MS		MS	MS
2021	-		MS	MS	-		MS	MU

The evaluators observed that the assessments of progress were provided by the PM, the UNDP CO, the GEF OFF and the UNDP RTA while there was no assessment by the project Implementing Partner (VPST) in any of the years. The ratings on progress to DO were found consistent by all partners while the ratings on IP were by default given only by the UNDP CO and the RTA.

The evaluators found the PIRs compliant with the standard UNDP/GEF project cycle reporting tools and particularly detailed. Apart from a large section on development progress provided by the Project Manager, the PIRs also contain concise summaries on implementation progress, management of critical risks, adjustments to project implementation plans and description of cross-cutting issues.

Site visits and on-site inspections were also part of the project M&E plan and were defined in the annual workplans. The site visits of the project team were documented in the Back-to-Office-Reports (BTOR).

#### Mid-Term Review (MTR)

The Project Document required the MTR to take place at the mid-point of project implementation (2 years after the start of the project) in order to determine progress made toward the achievement of the planned results, make assessment of efficiency and timeliness of project implementation as well as highlight issues requiring decisions and corrective actions.

Due to the sluggish start of the project the MTR was conducted 3 years after the project start by a team of one international and one national consultant. The MTR team conducted field mission to Iran on 31 August – 8 September 2019 and the MTR report was completed in October 2019. The details of the MTR are discussed in the section ‘Feedback from M&E activities’ below.

#### Terminal Evaluation (TE)

As a standard practice, Terminal Evaluations are conducted few months prior to the project completion date. The TE was commissioned by the UNDP CO in November 2021 and conducted in January-February 2022.

#### *Feedback from M&E activities used for adaptive management*

The primary feedback from the M&E activities was provided through the Quarterly and Annual Project Reports prepared by the Project Manager. Total 4 APPRs were prepared for the years

<sup>9</sup> DO = Development Objective Progress, IP = Implementation Progress



2018-2021 in a standard format following the UNDP Atlas Project Progress Reports (PPR) with updated information for each outcome as well as a summary of financial management of the project.

The Mid-Term Review (MTR) produced 7 recommendations. The guidance for undertaking Midterm Reviews (MTRs) of GEF-financed UNDP-supported projects requires that MTR recommendations are provided as succinct suggestions for interventions that are specific, measurable, achievable, relevant, and timely. However, the structure and content of the MTR recommendations are not in line with the commonly accepted evaluation standards<sup>10</sup>. In fact, the MTR recommendations are mixtures of findings, conclusions, and recommendations where the actual recommendation is not immediately and clearly visible. Also, some recommendations are rather vague in description of the required actions and none of the recommendations identifies the recipients expected to implement the recommendations.

In line with the standard procedures, UNDP as the implementing agency prepared a management response to the MTR recommendations in the form of an action plan on the MTR recommendations that was completed in November 2019. The MTR evaluation report was endorsed by the PSC at its meeting in February 2020.

The MTR recommendations with corresponding management response actions are summarized in Table 8 below.

**Table 8: Summary of MTR recommendations and management response**

#	Essence of the Recommendation	Management Response – Key Actions	Status
1	Addressing Implementation Delays and Project Revision	Building implementation approaches via a revised plan that is operationally viable, with revised timelines and budget allocations to meet fully project objectives	Completed
2	Coordination and Engagement with Relevant Stakeholders	Establishment of Technical Advisory Teams (TAT) of stakeholders Formal Stakeholder coordination to formalize trading market aspects and determine designated market maker Formal Stakeholder consultation on specification of energy savings obligation (bylaw amendment with penalties) Exit strategy/ reducing financial incentives	Completed
3	Pilots Initiatives and Market Mechanism	Pilot-2 <sup>nd</sup> , 3 <sup>rd</sup> and 4 <sup>th</sup> batches, Demo near zero energy building, Renovated EC, EC+ and EC++ demo building (preparatory activities, tender, issue of contracts, implementation and execution of work)	Completed
4	Energy Management Information System (EMIS)	Building energy ID (Establishment of the code and ID, beta testing, training and capacity building) Standardization of auditing and establishment of building typologies EEE market (Establishment of committees, implementation of associated activities)	Completed
5	Sequencing of Activities	Revised action plan with critical path of activities, sequencing, responsible actors and risk register Project stakeholders to define and agree from the outset the workflow, processes, procedures and roles and responsibilities for EMIS	Completed
6	M&E System and Project Finance	M&E Validation across EMIS and Pilots (preparatory work, implementation) Project Finance and risk register	
7	Sustainability and Capacity Building	Training and communication activities Study tour and conferences	

According to the status update at the UNDP Evaluation Resource Centre, a majority of the key actions have been completed before the operational closure of the project. However, as mentioned above, the formulation of the MTR recommendations was vague and not action

<sup>10</sup> Improved Quality of Evaluation Recommendations Checklist, United Nations Evaluation Group (UNEG), 2018



oriented. For example, Recommendation 2 that calls for coordination with relevant stakeholders, prompts also to identify lessons and complementarities with the parallel projects funded by JICA and the German Government. As can be seen from the table, the management response to this specific part of Recommendation 2 was not elaborated and links with the two parallel projects were not established.

The M&E Design, M&E Implementation and the overall quality of M&E is assessed separately on a six-point scale, as described in Table 9.

**Table 9:** TE rating on the Monitoring & Evaluation (M&E)

M&E design at entry	Satisfactory (S)
M&E Plan Implementation	Satisfactory (S)
Overall Quality of M&E	Satisfactory (S)

### *UNDP and implementing partner implementation / execution*

The legal framework for implementation of the EEEB project is the Standard Basic Assistance Agreement (SBAA) between the Government of Iran and UNDP. The project was designed for the National Implementation Modality (NIM) with the Vice Presidency for Science and Technology (VPST) as the national designated Implementing Partner executing the project on behalf of the Government of Iran having the following main responsibilities:

- Assumes full responsibility for the effective use of UNDP resources and the delivery of outputs stipulated in the signed Project Document;
- Reports on project progress against agreed work plans in accordance with the reporting schedule and formats included in the project document; and
- Maintains documentation and evidence of the proper and prudent use of project resources in conformity to the project document and in accordance with applicable regulations and procedures.

The actual implementation modality was NIM with UNDP support according to valid UNDP policy<sup>11</sup>. Under this arrangement, the UNDP CO in Iran provided implementation support through procurement of goods and services (equipment, international consultants) as requested by the PMU. Moreover, the UNDP CO maintained the oversight and management of the overall project budget, responsibility for monitoring of the project implementation, preparation of obligatory reports to GEF, and for organising mandatory evaluations.

As already mentioned, the signing of the Project Document was delayed by several years because of the UN sanctions in the Iran energy sector<sup>12</sup>. The lifting of the sanctions in January 2016 paved way to start of the project implementation. The following preparatory activities were carried out during the period between the signing of the Project Document and the Inception Workshop:

- The National Project Director was appointed in August 2016;
- The Project Management Unit (PMU) was in place as of November 2016;

<sup>11</sup>UNDP Programme and Operations Policies and Procedures: UNDP Support Services to National Implementation (NIM), 2015

<sup>12</sup> United Nations Security Council Resolution 1737 (2006)



- In November 2016, Committee for Energy Efficiency and Environment (CEEE) provided the PMU with office space of 600 m<sup>2</sup> along with furniture and internet connection in the Sharif Energy Research Institute (SERI);
- The Project Steering Committee (PSC) was formed to provide strategic guidance to the project implementation as well as an oversight function in relation to achievement of the project outputs and use of the project resources.
- Seven meetings of the PSC were held for review of the original Project Document and consider revisions necessary in light of the changed circumstances during the period 2010-2016

During the implementation of the project, the PSC convened about once per year, so the frequency of the meetings was less than prescribed in the Project Document. Also, the actual composition of the Steering Committee was to some extent different from what was envisaged in the Project Document as the membership was adjusted to better reflect the changed reality since the conception of the project.

The summary of the PB and TC meetings is provided in Table 10 below.

**Table 10:** Summary of PB and TC meetings

Name	Meeting dates
1	23 May 2017
2	8 July 2018
3	14 November 2018
4	9 July 2019
5	4 February 2020
6	23 February 2021
7	19 December 2021

A Project Management Unit (PMU) composed of the National Project Manager (NPM), Deputy National Project Manager (DNPM), Pilots Expert, EEEM Expert, EMIS Expert, Communication and Training Expert (CTE) and Finance Expert (F-E) Finance Expert and Project Assistant (PA) was established for day-to-day management and implementation of the project. However, the project faced staff turnover in the initial 2 years of the project. The first Project Manager, recruited in October 2016, resigned in December 2017. The position was vacant until the April 2018 when the 2<sup>nd</sup> PM was recruited. Both PMs were recruited through a competitive recruitment process but originated from academia circles and did not have sufficient experience from implementation of UN-funded projects. Moreover, they were reportedly engaged with their respective academic institutions in parallel with the EEEB project.

After resignation of the second PM, the project implementing partners appointed the third PM that just had completed similar duty for the GEF/UNIDO project Industrial Energy Efficiency in Key Sectors in Iran<sup>13</sup>.

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<sup>13</sup> Recruitment under the UNDP Fast Track Policy and Procedures



Furthermore, the National Project Director also changed with the current one is the advisor to the Vice President of Science and Technology. Last but not least, the original Chief Technical Adviser was involved with the project until the Inception Workshop and the replacement was recruited shortly before the MTR (in June 2019).

Overall, the recruitment for the project faced challenges in finding available qualified experts, due to the country's limited experience in the field of energy efficiency. Also, the long recruitment process was identified as a challenge by participants in interviews for this MTR.

In addition to the UNDP CO implementation support and quality assurance services, the UNDP rendered services of a Regional Technical Advisor based in the Bangkok Regional Hub (BRH) for technical oversight and backstopping of the project implementation. However, the original RTA that was involved in the project conception was replaced by the current RTA in early 2018.

Based on the above findings, the rating for the quality of UNDP Implementation/Oversight & Implementing Partner Execution is in Table 11 below.

**Table 11:** Rating for UNDP Implementation/Oversight & Implementing Partner Execution

Quality of UNDP Implementation/Oversight	Satisfactory (S)
Quality of Implementing Partner Execution	Moderately Satisfactory (MS)
Overall quality of Implementation/Oversight and Execution	Moderately Satisfactory (MS)

## **Project Results and Impacts**

### *Relevance*

The questions discussed under this section are to what extent is the project linked to Iran's international commitments in the field of climate change, the relevant GEF Operational Programme, the strategic priorities of UNDP in the country and the UN Sustainable Development Goals.

The EEEB project is in line with Iran's commitments under the United Nations Framework Convention on Climate Change (UNFCCC). Iran is the non-Annex I Party to the UNFCCC since it had ratified the UNFCCC in July 1996 and the Kyoto Protocol in August 2005. However, Iran has signed but not ratified the Paris Agreement, meaning its climate pledge remains 'intended'. In its Intended Nationally Determined Contribution (INDC) released in 2015, Iran pledges to reduce emissions by 4% (unconditional reduction) or 12% (conditional reduction) below the business as usual (BAU) scenario by 2030.

The project is well aligned with the national development priorities expressed in the 5<sup>th</sup> and 6<sup>th</sup> National Economic, Social and Cultural Development Plans (2011–2021<sup>14</sup>) that called for diversification of energy supply and promotion of energy efficiency. It is also aligned with the Law No. 1770 of 2011 on 'Energy Consumption Pattern Reform' that constitutes the most important document pertaining to energy efficiency in Iran.

<sup>14</sup> Because of COVID-19, the 6th NDP was extended for one more year. The 7th NDP is under development in 2022



The Law 1770 stipulates that energy intensity shall be halved till 2020 (with comparison to base year of 2011) with prioritizing improvement of energy efficiency and productivity, introduction of incentives and penalties for improving specific energy consumption (process & equipment), development of energy standards and labelling, and enhancement of awareness on energy efficiency and productivity. A whole chapter in the Law 1770 is dedicated to energy consumers in buildings and urban development sector which proves the importance of buildings on the country's energy sector policy. The Law puts strong emphasis on development of regulations and their strict and effective enforcement.

The project is also aligned with the GEF-4 Climate Change Focal Area Objective 1 that urges to promote energy-efficient technologies and practices in appliances and buildings, and GEF-5 Focal Area Climate Change Mitigation that puts emphasis on technologies that are commercially available but face barriers and require market pull to achieve widespread adoption and diffusion. Expected outcomes under Objective 2 of the GEF-5 focal area 'Promote market transformation for energy efficiency in industry and the building sector' include adoption and enforcement of appropriate policy, legal and regulatory frameworks, and mobilization of investments for energy savings and GHG reduction.

The project is also in line with the UNDP Country Programme for Iran (2017-2021), namely with its following elements:

*Outcome 1: Responsible government agencies formulate, implement and monitor integrated natural resource management, low carbon economy, and climate change policies and programmes more effectively*

*Output 1.2: Climate change adaptation and mitigation solutions developed and considered for adoption / implementation by the Islamic Republic of Iran*

*Target 1.2.3: Amount of CO2 equivalent mitigated and energy efficiency/ conservation achieved with a focus on industry and residential sectors*

Energy efficiency is also amongst corporate priorities for UNDP that has been working on energy efficiency for more than 25 years. Key UNDP services in the area of energy efficiency include policy and programme support to promote energy efficiency in households, public and municipal facilities, as well as residential and commercial buildings. UNDP is also supporting national and local governments to design and adopt efficient policies and legislation and help governments with integrated solutions that tackle energy efficiency in disaster risk reduction and recovery processes. Additionally, UNDP supports the implementation of business models and financing mechanisms to facilitate energy-efficient investment by private sector partners.

In relation to the UN Sustainable Development Goals (SDGs) of the 2030 Agenda for Sustainable Development, energy is being recognized as a key enabler for development through establishment of SDG Goal 7: *Ensure access to affordable, reliable, sustainable and modern energy for all*. Its indicator 7.3 calls to double the global rate of improvement in energy efficiency by 2030. Universal access to energy, a higher share of renewable energy and massive improvements in energy efficiency are now part of the top global priorities for sustainable development. In addition to direct relation to SDG7, energy efficiency is indirectly related to other SDGs as summarized in Table 12 below.



**Table 12:** Relation of energy efficiency to UN SDGs<sup>15</sup>

Sustainable Development Goals	Linkage with energy efficiency
<i>Sustainable energy</i>	
7.3 Double the global rate of improvement in energy efficiency	7a. Enhance international cooperation to facilitate access to clean energy research and technologies, including renewable energy, energy efficiency, and advanced and cleaner fossil fuel technologies, and promote investment in energy infrastructure and clean energy technologies 7b. Expand infrastructure and upgrade technology for supplying modern and sustainable energy services for all in developing countries
<i>Other SDGs:</i>	
8. Promote sustained, inclusive and sustainable economic growth, full and productive employment and decent work for all	Energy efficiency and conservation influence the country's energy intensity and carbon content of economic growth
9. Build resilient infrastructure, promote inclusive and sustainable industrialization and foster innovation	Resilient infrastructure and public-private partnerships are required to ensure access to energy for all and to maximise energy efficiency
11. Make cities and human settlements inclusive, safe, resilient and sustainable	Municipalities require careful electricity planning and efficient power distribution
12. Ensure sustainable consumption and production patterns	The residential and buildings sector is a key part of a future in which there is sustainable consumption of energy and products
13. Take urgent action to combat climate change and its impacts	The carbon-intensive energy sector (based on fossil fuels) is a key driver of climate change.

Based on the above, the relevance of the project for the recipient country, as well as the donor and implementing agencies is rated **Relevant (R)**.

### Progress towards objective and expected outcomes

The information presented in this section was sourced from the various EEEB project implementation reports and verified with information collected through interviews with key project informants. Additional sources of information were various studies and technical reports produced by the project. The list of documents consulted is provided as Annex 4 to this report.

The principal questions to be discussed in this section are whether and how the EEEB project outcomes as well as its objective have been achieved. Eventually, the further text also highlights positive and negative, foreseen and unforeseen changes and effects induced by the project interventions.

In the series of tables below, the EEEB project results are summarized and compared against the target indicators listed in the project's logical framework. The initial information about the EEEB project results/achievements was extracted from the project's progress reports and verified and updated through interviews held during the data collection phase. Additional information was supplemented from the project-related documentation (such as consultants' technical reports, capacity building reports, etc.) provided by the PMU.

Tables 13 – 16 list the indicator targets for the individual results, summarize the delivery status at the Terminal Evaluation and provide rating for the individual project results' delivery. Each table contains a summary of the actually achieved project results in a bullet points format. The

<sup>15</sup> Compiled from Transforming our World: the 2030 Agenda for Sustainable Development (UN, 2015), Indicators and a Monitoring Framework for the Sustainable Development Goals, Sustainable Development Solutions Network (SDSN)



tabular summary is followed by a short narrative text with additional insight and details on how and why the results have or have not been achieved. At the end, the narrative also explains the basis for rating of individual project outcomes. By this token, the text following each table summarizes the main facts related to the project results that could not be captured in the tables but were considered important for the justification of the rating of the project outcomes.

**Table 13:** Deliverables for Outcome 1

Indicator	EOP Target	Status of Deliverables at TE
<b>Outcome 1:</b> Key laws, policies, strategies, regulatory documents, frameworks, and studies are approved by Iran supreme energy council and in place to provide overall national direction for the cost-effective CO2 mitigation/building EE measures and facilitation of cross-sectoral coordination and coherence for improved enforcement under the MEEE framework		
Number of MEEE policy documents prepared	1	Execution instruction for implementing by-law on Energy Efficient And Environment Market prepared
Number and scope of policies and innovative models on reducing air pollution on all populations, formulated, adopted, implemented	2	N.A. (the MTR advised the indicator is not relevant to the scope of the project)
<b>Output 1.1:</b> A completed review of EEEB policies, legislation, standards and regulations and proposed action plan for improving compliance enforcing procedures		
Number of policy updates for enhancement of EE policies, laws, regulations, and standards to ensure improved EE in building sector	2	4 policies updated as follows: 4th revision of Article19 of the NBC completed and endorsed Revision of 2 energy labelling standards on residential and non-residential buildings (#14253 and #14254) completed and submitted for approval Execution instruction for implementing the by-law on the Energy Efficiency and Environment Market (EEEM) endorsed
<b>Output 1.2:</b> Proposed enforcement system for energy efficiency and environment buildings code (EEBEC) implementation		
No of developed EE code enforcement system	1	1 enforcement system of the revised Article 19 developed including requirement of EPC for public buildings 1 checklist for design and construction of new buildings developed and submitted for approval
No. of reference test laboratories properly equipped and trained to certification of EE building products	1	1 laboratory upgraded (equipment procured and training provided for the building reference laboratory at BHRC)
<b>Output 1.3:</b> Energy Management and Information System (EMIS) for buildings established and operational		
Number of buildings connected to EMIS and using energy management practices	300	(At least 575 buildings connected to the EMIS (175 new buildings and more than 400 existing buildings))
<b>Output 1.4:</b> A Cross-Sectoral Strategy and Action Plan (CSSAP) for energy efficiency in building sector inclusive of EEE market (MEEE) mechanisms established, implemented and monitored		
No. of EE certificates generated for sale on EEEM (#Million certificates)	30	N.A. (the indicator is not relevant) <sup>16</sup>
No. of EEEB projects facilitated, implemented, and monitored under the CSSAP	300	More than 575 buildings (175 newly constructed and 400 existing) connected to EMIS
Number and scope of policy tools adopted and used to reduce energy consumption	3	3 policy tools developed and used as follows: Energy Performance Contracts template developed and approved MR&V (Monitoring, Verification and Reporting) framework developed and approved Energy efficiency certificate scheme finalized

<sup>16</sup> The indicator was removed from the PRF in the project's Inception Report because the project has the capacity to issue the EE certificates for the pilot buildings only and does not have a mandate to implement the MEEE market and generate EE certificates for other buildings.



**Output 1.1: A completed review of EEEB policies, legislation, standards and regulations and proposed action plan for improving compliance enforcing procedures**

The 4th revision of Article 19 of the National Building Code (NBC)<sup>17</sup> was completed in September 2019 in cooperation with the Road, Housing and Urban Development Research Centre (BHRC). After review by relevant professional bodies, it was officially approved by the Ministry of Road and Urban Development (MoRUD) in August 2020. The revised Article 19 distinguishes four different ratings and related criteria for newly constructed buildings, namely 1) energy compliant (EC) building; 2) EC+ building; 3) EC++ building and 4) nearly zero energy building (nZEB).

Revision of the national standards of building energy performance (labelling) based on the national standard system was conducted in contract with the Iranian National Standard Organization (INSO). A study on energy labelling standard for residential buildings (Standard 14253) was completed in November 2020. Also, revision of the national energy labelling standard for non-residential buildings, (Standard 14254) was conducted in close collaboration of INSO, IFCO, the Renewable Energy and Energy Efficiency Organization (SATBA) and BHRC.

The revised standards were pilot tested for determination and calculation of energy labels for 100 residential and 51 public buildings. The results were submitted to the Technical Committee of Standards. Official endorsement of the revised standards is expected in early 2022.

The project also assisted with development of an execution instruction for implementing the by-law on the Energy Efficiency and Environment Market (EEEM) which was endorsed by the Energy Saving Commission under the Supreme Energy Council. In March 2021, a new financial tool for Energy Saving Certificates was prepared and approved by the Iran Exchange Supreme Council. By this token, the project provided important assistance for implementation of the EEEM that is critical for long term sustainability of the EEEB project results as it is intended to introduce financial incentives for achieving energy savings.

**Output 1.2: Proposed enforcement system for energy efficiency and environment buildings code (EEEBC) implementation**

Following the approval of the revised Article 19, the project supported development of a checklist for design and construction of new buildings for practical implementation of Article 19. The final version of the checklist was developed by an authorized committee in July 2021 and official approval by MoRUD was expected in early 2022.

Also, the project supported procurement of equipment for the building reference laboratory at BRHC, including data loggers & stations, sensors for measurement of heat flow and thermal emissivity of glasses, a thermal camera, and a pyranometer. The procured equipment and associated actions will ensure control of compliance with the requirements of the revised Article 19 through more accurate data gathering on building facade measurement and monitoring of heat losses.

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<sup>17</sup> The first version of the National Building Code was approved in 1991 and its implementation has been obligatory in public and private buildings. The last revision prior to the EEEB project was in 2010.



As a support for enforcement of the Article 19, the project organised a series of 8 training courses on inspection of compliance with the new version of Article 19 and the building energy simulation programme for about 557 registered engineers and assessors of the Iran Construction and Engineering Organization (ICEO) all over the country. Furthermore, over 130 assessors from the Iran National Standard Organization (INSO) and associated private inspection companies received training through 7 courses on how to implement and enforce the new revision of the two energy labelling standards for residential and non-residential buildings.

The enforcement of the revised energy conservation building code (Article 19) and the energy labelling standards for residential and non-residential buildings is based on the endorsed document by Council of Ministers from 15 November 2021 that outlines the enforcement actions as follows:

- As of 23 March 2022, municipalities are responsible to issue the rating system according to the revised Article 19 for new buildings that sets an obligation that all types of new buildings owners to receive the Article 19 rating before issuing occupation permit.
- As of 23 March 2023, it will be mandatory to present the Energy Performance Certificate under the labelling system for all public buildings. Buildings unable to get a label on basis of the EPC will face 30% increase of the price for gas and electricity.

**Output 1.3: Energy Management and Information System (EMIS) for buildings established and operational**

Development of the EMIS was outsourced to a company nominated through a competitive tender process in early 2019 as a part of development of the Building Energy Identification Platform (BEID) - a web-based platform for checking the national Building Energy code over the design and construction steps of new buildings. The BEID platform includes the EMIS which is a software tool that connects processes of entering data on buildings and their energy consumption, monitoring indicators and reporting amount of energy saving for certification and market purposes.

The BEID platform is hosted by the BHRC. The EMIS comprises two modules – the first module serves for adoption and enforcement of the Article 19 for new buildings while the second module supports issuance of energy labels in line with the revised national energy labelling standards for existing buildings. Its full operation will also support establishment of energy efficiency and environment market through recording Energy Efficiency Certificates.

For pilot testing of the EMIS in 2020, ten existing buildings equipped with smart metering of water, electricity and gas were connected to the system. In addition, data from more than 200 pilot buildings were inserted into the system based on the energy bills. The data inputs via smart metering and bills information were checked with the aim of development of optimal strategy for inserting national building data into the EMIS system.

The opening ceremony for the BEID/EMIS platform was held on 21 October 2020 with participation of high-level representatives of several project stakeholders (MoRUD, VPST, Mayor of Tehran, Energy Commission of the Parliament, UNDP Resident Representative).



The EMIS platform covers the energy related information from both new and existing buildings and enables the following:

- Continuous updating and maintenance of a database of general information on public and private buildings;
- Continuous entry and monitoring of consumption data for all types of energy in buildings;
- Calculation of consumption indicators by user-selected independent variables entered in the database data and via present parameters;
- Monitoring and target setting for energy expenses and energy saving for individual buildings and groups of buildings;
- Report creation according to user preferences or according to preset templates.

At the time of the TE, newly constructed building blocks from the pilots of low energy including 175 units together with information from about 400 existing buildings were connected to the EMIS platform in collaboration with Municipality of Tehran.

**Output 1.4: A Cross-Sectoral Strategy and Action Plan (CSSAP) for energy efficiency in building sector inclusive of EEE market (EEEM) mechanisms established, implemented and monitored**

A comprehensive CSSAP was completed based on the results and experience of the pilots, EMIS training needs and feedback from communication programmes, based on the following elements:

- Fully developed EMIS supported with training including a building energy passport (ID);
- EPC model including a Monitoring, Reporting and Verification (M&V) framework, and Energy Performance Contract (EPC) template;
- A certification scheme for energy efficiency;
- ESCO business models

The CSSAP will be presented in the project final report as a pathway and suggestions for promoting energy efficiency in building to the policy makers and key stakeholders.

The EEEM by-law was promulgated to initiate structural changes in the energy market of Iran. The project provided support for development of the following two studies:

- Cost Benefit Analysis (CBA) as a method of quantifying socio-economic benefits of energy efficiency along with energy benefits and enhancing awareness and engagement of all relevant stakeholders.
- Monitoring, Reporting and Verification (MR&V) framework as a technical toll for objective confirmation of GHG emission reductions through implementation of the EEEM. The MRV study conducted under the project ensured availability of work instructions for implementation of the MRV framework and confirmation of energy savings and carbon dioxide emission reductions as a necessary condition for issuance of the white certificates (EPCs);



**Overall Assessment of Outcome 1:** Several interviewed stakeholders emphasised the fact that the EEEB project assistance was important for timely revision of the relevant regulatory instruments on building energy efficiency. Component 1 of the EEEB project for the revision of the Article 19 of the NBC concurred with the BHRC plan for the revision of the NBC Article 19 (the last revision was in 2010). The EEEB project assistance provided additional financing for the restricted BHRC budget the 4th revision and thus enabled a more thorough revision. It also made available international expertise and allowed the current revision to be based on comparison of building codes from 10 countries. In comparison with the 2010 revision that comprised two building design methods, the actual revision, based on the concept of the national building code in India, comprises 4 different design methods that, amongst other things, changed the rules about design of the building envelope, through definition of optimum values cleared the previous ambiguity of the design of windows, and put more focus on energy consumption in the buildings.

Similarly, the work under Component 1 was timely for the plans on revision of the two building energy standards for existing buildings that is required with 5-year periodicity but the last revision was completed about 10 years ago.

Despite the official promulgation of the revised Article 19, its effect is currently marginal as a majority of the newly constructed buildings are constructed at the lowest (EC) rating category ensures compliance with the revised Article 19 and thus guarantees issuance of the occupation permit by competent municipalities. Although the Government provides limited financial incentives in the form of discounts for utility connections of higher category (EC+ and EC++) buildings, these are not sufficient to ensure a higher share of EC+/EC++) newly constructed buildings.

Despite the ambitious objectives of the revised Article 19, the building construction industry delivers a majority of new building in the lowest (EC) rating category that ensures compliance with the revised Article 19. This is a combined effect of persisting subsidies on energy prices and insufficient financial incentives for construction of higher level (EC+ and EC++) buildings. Consequently, it has a negative implication on development of market with quality insulation materials that is a necessary and required condition for faster promotion of energy efficiency in buildings. As a consequence of low demand for high quality of insulation materials, their local production is low or even non-existent, although there are several factories in Iran capable of producing such materials.

The project made necessary institutional arrangements for effective energy monitoring through a national platform of integrated building data monitoring and building energy identification system (EMIS-BEID).

The second major achievement of Component 1 is the development and operationalisation of the Energy Management Information System (EMIS) platform. For the first time a digitalized platform has been developed and made available to the Government for monitoring of energy consumption and efficiency in the building sector. It is expected that the EMIS platform will play a key role as a digitalized infrastructure for a full functionality of the energy efficiency market.



In the initial phase of the EEEB project, there was an unresolved issue about ownership of the EMIS platform that was persisting until the MTR stage when this challenge was highlighted in the MTR report. The recently approved legislation on energy efficiency in buildings stipulated responsibility of the BHRC for development and maintenance of such platform. Therefore, a decision was taken that BHRC hosts the BEID/EMIS platform.

Despite the successful launching, operation of the BEID/EMIS platform was at a piloting stage at the time of the TE as it covers only a few hundreds of buildings under the auspices of the Tehran Municipality. The functioning is facing two major challenges. Firstly, replication and upscaling of EMIS to other municipalities will require substantive investment into hardware in terms of servers, connection lines, etc. Secondly, it will also require on-line uploading data about gas and electricity consumption in buildings that are in possession of organisations belonging to the Ministry of Petroleum and the Ministry of Power.

The studies on legal and regulatory framework for establishment of energy efficiency and environment market provided a general guidance for development of required regulatory, legal, and financial frameworks and models as well as for executing instructions for establishment and implementation of the EEEM in the form of Energy Performance Contracts.



**Table 14: Deliverables for Outcome 2**

Indicator	EOP Target	Status of Deliverables at TE
<b>Component 2: Pilot installations of EE and RE measures in existing building stock</b>		
CO <sub>2</sub> emission reduction from implemented EE pilot projects at demo buildings	1 Mton CO <sub>2</sub> emission reductions cumulatively from pilots in existing buildings (Up to 10 years after project completion)	Energy efficiency projects implemented in 541 pilot buildings including 362 residential building with 3,000,000 m <sup>2</sup> and 179 non-residential buildings with 723,000 m <sup>2</sup> . Annual final energy saving including 7,378,650 NM <sup>3</sup> natural gas and 13,104 MWh electricity. The 10-year cumulative CO <sub>2</sub> emission reductions will reach to 248.99 kton CO <sub>2</sub> .
Number of new technologies adopted and scaled up that support more efficient energy use	6	14 types of EE and RE technologies identified based on the Investment Grade Energy Audits (IGEA), and also deployed and adopted throughout the pilot projects
Amount of CO <sub>2</sub> equivalent mitigated and energy efficiency/ achieved with a focus on residential sector	100 kt CO <sub>2</sub>	The deployment of energy efficiency measures across 362 residential pilot projects has resulted in annual saved energy with the source of natural gas and electricity 3,770,150 (Nm <sup>3</sup> ) and 4,040,470 (kWh), respectively. Equivalent to the 10-year cumulative CO <sub>2</sub> emission reductions will reach to 248.99 kton.
<b>Output 2.1: Business model for installation of SWH systems and their integration with other building energy conservation measures successfully piloted</b>		
No. of successful ESCO business model-designed, engineered, installed, operated and maintained EEEB demo projects	1	Two ESCO business models; guarantee-based (for non-residential buildings) and shared-based (for residential buildings) energy saving were operated through deployment of pilot projects
No of demonstration pilot of heating-cooling insulation building with an integrated fossil-base and renewable energy system consists of CCHP, BEMS and SWH technologies	8	The heating-cooling insulation building with an integrated fossil-base and renewable energy system consists of CCHP, BEMS and SWH technologies have been implemented and demonstrated in the 22 demonstration pilots.
<b>Output 2.2: Approved follow-up actions for the widespread application of completed demonstration projects showcasing successful applications of EEEB technologies (including SWH), techniques and practices in the residential and non-residential buildings in Iran</b>		
No. of buildings completed and operational pilot projects	300	The total number of completed and on-going pilot buildings respectively reached to 532 and 9.
No. of policy for scaling up and replicate demonstration projects is in place	1	A draft scaling up policy and EMIS have been developed by EEEB project which needs further approval and developments.
<b>Output 2.3: Developed and disseminated technical guidelines and training materials based on the results and evaluation of EEEB demonstrations.</b>		
No. of EEEB guidebooks and training materials developed and disseminated	10	Nine guidebooks and 5 booklets have been developed and disseminated between key stakeholders, university students, and trainees.

### **Output 2.1: Business model for installation of SWH systems and their integration with other building energy conservation measures successfully piloted**

ESCOs started to work by 2001, and the Iran Association of ESCO established in 2010 with 40 members who are the companies provide energy services and supply energy technologies and equipment including motor-house smart control, heating-cooling smart systems, magnetic removal sediments, lighting, BMS and automation. The total number ESCOs who are certified by PBO are 25, which 9 number out of 25 ESCOs directly collaborated with the EEEB project.



The Iran Association of ESCO and ESCOs themselves have had a big role in designing and operating of business models and pilot projects.

In partnership with the Iran Association of ESCO, building owners and other stakeholders, the EEEB project designed and implemented two ESCO business models, namely the guarantee-based and shared-based models, through deployment of energy efficiency measurement in the pilot projects. The guarantee-based model was used for non-residential buildings and the shared-based model was applied for residential buildings.

The participating ESCOs analysed the energy consumption in the pilot buildings and recommended the most appropriate and best cost-benefit EE options for the further review and agreement by the building owners. The relevant EE deployment cost under the guarantee-based model was fully supported by the EEEB project. In the share-based model, the project supported about 50% of the costs and the remaining part of the cost was paid by the ESCOs. The building owners' portion was reimbursed to ESCOs from the achieved energy savings. The share-based business model was implemented for the first time in the country and mobilised more than US\$ 726,000 from 316 out of 362 residential building pilots.

The piloting of these two initiatives provides new revenue streams for ESCOs in Tehran and provides new opportunities to trial 'energy as a service' in the Tehran energy efficiency market. As an example, in some of the non-residential pilots including Municipality Office in District 3, Elm Sanaat University and Refah Chain Store, the financial investment of building owners may increase upon successful completion of the pilots and the building owners try to deploy more cost-benefit EE technology options without the EEEB project support, in close consultation and collaboration with the ESCOs.

As discussed, the share-based model motivated residential building owners to contribute to financing energy efficiency projects and facilitated implementation of EE technologies and energy efficiency measurements in the buildings. However, there are some risks of loss for ESCOs due to the devaluation of the national currency, increased inflation rate, economic insecurity, and delays in reimbursement of the building owners' portions to the ESCOs. Thus, some modifications of the share-based business model would be desirable, e.g. that the GoI buys the saved energy from ESCOs with the real energy price through the energy efficiency and environment market (EEEM) or stock market in future.

Conducting Investment Grade Energy Audit (IGEA) in the first 10 demonstration buildings provided a long list of energy efficiency measures and technologies for the building sector. The aim of this study was to identify and calculate cost-benefits of applicable EE and RE measures and technologies with focus on deeper and more innovative measures based on the EE market in Iran. It also provided data and information that supported the EEEB project to take a right approach in initiating the pilot projects. As a result, the heating-cooling insulation building with an integrated fossil-base and renewable energy system consists of CCHP; BEMS and SWH technologies have been implemented and demonstrated in the 22 pilots including CCHP system in 4 buildings; SWH system in 14 buildings; and BEMS system in 4 buildings. By implementing these projects, 25% energy saving and improvement in the associated indicator (from 277 to 208 kWh/m<sup>2</sup>. year) were achieved.



The National Consultant visited one of the above pilots, for which EEEB project and Disaster Management Organization of Municipality of Tehran agreed on deployment of a 25 kW on-grid solar photovoltaic system, a 5 kW off-grid solar photovoltaic system and a solar water heater system in each of the eight Disaster Management Sites in Tehran. The relevant equipment was supplied from JGH Denmark but 5 out of the above 8 sites were not completed at the TE stage due to the limited time, unsuitable roof material for installation of the solar panels, delays in importing the relevant equipment from Denmark (off-grid batteries) and complicated process for securing confirmation by the Iranian Electricity Distribution Company. Consequently, for future it would be recommended to purchase the same or similar equipment from the domestic market and deploying a hybrid system instead of separate off-grid and on-grid systems. Also, based on successful completion of this initiative, Municipality of Tehran may upscale the interventions in one building in each of the 22 Tehran districts.

**Output 2.2: Approved follow-up actions for the widespread application of completed demonstration projects showcasing successful applications of EEEB technologies (including SWH), techniques and practices in the residential and non-residential buildings in Iran**

As the standard non-residential and residential buildings were not defined in the Project Document and the Inception Report, the standard buildings were defined after the MTR in consultation with the PSC members. For the case of non-residential and residential building, the defined standard areas are equal to 500 square meters and 5,300 square meters, respectively. Further, in order to attract participation of more buildings, the project has widened the scope of interventions by adopting the following requirements: 1) No restriction to the type of building; 2) No restriction to the type of EE measures including electrical saving measures; 3) Attracting the interest of the public through awareness campaigns held initially in three large cultural houses of Tehran municipality and later in additional 12 houses; 4) Focusing on building complexes that have a larger number of units.

The total number of completed and on-going pilot buildings reached 532 and 9, respectively, and with involvement of key stakeholders including IFCO, SATBA, Municipality of Tehran, BHRC, ESCOs and Iran Association of ESCO. The 14 types of EE and RE measures were randomly been implemented in these buildings. The amount of following results on energy saving has been calculated by International Protocol for Measurement and Verification of Performance (IPMVP) methods as well as regular measurement and monitoring of data in each pilot.

- There were 362 adopted EE measures in residential pilot buildings with total area around 2,990,000 m<sup>2</sup>. The amount of annual saved energy with the source of natural gas and electricity were 3,770,150 (Nm<sup>3</sup>) and 4,040,470 (kWh), respectively.
- The total number of adopted EE measures in non-residential pilot buildings has been 170 with total area around 732,162 m<sup>2</sup>. The amount of annual saved energy with the source of natural gas and electricity were 3,608,500 (Nm<sup>3</sup>) and 9,063,475 (kWh), respectively. The data and results on average 3-year energy consumption in 51 numbers out of 170 non-residential pilots were used by IFCO, INSO, NIOC, SATBA and EEEB project for testing of the new labelling standards 14253 and 14254 on the ground. As a



result, 75% out of 51 tested buildings not get labels and labeling standards' bugs were discovered, revised and are under final review and ratification.

- The on-going pilot projects include on-grid photovoltaic (PV) and off-grid PV systems in 9 buildings (eight buildings of Tehran Disaster Management and Mitigation Organization (TDMMO) and one pilot of innovation center of the University of Tehran). The total capacity of PV systems will be 375 kW (On-grid systems: 330 kW and off-grid systems: 45 kW) and the expected amount of annual green energy generation will be 650,000 kWh/yr.

The total amount of annual natural gas and electricity savings and energy generation achieved so far were 7,378,650 nm<sup>3</sup> and 13,103,950 kWh respectively; equivalent to the annual primary energy saving of 125,779 MWh and 51,980 barrel of oil equivalent. The total amount of annual CO<sub>2</sub> emission reduction was 24.889 Kton. Implementation of pilot projects has resulted not only in reduced energy consumption and carbon emission reduction, but also in structuring the framework for further sustainable business development in the ESCO market and scaling up of EE and RE technologies. Full functionality of the EEEM will be occurred if the updated Article 19 and labelling standards be in place and enforced, and the capacity of key stakeholders will be developed as well.

A draft scaling up policy and EMIS was developed that needs further approval. Several measurement and verification (M&V) equipment and tools were supplied and delivered to four cooperation research centres/universities in Tehran including BHRC, Vocational and Technical Training Centre, Sharif University of Technology and Amir-kabir University. These laboratories can be considered as national measurement and verification centers for promoting the mechanical, electrical, indoor environment quality and renewable energy efficiency measurement in the building sector.

**Output 2.3: Developed and disseminated technical guidelines and training materials based on the results and evaluation of EEEB demonstrations**

EEEB project with collaboration of the Iran Association of ESCOs conducted the need assessment on EE skills and training in the country, and designed the educational curricula, and training materials. As a result, 9 guidebooks and 5 booklets have been developed on the following topics, and disseminated between key stakeholders, university students, and trainees:

- Energy efficiency and management in building;
- Building energy management system (BEMS) and smart control system of boiler-house;
- Thermal and electrical energy audit in building (Investment grade energy audit);
- Updated energy building code (code 19th);
- Application of Energy monitoring information system (EMIS);
- Building energy simulation software;
- Building energy labeling and successful case studies in developed countries;
- Low energy materials in buildings design and construction;
- Carbon trading and energy efficiency certificates;
- Energy efficiency measures in buildings;



- Monitoring, Verification and Reporting (MRV) and Greenhouse gas emission inventory development;
- Building simulation software – Energy;
- Conceptual model of the market for energy efficiency and environment; and ESCO business models.

Several project stakeholders interviewed during the TE emphasized the necessity of continuing the EE relevant training on a number of topics, including Code 19, international EE best practice and technologies, EE rating and labelling, EE auditing, BEID/EMIS, EE simulation and modelling; EE deployment; M&V equipment and tools, web-based software for energy monitoring; Smart system installation and application for the following target groups:

- Inspection companies and engineers working with ICEO, INSO and municipalities;
- Policy makers and development planners;
- EMIS operators and inspectors;
- ESCOs and building, mechanical and thermal energy experts and technicians;
- Power house supervisors and workers; EE Suppliers; Building developers and managers., and some of them including INSO, IFCO, Municipality of Tehran, ICEO, BHRC, TVTO, Association of ESCO, EE laboratories of the Amirkabir University of Technology (AUT) and the Sharif University indicated that they may have budget or technical capacity and equipment to conduct some of these trainings.

## **Overall Assessment of Outcome 2:**

Energy efficiency pilot projects were implemented in 541 pilot buildings including 362 residential building with 3,000,000 m<sup>2</sup> and 179 non-residential buildings with 723,000 m<sup>2</sup>. The deployment of energy efficiency measures across 362 residential pilot buildings resulted in estimated annual energy savings of 3,770,150 Nm<sup>3</sup> natural gas and 4,040,470 kWh electricity. The amount of saved energy resulting from the 179 non-residential buildings were 3,608,500 (Nm<sup>3</sup>) and 9,063,475 (kWh), respectively. There is a potential for even higher savings in governmental building pilots that could be realised through further developing the capacity of governmental staff and deploying different EE measurements for permanent and temporary spaces in the buildings.

The project supported conduct of Investment Grade Energy Audits (IGEA) in 10 demonstration buildings with the aim to identify and calculate cost-benefit of applicable EE and RE measures and technologies with focus on deeper and more innovative measures based on EE market in Iran. This work resulted in selection and deployment of 14 specific types of EE and RE technologies throughout the pilot projects.

Due to the limited budget and time, the EEEB project decided to deploy the above EE and RE measurements which at the maximum saved energy about 25 % and identified a potential for supporting start-up companies for developing the ideas on more effective EE/RE measures. The pilots were implemented with the ESCOs that identified more effective EE and RE solutions but could not deploy these technologies as their contracts with EEEB project included only selected EE and RE technologies and were thus inflexible. On the other hand, the upfront cost for deployment of EE/RE technologies was found to be an issue especially for the



residential building owners who cannot afford to pay these costs. Also, building developers reported that construction of lower energy buildings (EC+, EC++ and Near Zero buildings) requires much more investment and hence is currently not profitable.

The activities under this project component resulted in development and practical implementation of two ESCO business models, namely guarantee-based and shared-based models for energy service performance contracting, as well as formation of an energy efficiency supply chain for the 14 applicable and feasible technologies. These are key requirements for energy efficiency market development, and it is expected that the practical experience gained under the pilot projects will facilitate further adoption, promotion and scaling-up of these technological measures.

**Table 15:** Deliverables for Component 3 - Implementation of market transformation strategies

Indicator	EOP Target	Status of Deliverables at TE
<b>Outcome 3:</b> MEEE promoting ESCOs to nationwide transformation of construction techniques for a thermally insulated building shell and reduced heating loads as well as improved behaviour and attitude of building owners and administrators towards energy use in buildings		
No. of Training centres for EEEB practitioners established	1	TVTO Shahid Sohi Centre equipped and inaugurated as the EE training centre
Number of new partnerships for EE policy implementation	2	4 formal partnerships formed through signed MoUs with the BHRC, Sharif Energy Research Institute TVTO, and Amirkabir University of Technology Informal partnerships with INSO, IFCO, SATBA, ICEO and Tehran Municipality
<b>Output 3.1:</b> Operational and continuing capacity development programs, and local EEEB accredited professionals		
Developed training program in place	1	A training programme of 28 training modules in 4 categories
Number of ESCO companies engaged in EE certificate model implementation	10	9 ESCO companies engaged
Number of training courses delivered	20	24 training courses for ESCOs, energy engineers and graduates, 24 virtual training events for students
<b>Output 3.2:</b> Continuing public awareness-raising program on EEEB developed and implemented		
Level of public awareness about EEB in different target group	Public awareness tripled	No data available
No. of public awareness campaigns about EEB for different target groups	5	5 public awareness campaigns in 2019-2021
Number of NGOs engaged in promoting sustainable energy use to households	3	3 NGOs engaged
<b>Output 3.3:</b> Sustainable financial schemes for EEEB established and are functional		
No. of established and operational financial schemes	2	No financial schemes operational
No. of local and international financial institutions providing financing for EEEB project	2	No financial institutions provided financing

The project engaged in 4 formal partnerships through signed MoUs with the BHRC, Sharif Energy Research Institute, TVTO and AUT. In addition, informal partnerships were established with the INSO, IFCO, SATBA, ICEO and Tehran Municipality.

For operationalization of the energy efficiency market, the project provided assistance for development of relevant legal and regulatory frameworks:

- Executive instruction for the EEEM
- EE certification scheme
- M&V framework of the building sector and structure of the Energy Performance Contract (EPC) - developed in close co-operation with IFCO and SATBA.



The above legislative tools were submitted to the Energy Saving Commission and approved by the Supreme Energy Council in May 2021.

The endorsement of the EEEM framework by the Supreme Energy Council gives a green light to implementation of the EEEM. However, the definition of a stock symbol for the Energy Efficiency Certificates as a final element of the EEEM framework was still in progress at the time of the TE in coordination with the IRANEX.

**Output 3.1: Operational and continuing capacity development programs, and local EEEB accredited professionals**

In September 2018, the project signed an MoU with the Technical and Vocational Training Organization (TVTO) for implementation of the capacity development part. Under the MoU, the TVTO conducted a training needs assessment study and developed a comprehensive training programme that was implemented in the following components:

- Capacity building on enforcement of EEB laws and regulations for government and public stakeholders (11 training courses for over 678 trainees);
- Technical training modules on various topics related to carbon and energy efficiency markets for ESCOs, energy engineers and graduates (16 training events for total 1,506 participants);
- Virtual training to students and youth (about 140 minutes of various multimedia products, including 9 animations, 6 motion graphics and 7 podcasts);
- Practical training by ESCOs on operation and maintenance of EE measures in buildings (8 training courses for total 653 trainees)

The technical trainings included a series of webinars for energy start-ups with subject topics including sustainable building and climatic design, demand management and behavioural economy, powerhouse and innovative energy services systems, application of monitoring of HVAC system in energy efficiency, and renewable energy and hybrid systems in buildings. The webinars had the objective to develop new energy businesses and start-up companies in order to fill gaps in technical capacities on energy efficiency services. In addition to the training events, the project also produced 22 short EMIS training videos of 150-minute total duration.

Facilitators of the training courses used the pre-test/post-test method for effectiveness evaluation of the training courses. The results of the evaluation in three main target groups from the BHRC, ICEO and ISO showed the increased level of knowledge and skills between 13 and 70% (average 41.7%).

The training needs assessment study also identified a list of equipment required for establishment of a training centre on energy efficiency in buildings. Several training centres connected to the TVTO in Tehran province were assessed with the aim to identify the best centre for vocational training. The TVTO Shahid Sohi Centre was designated as a centre for a comprehensive vocational training of practitioners, O&M technicians, and installers of EE building sector and was equipped with 59 items of energy audit and measurement equipment. The Shahid Sohi Centre was officially inaugurated by the EEEB National Project Director in November 2021.



The work on this output also resulted in development of a job standard for Building Operation and Maintenance (O&M) technician that has been registered in the TVTO system.

Total 9 Energy Service Companies (ESCOs) were engaged and capacitated through the project implementation for practicing various types of energy efficiency technological measures for pilot buildings. However, the ESCO projects have not been awarded with white certificates<sup>18</sup> as the certification process will have to be defined in the Iran Energy Exchange (IRENEX).

### **Output 3.2: Continuing public awareness-raising program on EEEB developed and implemented**

In 2019, the project prepared a strategic communication plan and organised the first public awareness campaign that comprised the following events:

- Training of 150 teachers from three levels of elementary, intermediate and high schools of Tehran (ToT approach) that later conducted EE and environment trainings and awareness events for more than 6,500 students in 112 schools by the trained teachers;
- 6 general training and awareness events for 500 employed women from various GoI organizations;
- One seminar for 16 environmental journalists on environment and climate change aspects complemented by a study tour of nZEB building; and
- 15 public awareness events in co-operation with Tehran Municipality (initially in 3 large cultural houses of Tehran and later in additional 12 houses)

Two more public awareness campaigns were initiated in 2020. The first one was implemented by the Energy Management Association of Iran (EMAOI) that delivered 24 on-line training courses on new methods of electricity, water consumption and solar energy management” for 203 trainees between November 2020 and March 2021.

The second campaign was implemented by the NGO “Cheragh Raga” NGO and reached out to almost 7,000 students and more than 1,000 teachers from 100 schools across Tehran. The aim of the campaign was to raise awareness on energy consumption management among families and energy efficiency in buildings. The campaign also included 8 webinars held due to the COVID-19 pandemic restrictions.

Two more awareness raising campaigns were planned for two of the largest pilots of the residential building complexes but had to be cancelled because of COVID-19 restrictions.

A project website and a page on Instagram were created for sharing information on progress in the project implementation and contributed to an increased project recognition. The number of website visitors increases from about 120,000 in 2019 to about 190,000 in 2020 (58% increase).

### **Output 3.3: Sustainable financial schemes for EEEB established and are functional**

As a result of the EEEB project activity, the high level EEEM Committee has been formed and regular meetings have been conducted. Market studies such as work instructions and supporting technical documents for implementation of the EEEM by-law provided by EEEB

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<sup>18</sup> A white certificate or the Energy Savings Certificate (ESC) is an instrument issued by an authorized body guaranteeing achievement of a specified amount of energy savings.



project were reviewed and discussed in EEEM Committee and after finalization were endorsed by the Supreme Energy Council in June 2021.

For full functionality of the EEEM, the required instructions have passed through the Supreme Energy Council. However, the financial scheme is still under negotiation as it took more time for structuring the scheme, budgeting, and resource allocation.

The project also proposed a financial scheme supporting the EE in buildings to the relevant local banks and other funding sources including the National Development Fund. However, there was no established financial scheme at the time of the TE as no national financial institution was ready to provide direct support for implementation of the proposed financial scheme.

**Overall assessment of Outcome 3:** This part of the project delivered a number of training and capacity building activities for various project stakeholders towards ensuring the compliance with the revised Building Code and energy labelling standards. Due to outbreak of COVID-19 and imposition of related meeting energy efficiency training workshop restrictions, nearly all training and awareness raising activities had to be transferred to the virtual (on-line) modality. Although in the beginning the project staff, trainers and trainees were not familiar with the new modalities, they in the end enabled covering higher number of trainees from all over the country in comparison to the original plans of physical training events.

One of the main obstacles to a systematic enforcement of compliance with the revised Article 19 and the building energy labelling standards are insufficient human capacities for construction and inspection of newly constructed buildings. Under Component 3, the EEEB project provided a train-the-trainers programme for a pool of master trainers and initial cascading down of the training to a group composed of several hundred civil engineers from the ICEO and municipalities. Given the size of the target group (the number of CEO members estimated at about 500,000 in all provinces), this is just a starting point and continued effort will be needed to train more civil engineers, builders, and municipality inspectors so that they can effectively implement the energy efficiency regulations throughout the country.

Establishment of the energy efficiency centre at the Shahid Soha centre of the Technical and Vocational Training Organization (TVTO) was a very important step as the latter organisation plays a complementary role to the universities in terms of building national experience with use of equipment for building energy efficiency. However, the centre was officially inaugurated only at the very end of the project period so the real impact on training of energy efficiency professionals remains to be seen.

### Effectiveness

Given the project's relevance discussed above, the EEEB project contributed to national development priorities, the UNDP CPD for Iran, UNDP Strategic Plan, UN SDGs, as well as to the GEF-4 and GEF-5 strategic priorities.

The extent to which the project contributed to the achieving or not achieving its intended outcomes and outputs is discussed in the previous section on 'Progress towards objective and expected outcomes'.



Other constraining factors to effectiveness, such as socio-economic, financial, institutional, and environmental risks are outlined in the Sustainability section below.

The overall effectiveness of the project is rated **Moderately Satisfactory (MS)**.

### Efficiency

The main issues examined in relation to efficiency were the length of the project implementation period and to what extent the results have been achieved with the least costly GEF and other resources possible.

The EEEB project was approved for implementation by GEF CEO for a period of 48 months. The signature of the Project Document by the Government of Iran on 16 August 2016 officially marked the start of the project implementation. However, due to protracted recruitment of the PMU staff, the implementation effectively started only in early 2017 and experienced several challenges related to turnover of project staff and lengthy procedures in hiring members of the project team.

The original closure day of the project was August 2020. Due to the initial delays in implementation, the project received 1 year extension. As a result of the negative impact of the COVID-19 pandemic in the project final 2 years, an automatic additional 6-month extension was granted. The revised project closure date was therefore February 2022.

As to the allocation and use of resources, the project has used about 77% of the GEF grant but has not delivered all planned results by the time of the TE. As discussed in the section on Finance and co-finance, the notable acceleration of the project implementation in the last 2 years could not fully compensate for the slow start of the project.

Based on the above findings, the efficiency in terms of the project timeline and use of resources is rated **Moderately Satisfactory (MS)**.



## Overall project outcome

**Table 16:** Status of achievement of the Project Objective

Result	Indicator	Baseline	EOP Target	Status at TE
<b>Goal</b>	Cumulative CO <sub>2</sub> emission reductions by 2029 from new buildings to be built during project lifetime (2016-2020), Mt CO <sub>2</sub>	0	153	Full set of data not available <sup>19</sup>
<b>Objective</b>	Average thermal energy consumption for space and water heating in pilot buildings reduced kWh/m2-yr	277	208	Reduced Energy Performance Index
	Average thermal energy consumption for space and water heating in new buildings in Iran by 2029 (residential & non-residential), kWh/m2-yr	277	160	N.A. <sup>20</sup>

The MTR report pointed out that the definition and formulation of the EOP indicators at the Project Objective level in the original Project Document was incorrect and their assigned targets were unrealistic. Although the MTR proposed a revision of the entire results framework, the MTR proposals for revision of the three indicators and their targets was not conducted and officially approved by the project partners.

There is no full set of data available for the target on cumulative reduction of CO<sub>2</sub>. Moreover, the target is unclear since it is based on the calculation of the “top-down indirect impacts” (see Annex H of the Project Document, page 90) and there is no method to calculate indirect impact. Therefore, achievement of the first target was not assessed.

The MTR proposed that instead of energy consumption only for space and water heating in existing buildings, total energy consumption (including electricity) should be considered. It was also proposed that instead of the absolute target a relative reduction in percentage of the baseline consumption should be set as the target. In this case, the original reduction of energy consumption (as per the Project Document) was 25% (reduction from 277 to 208 kWh/m2.year). According to the M&V protocols after 6-months full implementation of the energy efficiency measures in 141 pilot buildings out of 407 buildings, the achieved thermal energy savings reached about 14% including residential and non-residential buildings.

The third indicator is related to newly constructed buildings. Therefore, the achieved energy savings should be computed rather than measured based on the extent of projected energy savings in percent terms by comparing the baseline design and the design after the intervention. The initial results for energy simulation the pilot buildings and envelope building energy auditing of 6 new buildings indicated the average Energy Performance Index (EPI) of 185 kWh/m2.year in the buildings compliant with the revised Code 19. However, there is no data on calculation of the baseline EPI for comparison. Again, the proposal for revision of this indicator and target was not realised.

<sup>19</sup> In the last PIR there were 2 methods suggested for calculating the cumulative emission reductions based instead of using the Scenario 1B of the Project Document, considering a more practical scenario of incremental trend of compliancy over the years.

<sup>20</sup> This indicator applies to newly constructed buildings that are subject to a separate project by the Ministry of Road and Urban Development and the targets apply to that project. The MTR determined measurement of this indicator not feasible and therefore not applicable for the current project.



## Gender equality and women's empowerment

The focus of this section is to discuss to what extent was the project mainstreaming UNDP priorities such as poverty alleviation, improved governance, and women's empowerment, i.e. whether it is possible to identify and define positive or negative effects of the project on local populations, whether gender issues had been taken into account in project design and implementation and in what way has the project contributed to greater consideration of gender aspects.

The EEEB project was conceived before the issuance of the GEF Policy on Gender Mainstreaming<sup>21</sup> that expresses GEF's commitment to enhancing the degree to which the GEF and its implementing agencies promote the goal of gender equality through GEF-funded projects. Gender issues were not addressed during the substantive revision of the project in 2014-15. Consequently, there were no specific gender-related results defined at the project output and outcome levels in the PRF that would measure contribution to gender equality and women's empowerment. Also, the Project Document did not envisage development of a gender action plan.

Although there was no specific gender strategy planned, the project did make basic efforts to include gender perspectives. During project implementation, attention was given to inclusion of women in various capacity building and awareness raising activities. In terms of the collecting/using gender disaggregated data, the project team and energy services companies recorded the most relevant activities including women engagement on implementation of energy efficiency and renewable energy pilot projects, the number of created jobs, the amount of women participation in training and awareness raising programs and stakeholders' engagement. The surveys and reviews were undertaken by project team and 3rd party supervisors through site visits and monthly progress meetings.

Overall, this project tried to promote gender mainstreaming in EE business, develop new sustainable business opportunities and value chains for women, as well as support economic opportunities for women through different types of training.

In the PMU, 20% of the project team were women while in the GoI stakeholders about 33% of experts engaged were female. Remarkably, the representatives of IFCO, SATAB, the National Gas Company and Tavanir of the EEEM Committee are all female that demonstrates the effective role in decision-making on the EEEM mechanism and related legal frameworks.

More than 20% of members of the ESCOs engaged in the project were female, with about 10% of technical experts. It was estimated that the project created over 1,200 direct and indirect jobs for ESCOs.

Out of the total man-days of technical training, about 35% were for women participants. For general training and awareness raising events, the ratio of female participation was 44%.

The evaluators conclude that this project does not belong to the class of projects where gender equality would be one of the main concerns. Both males and females were involved to the

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<sup>21</sup> Policy on Gender Mainstreaming, Global Environmental Facility, May 2012



extent possible in the project activities, particularly in the capacity building and meetings of the project governance and planning bodies. Nevertheless, there is a room for improvement towards a stronger monitoring and reporting framework for the gender dimension for future projects.

### Cross-cutting issues

At the time of the EEEB project preparation, the cross-cutting issues were not central to the formulation of GEF/UNDP projects. Therefore, the cross-cutting issues were not incorporated into the design and implementation of the project.

The EEEB project design incorporated only indirectly some cross-cutting dimensions in terms of local environmental benefits from reduced local air pollution and related health benefits, as well as improvement of living standards, job creation, and economic diversification,

Nevertheless, and the impact on human rights, poverty and marginal communities could have received greater attention during the design and implementation of the project.

### GEF additionality

The traditional concept of additionality in the GEF projects as based on the incremental cost approach to ensure that GEF funds do not substitute for existing development finance but provide additional resources to produce global environmental benefits. This concept presents the additionality as a narrow focus on specific environmental benefits from the GEF funding but does not recognize other objectives that support the achievement of the global environmental benefits over a longer term.

The special environmental benefits from this project are examined under the assessment of the Project Objective and the environmental sustainability. In line with recent developments of evaluation methodology of GEF projects, the GEF additionality is examined in terms of changes in the attainment of direct project outcomes at project completion that can be attributed to GEF's interventions<sup>22</sup>.

The project provided a legal/regulatory additionality through its support for development of new and update of existing legal and regulatory frameworks. The reform of the legal and regulatory framework for energy efficiency was planned inception but the project accelerated revision of Code 19 for newly constructed buildings and development of standards for existing buildings. Although their official endorsement and promulgation was relatively fast, enforcement is beyond control of the project.

Institutional additionality was provided through capacity building of various EEEB project stakeholders and technical assistance to the relevant entities of the GoI and the participating ESCOs. Relevant academia institutions have also been strengthened to provide support for public awareness about energy efficiency in buildings.

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<sup>22</sup> An Evaluative Approach to Assessing GEF's Additionality, GEF/ME/C.55/inf. 01



As the full results of the pilot projects were not available at TE, information about eventual socio-economic additionality in terms of living standard improvements among population groups was not available.

### Catalytic/Replication effect

The plan for direct replication of the EEEB project results is based on promotion of improvements in the heating systems in existing buildings and design of the heating systems in new buildings. However, the replication and eventual upscaling will depend on the enforcement of the building code regulation as well as on success of the transformation and implementation of the energy efficiency market scheme.

A draft of policy for scaling up and replication of demonstration projects has been provided by EEEB project to be presented to policy makers and authorized government organizations as suggestions.

There is an indirect catalytic effect of the EEEB project in terms of enhanced capacities of ESCOs for installation of energy efficiency measures and monitoring & verification of energy savings. Materialisation of this effect will depend on availability of the financial scheme.

### Progress to impact

It is often too early to assess the long-term impacts of a project at the point of its completion as many results, particularly environmental benefits, can take several years to manifest. Nonetheless, reviewing progress to impacts at project completion helps determine the extent to which long-term results are likely.

The established and operational national BEID platform is the most direct and immediate impact of the EEEB project. Its first part, called the Energy Approach Evaluation System (EAES) enables monitoring of new buildings under construction from the start of design until the end of construction and allows investors, designers and supervisors to ensure that building design patterns and used methods of construction of buildings are in compliance with the requirements of Code 19 of the National Building Regulations. Based on the data entered in the system, the EAES provides results of the design and construction evaluation and issues related reports required for issuance of relevant certificates and obtaining necessary permits from legal entities. Furthermore, the system also provides checklists for use by the supervising engineers of construction projects to detect non-compliance with the Code 19 requirements.

The second part of the BEID platform (EMIS) enables calculation of the energy efficiency indices by monitoring the energy consumption of buildings based on the national standards 14253 and 14254 for labelling building energy performance. The system also presents information about potentials for energy savings and improving energy efficiency indicators, as well as the impact of implementation of energy saving measures in the buildings. Finally, the EMIS also identifies the energy baseline and potential to reduce greenhouse gas emissions for building owners.

The M&V system for measuring and independent verification of energy savings in the building sector developed with the project support enables collection and flow of information to the



domestic platform for Monitoring, Reporting and Verification (MRV) and has direct impact on provision reporting under the UNFCCC.

Implementation of the pilot projects had also direct impact on jobs in the participating ESCOs. The results from the pilot projects demonstrated the potential for achievement of energy savings through installation of various energy efficiency measures. However, progress towards long-term impacts in terms of replication and eventual upscaling of the pilot projects depends on the payback period for energy efficiency investments. As currently the energy prices in Iran are heavily subsidised, the payback periods for EE investments significantly exceed the horizon of 3-5 years and therefore such investments are not attractive for investors and building owners. The successful implementation of the EEM scheme could have a positive effect in terms of initiation of structural changes in the energy market of Iran under low energy prices.

The support of the EEEB project to collection of data on energy consumption in the building sector has contributed to ongoing efforts to convince public and private investors and bring their attention to EE opportunities through quantification and highlighting of the multiple and diverse benefits of EE investments. In the past, the necessary data was either not available or stored in different departments of governmental and municipal entities. Therefore, by consolidating the data and making them available in the on-line platform the project contributed to more exact documentation of the building stock and paved the way to performing analysis and substantial reporting, as well as integration of EE measures in national planning and budgeting schemes.

Overall, the likelihood of a long-term impact of the project will depend on removal of energy subsidies that are one of the main barriers preventing full realization of gains from energy efficiency measures in all sectors. Alternative to full removal of energy subsidies is compensation of the subsidised energy prices by means of an artificial “feed-in tariff” as it is foreseen in the EEM scheme. Although the GoI has instituted a series of policy and regulatory interventions on energy efficiency to accompany the reform, implementation of these measures has not reached its full potential. However, the overall goal of the energy price reform is to increase the country’s economic competitiveness and use its energy resources more efficiently while reduction of GHG emission is a marginal co-benefit of the reform. Since air pollution in Iran’s major cities is known to be among the highest in the world, other co-benefits such as improved air quality and public health may contribute to public acceptance of the energy price reform initially perceived as an unpopular measure.

By EEEB project efforts for replication of demonstration pilot projects in a larger scale, the PBO decided to support the EEM market, include EC certificate in the stock market, mainstream 25% and 30% electricity and natural gas consumption reduction in the country plan and also allocate 12 billion Rials to ESCOs for implementation of the EC pilots by the next year which may be continued based on their performance and governmental authorities’ satisfaction. The Municipality of Tehran recommended sharing EEEB project experience with other key municipalities by the Secretariat of Mayors of Country Megalopolis.



## Sustainability

Sustainability of the project is judged by the commitment of the beneficiary country to continue and replicate the project activities beyond the project completion date. The evaluation identifies key risks to sustainability and explains how these risks may affect continuation of the project benefits after the project closes. The assessment covers institutional/governance risks, financial, socio-political, and environmental risks.

Institutional framework and governance: The EEEB project catalysed the revision of relevant national policies and regulatory frameworks for improvement of energy efficiency in newly constructed and existing buildings. Moreover, it assisted in building national human and institutional capacities relevant for monitoring, verification, and enforcement of the revised regulatory frameworks through an array of training workshops and awareness raising events. By this token, the project was successful in targeting officials of GoI agencies, the Tehran Municipality, the ESCOs, academic institutions and NGOs.

The project convened the Project Steering Committee with multisectoral membership and on these grounds fostered collaboration of a variety of stakeholders of the building energy efficiency. The fact that a decision was taken to continue the functionality of the PSC after operational closure is a proof of strong ownership and institutional sustainability of the project results.

Financial sustainability: The financial sustainability is judged by the commitment of the project stakeholders for continued support for sustaining the already realized project benefits and their replication to new additional locations.

The Government of Iran and other project stakeholders demonstrated a strong commitment towards implementation of the EEEB project. However, as discussed above under ‘Progress to impact’, a sufficiently enabling environment for bulk investments into energy efficiency has not been created due to persisting subsidies of energy prices. Before the EEEB project inception and during its implementations, international sanctions imposed on Iran caused shortage of funding from multilateral and bilateral development assistance. Until the international sanctions are fully lifted, financial support for replication and upscaling of the project results will heavily depend on national budget.

Financial sustainability is further limited by high inflation rates in Iran. Over the last decade, the general price level increased much faster than electricity and gas prices. Therefore, investors expect the economic benefits of the EE measures to decrease and accordingly discount future cash flows. As a consequence, this further prolongs the payback periods for EE investments and reduce thus their economic viability.

Socio-political sustainability: Deployment of EE measures in the building sector has the potential to save domestic energy consumption and enable thus fuel exports. Moreover, EE investments contribute to job creation and further development of companies involved in installation and M&V of EE measures (e.g. ESCOs and start-up companies). Replication and upscaling of the EEEB project results would also contribute to development of domestic market with energy efficient construction materials and products and reduce the current dependency



on import of such items. Further positive effects originate in the support processes for EE installations, such as financial services, education, R&D, and consulting.

However, the socio-political sustainability to a great extent will depend on willingness of the GoI to reduce the energy price subsidies and the speed of this process. There are all signs that the GoI is aware of this necessity but resistance to fast removal of energy subsidies could seriously endanger the socio-political sustainability. The introduction of the EEM mechanism can be an interim solution as kind of “feed-in tariff” for energy saved will provide incentives for existing and newly emerging energy service providers (i.e. ESCOs) and investors.

Environmental sustainability: Global environmental benefits of EE investments are obvious as they contribute to reduction of GHG emissions from the conventional (fossil) energy sources and eventually replace the latter with renewable energy options (such as solar water heaters).

The global benefits are supplemented by several local environmental benefits. Nitrogen and sulphur oxides generated by electricity production from fossil fuels react in the atmosphere to form ground-level pollutants such as ozone, nitric acid, sulfuric acid and ammonium nitrates and sulphates that have negative effects on human health and cause visibility degradation, acid deposition, and eutrophication. In addition, the conventional power plants are also sources of direct emissions of mercury.

Electricity production from thermoelectric technologies is dependent on use of considerable amounts of water, primarily for cooling. The water use by conventional power plants is characterized by water withdrawals (the total amount of water taken from a source) and water consumption (the amount of water not returned to the source). EE measures therefore could be important with regard to water withdrawals, reduction of competition for scarce water resources, and reduces thermal pollution from water returns and prevents discharges of chemical pollutants, such as the biocides used in cooling towers of conventional power plants.

Towards the operational closure, the project team developed an exit strategy as an action plan for continued involvement of the key project stakeholders and definition of an approach towards sustaining the achievements of the EEEB project. It includes description of specific challenges and recommendations for each project component. The exit strategy represents a general outline that is planned to be further elaborated and to include more specific information, such as available post-project funding sources etc.

At the time of the TE, the document was available as a working draft that includes proposed steps to ensure sustainability of relevant activities and identifies important factors requiring attention in the future. However, no information was provided about further use of the exit strategy.

The summary of TE ratings of sustainability is in Table 17 below.



**Table 17: Sustainability ratings at TE**

<b>Sustainability aspect</b>	<b>TE rating</b>
Financial resources	Moderately Likely (ML)
Socio-political	Moderately Likely (ML)
Institutional framework and governance	Likely (L)
Environmental	Likely (ML)
<b>Overall Likelihood of Sustainability</b>	<b>Moderately Likely (ML)</b>

The summary of ratings for all the mandatory TE criteria is in Table 18 below.

**Table 18: Overall Project Rating**

<b>Monitoring &amp; Evaluation (M&amp;E)</b>	<b>Rating</b>
Monitoring and evaluation: design at entry	Satisfactory (S)
Monitoring and evaluation: implementation	Satisfactory (S)
Overall quality of monitoring and evaluation	Satisfactory (S)
<b>Implementing Agency (IA) Implementation &amp; Executing Agency (EA) Execution</b>	<b>Rating</b>
Quality of UNDP Implementation/Oversight	Satisfactory (S)
Quality of Implementing Partner Execution	Moderately Satisfactory (MS)
Overall quality of Implementation/Execution	Moderately Satisfactory (MS)
<b>Assessment of Outcomes</b>	<b>Rating</b>
Relevance	Relevant (R)
Effectiveness	Moderately Satisfactory (MS)
Efficiency	Moderately Satisfactory (MS)
Overall Project Outcome Rating	Moderately Satisfactory (MS)
<b>Sustainability</b>	<b>Rating</b>
Overall likelihood of sustainability	Moderately Likely (ML)
Financial resources	Moderately Likely (ML)
Socio-political	Moderately Likely (ML)
Institutional framework and governance	Likely (L)
Environmental	Likely (L)



## CONCLUSIONS AND RECOMMENDATIONS

This section contains conclusions as judgements based on the findings provided in the previous section. A short summary of relevant finding precedes each conclusion that is followed by a recommendation as a corrective action proposed to be taken by relevant project stakeholders to address the deficiencies identified in the findings and conclusions.

This Terminal Evaluation makes two types of recommendations. Recommendations on substantive matters are provided for consideration of the national project partners in order to ensure the project results are consolidated and sustained by relevant project stakeholders. These recommendations are suggested for implementation as soon as possible using the existing institutional capacities and frameworks that have been created by the current project. The second type of recommendations are related to improvement of design and implementation of future projects with the same or similar focus.

### Recommendations to follow-up and/or reinforce initial benefits from the project

Conclusion 1: The EEEB project was based on a multi-stakeholder approach and participation of variety of stakeholders including several agencies of the GoI, the Tehran Municipality, private sector, universities, and NGOs. Active engagement of the project stakeholders in meetings of the Project Steering Committee and several technical committees ensured strong ownership by the project results by the national stakeholders.

*Recommendation 1: The Government of Iran should consider institutionalisation of the EEEB Project Steering Committee and its continued functioning after the operational closure of the project.*

Conclusion 2: The project strengthened the legal and regulatory frameworks for revision of the Article 19 of the Building Code regarding newly constructed buildings and the building energy labelling standards for existing buildings. Enforcement of the revised regulatory article and standards is of critical importance for achievement of energy efficiency gains in buildings and for sustainability of relevant institutional and governance frameworks.

*Recommendation 2: The Government of Iran and the Tehran Municipality should ensure necessary human and financial resources are provided for enforcement of the revised Article 19 and standards.*

Conclusion 3: Due to limited international development assistance to Iran, future programmes for replication and eventual upscaling of the EEEB project results will depend on availability of domestic financing. However, such programmes will require provision of international expertise.

*Recommendation 3: UNDP CO should assist the GoI to identify multilateral and/or bilateral funding sources to finance provision of further international expertise on implementation of technologies for energy efficiency in buildings.*

Conclusion 4: The BEID/EMIS as a digital platform is a useful tool for monitoring of energy consumption and efficiency in the building sector. After successful launching, operation of the BEID/EMIS platform was still at a piloting stage at the time of the TE and covered only a few



hundreds of buildings under the auspices of the Tehran Municipality. Proper functioning of the EMIS platform will require on-line uploading data about gas and electricity consumption in buildings.

*Recommendation 4: The GoI should ensure on-line connection and uploading of data on electricity and gas consumption in buildings that are in possession of organisations belonging to the Ministry of Petroleum and the Ministry of Power.*

Conclusion 5: The pilot demonstration projects were important for showcasing various energy efficiency measures. However, due to initial delays in the project implementation and impact of the COVID-19 restrictions, monitoring of the EE gains was performed for less than 2 years. Continued application of the measurement and verification (M&V) protocols developed under the project is necessary for ensuring longer-term information and data for rigorous performance assessment of energy efficiency measures.

*Recommendation 5: UNDP CO in cooperation with the GoI should ensure continuation of the M&V activities in the pilot buildings after the project operational closure.*

Conclusion 6: One of the main obstacles to a systematic enforcement of compliance with the two regulatory measures are insufficient human capacities for construction and inspection of newly constructed buildings. Lack of trained professionals could prevent implementation of future programmes for implementation of the energy efficiency in buildings.

*Recommendation 6: The UNDP CO and GoI should ensure resources for continued training programmes of civil engineers, builders, and municipality inspectors so that they can effectively implement and enforce the energy efficiency regulations and standards throughout the country.*

Conclusion 7: The adopted Energy Efficiency & Environment Market mechanism is expected to initiate structural changes in the energy market of Iran under low energy prices and promote demand for energy efficiency. Implementation of the EEEM will facilitate expansion of businesses in the supply of energy services and provide opportunities for existing and newly emerging energy service providers (i.e. ESCOs). At the same time, the functional EEEM scheme is an interim solution in preparation for eventual removal of energy subsidies in the future.

*Recommendation 7: The GoI should accelerate implementation of the adopted Energy Efficiency & Environment Market (EEEM) mechanism with special emphasis on removal of barriers to participation in the EEEM scheme and facilitation of coordination between different players in the energy efficiency market.*

Conclusion 8: Private sector organisations such as Energy Service Companies (ESCOs) have a strong driving potential for deployment of energy efficiency measures in buildings. However, their real participation in EE projects was constrained by a number of factors, in particular lack of knowledge of building owners about long-term benefits of increasing energy efficiency through contracting independent ESCOs for EE projects.



*Recommendation 8: The GoI should consider developing a system of incentives for participation of ESCOs in EE projects, e.g. establishment of a Help Desk for provision of information and advice to building owners on contracting ESCOs, such as list of qualified ESCO companies for M&V of EE measures in buildings with contact details and technical advice on rules of energy performance contracting.*

Conclusion 9: The ESCO model used for implementation of the demonstration part of the project is very important not only for replication of programmes on energy efficiency in buildings but also for other energy consuming sectors and promotion of renewable energy in the country. However, there are several barriers to proper functioning and wider participation of ESCOs in EE projects.

*Recommendation 9: The GoI should address several barriers related to ESCOs, including certification and selection of ESCOs and mainstreaming of approval of legal documents for implementation of EE measures through ESCOs. It should also explore possibilities for establishment of a Super ESCO<sup>23</sup> for EE in public buildings.*

Conclusion 10: Public awareness on the benefits of energy efficiency in buildings is an important driver for energy efficiency market-oriented solutions and for progress in market transformation.

*Recommendation 10: The Government should continue public awareness campaign for energy efficient buildings using the channels of delivery established under the project. It should also consider establishment of a publicly accessible repository of all relevant documents and knowledge products resulting from the project.*

Conclusion 11: The project team developed an exit strategy as an action plan for continued involvement of the key project stakeholders and definition of an approach towards sustaining the achievements of the EEEB project. However, it appears to be only a draft internal document for the project. Consideration of the exit strategy by the Government would enhance sustainability of the EEEB project results. Effective liaison with the Government and its active involvement will be important for identification of post-project funding sources for replication and upscaling of the EE interventions demonstrated by the project.

*Recommendation 11: The project team should finalize the exit strategy and submit it to the Government for further consideration and planning of post-project activities.*

Conclusion 12: The design of the project had several inconsistencies in the indicators and targets in the project results framework. It is desirable to consider development of realistic project indicators and achievable targets.

*Recommendation 12: For preparation of future projects on EE in buildings, the UNDP project development teams should carefully consider development of consistent sets of indicators and their targets compliant with the SMART criteria.*

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<sup>23</sup> A Super ESCO is an entity established for coordination of large-scale implementation of energy efficiency projects, primarily in hospitals, schools, municipalities, government buildings and other public facilities, where the efficiency potential is substantial, but the implementation of energy savings programs is complicated by numerous factors.



### Lessons learned and good practices

The National Consultant visited seven pilot projects that included residential, governmental, educational, economical, low energy buildings and a disaster management site. The following lessons resulted from the visit of the pilots and interviews with their representatives.

The actual savings in the governmental building pilots can be higher, as the cooling and heating smart control system were bypassed because of staffs' claim, provide services for managers and guards in bedding time, low knowledge on EE, energy cost paid by the government and Covid-19 protocols. It is advisable to develop the capacity of governmental staff in advance of the demonstration projects and deploy different EE measurements for the permanent and temporary spaces in the pilot buildings.

The EE and RE measures deployed under the project provided modest energy savings up to 25 % due to the limited budget and time as well as to ESCOs obligations to implement those permitted EE/RE technologies as reflected in their contracts. As a result, demonstration of more effective and modern technologies capable of reductions in the energy consumptions more than above rate was not possible. Flexible contracting with ESCOs combined with documenting the findings from the pilot project could bring more cost-effective EE and RE solutions with participation of governmental organizations, ESCOs, beneficiaries, knowledge based companies and start-ups.

The high upfront cost of deployment of EE and RE technologies is definitely an issue worth of consideration, in particular for owners of residential buildings who cannot afford to pay such costs. Moreover, developers of huge buildings believed much more investment on low energy buildings is not profitable at the current Iran market due to lack of incentives, inadequate supplier knowledge and low trust of customers. This issue could be resolved only by enhancing the incentives through allocation of the subsidies to the EE/RE equipment and technologies instead of energy consumption. Creation of a building valuation system with inclusion of low energy buildings in higher value levels would inform building developers about the associated benefits and raise public awareness.

Powerhouse supervisors were extremely resistant to deployment of EE measures and easily discouraged the building managers due to the lack of knowledge/ skills/ trust and also concerns about investment reimbursements and their job security. Training events on energy efficiency for building managers and power-house supervisors is therefore important part of such initiatives and participation in such training should be considered for issuance of work permits for building managers and powerhouse supervisors.

The share-based business model motivated residential building owners to make financial contributions and thus facilitated the deployment of energy efficiency measures and technologies in the buildings. However, implementation of the model revealed risks of financial losses for ESCOs due to the devaluation of national currency, increased inflation rate, economic insecurity, and delayed or missing reimbursement of the building owners' portions to the ESCOs. If possible, modification of the share-based business model should be



considered, e.g. through purchase by the Government of the saved energy from ESCOs with the real energy prices through the energy efficiency and environment market (EEEM).

The pilot projects showed challenges for ESCOs to find skilful technicians and support staff. This appears to be a serious weakness and barrier to replication and upscaling of the pilot projects that has to be addressed by continuation of the EEEB project training programme by all relevant stakeholders (in particular INSO, IFCO, Municipality of Tehran, ICEO, BHRC, TVTO, Iran Association of ESCO, EE laboratories of Amir Kabir and Sharif Universities for diverse target groups.

Deployment of solar water heater systems and on-grid/off-grid solar photovoltaic systems in the eight Disaster Management Sites was not completed due to the limited time, unsuitable roof material for installation of solar PV panels, time-consuming procurement and importing processes, as well as complicated procedures for getting approval by the Iranian Electricity Distribution Company. Purchasing the same or similar equipment from the Iran market and deploying a hybrid system instead of separate off-grid and on-grid would shorten the time necessary for deployment of the EE/RE installations.

Discussions with the EEEB pilot experts and participating ESCOs identified the cost of EE technologies and lack of information, skills, awareness, and trust of building owners as the main challenges in the development of the pilots. The visited owners of the pilot buildings expressed their satisfaction with the energy savings and cost reductions. Smooth management, easier troubleshooting by the monitoring web-based software, possibility to simply oversee the powerhouses' staff performance, better maintenance and reduction of periodic services and costs were amongst the benefits cited by the visited building owners. Thus, reforming IR policies on EE subsidies and intensives and developing the capacity of all EE players and public seems to be essential.



## **Annex 1: Evaluation Terms of Reference**

To be inserted



## Annex 2: Evaluation Matrix

Evaluative Criteria Questions	Indicators	Sources	Methodology
Relevance: How does the project relate to the main objectives of the GEF focal area, and to the environment and development priorities at the local, regional and national levels?			
<ul style="list-style-type: none"> <li>Does the project relate to the GEF Climate Change focal area and has it been designed to deliver global environmental benefits in line with relevant international climate change objectives?</li> </ul>	<ul style="list-style-type: none"> <li>The project includes the relevant GEF outcomes, outputs and indicators</li> <li>The project makes explicit links with global climate action goals</li> </ul>	<ul style="list-style-type: none"> <li>Project Document</li> <li>GEF 4 Focal Area Strategy</li> </ul>	<ul style="list-style-type: none"> <li>Desk Review of Documents</li> </ul>
<ul style="list-style-type: none"> <li>Is the project aligned to national development objectives, broadly, and to national energy transition priorities specifically?</li> </ul>	<ul style="list-style-type: none"> <li>The project design includes explicit links (indicators, outputs, outcomes) to the national development policy/national energy policies</li> </ul>	<ul style="list-style-type: none"> <li>Project Document</li> <li>National development strategy, energy policies, etc.</li> </ul>	<ul style="list-style-type: none"> <li>Desk Review of Documents</li> <li>Interviews of the project stakeholders</li> </ul>
<ul style="list-style-type: none"> <li>Is the project's Theory of Change relevant to addressing the development challenge(s) identified?</li> </ul>	<ul style="list-style-type: none"> <li>The Theory of Change clearly indicates how project interventions and projected results will contribute to the reduction of the three major barriers to low carbon development (Policy, institutional/ technical capacity and financial)</li> </ul>	<ul style="list-style-type: none"> <li>Project Document</li> <li>PIF</li> </ul>	<ul style="list-style-type: none"> <li>Desk Review of Documents</li> </ul>
<ul style="list-style-type: none"> <li>Does the project directly and adequately address the needs of beneficiaries at local and regional levels?</li> </ul>	<ul style="list-style-type: none"> <li>The Theory of Change clearly identifies beneficiary groups and defines how their capabilities will be enhanced by the project</li> </ul>	<ul style="list-style-type: none"> <li>Project Document</li> <li>PIF</li> </ul>	<ul style="list-style-type: none"> <li>Desk Review of Documents</li> </ul>
<ul style="list-style-type: none"> <li>Is the project's results framework relevant to the development challenges have the planned results been achieved?</li> </ul>	<ul style="list-style-type: none"> <li>The project indicators are SMART</li> <li>Indicator baselines are clearly defined and populated and milestones and targets are</li> <li>The results framework is comprehensive and demonstrates systematic links to the theory of change</li> </ul>	<ul style="list-style-type: none"> <li>Project Document</li> <li>PIF</li> </ul>	<ul style="list-style-type: none"> <li>Desk Review of Documents</li> <li>Interviews of the project stakeholders</li> </ul>
<ul style="list-style-type: none"> <li>Have the relevant stakeholders been adequately identified and have their views, needs and rights been considered during design and implementation?</li> </ul>	<ul style="list-style-type: none"> <li>The stakeholder mapping and associated engagement plan includes all relevant stakeholders and appropriate modalities for engagement.</li> </ul>	<ul style="list-style-type: none"> <li>Project Document</li> <li>Inception report</li> </ul>	<ul style="list-style-type: none"> <li>Desk Review of Documents</li> <li>Stakeholder Interviews</li> </ul>



		<ul style="list-style-type: none"> <li>Planning and implementation have been participatory and inclusive</li> </ul>	<ul style="list-style-type: none"> <li>Stakeholder mapping/engagement plan and reporting</li> <li>Quarterly Reports</li> <li>Annual Reports (PIR)</li> </ul>	
	<ul style="list-style-type: none"> <li>Have the interventions of the project been adequately considered in the context of other development activities being undertaken in the same or related thematic area?</li> </ul>	<ul style="list-style-type: none"> <li>A partnership framework has been developed that incorporates parallel initiatives, key partners and identifies complementarities</li> </ul>	<ul style="list-style-type: none"> <li>Project Document</li> <li>Quarterly Reports</li> <li>Annual Reports (PIR)</li> <li>Stakeholder mapping/engagement plan and reporting</li> </ul>	<ul style="list-style-type: none"> <li>Desk Review of Documents</li> <li>Stakeholder Interviews</li> </ul>
	<ul style="list-style-type: none"> <li>Did the project design adequately identify, assess and design appropriate mitigation actions for the potential social and environmental risks posed by its interventions?</li> </ul>	<ul style="list-style-type: none"> <li>The SES checklist was completed appropriately and all reasonable risks were identified with appropriate impact and probability ratings and risk mitigation measures specified</li> </ul>	<ul style="list-style-type: none"> <li>Project Document</li> <li>SES Annex</li> </ul>	<ul style="list-style-type: none"> <li>Desk Review of Documents</li> </ul>
Effectiveness: To what extent have the expected outcomes and objectives of the project been achieved?				
	<ul style="list-style-type: none"> <li>Has the project achieved its output and outcome level targets?</li> </ul>	<ul style="list-style-type: none"> <li>The project has met or exceeded the output and outcome indicator end-of-project targets</li> </ul>	<ul style="list-style-type: none"> <li>Quarterly Reports</li> <li>Annual Reports (PIR)</li> <li>Site visit/field reports</li> </ul>	<ul style="list-style-type: none"> <li>Desk Review of Documents</li> <li>Interviews with project staff, stakeholders and beneficiaries</li> </ul>
	<ul style="list-style-type: none"> <li>Have lessons learned been captured and integrated into project planning and implementation?</li> </ul>	<ul style="list-style-type: none"> <li>Lessons learned have been captured periodically and/or at project end</li> </ul>	<ul style="list-style-type: none"> <li>Validation Workshop Minutes (<i>if available</i>)</li> <li>Quarterly Reports</li> <li>Annual Reports (PIR)</li> </ul>	<ul style="list-style-type: none"> <li>Desk Review of Documents</li> <li>Interviews with project staff, stakeholders and beneficiaries</li> </ul>
	<ul style="list-style-type: none"> <li>Has the M&amp;E plan been well-formulated, and has it served as an effective tool to support project implementation?</li> </ul>	<ul style="list-style-type: none"> <li>The M&amp;E plan has an adequate budget and was adequately funded</li> <li>The logical framework was used during implementation as a management and M&amp;E tool</li> </ul>	<ul style="list-style-type: none"> <li>Project Document</li> <li>M&amp;E Plan</li> <li>AWPs</li> <li>FACE forms</li> </ul>	<ul style="list-style-type: none"> <li>Desk Review of Documents</li> <li>Interviews with project staff and government stakeholders</li> </ul>



	<ul style="list-style-type: none"> <li>There was compliance with the financial and narrative reporting requirements (timeliness and quality)</li> <li>Monitoring and reporting has been at both the activity and results levels</li> </ul>	<ul style="list-style-type: none"> <li>Quarterly Narrative Reports</li> <li>Site visit reports</li> </ul>	
<ul style="list-style-type: none"> <li>Were relevant counterparts from the Government and civil society involved in project implementation, including as part of the Project Board?</li> </ul>	<ul style="list-style-type: none"> <li>The Project Board participation included representatives from key project stakeholders</li> </ul>	<ul style="list-style-type: none"> <li>Project Board Minutes (<i>if available</i>)</li> </ul>	<ul style="list-style-type: none"> <li>Interviews with project staff, stakeholders and beneficiaries</li> </ul>
<ul style="list-style-type: none"> <li>How effective were the partnership arrangements under the project and to what extent did they contribute to achievements of the project results?</li> </ul>	<ul style="list-style-type: none"> <li>A partnership framework has been developed that ensured coordination of parallel initiatives, involvement of key partners and identification of complementarities</li> </ul>	<ul style="list-style-type: none"> <li>Annual Reports (PIR)</li> <li>Quarterly reports</li> </ul>	<ul style="list-style-type: none"> <li>Desk Review of Documents</li> <li>Interviews with project staff, stakeholders and other donors</li> </ul>
<ul style="list-style-type: none"> <li>How well were risks (including those identified in the Social and Environmental Screening (SES) Checklist), assumptions and impact drivers being managed?</li> </ul>	<ul style="list-style-type: none"> <li>A clearly defined risk identification, categorization and mitigation strategy (updated risk log in ATLAS)</li> </ul>	<ul style="list-style-type: none"> <li>UNDP ATLAS Risk Log</li> <li>M&amp;E Reports</li> </ul>	<ul style="list-style-type: none"> <li>Desk Review of Documents</li> <li>Interviews with project staff, stakeholders and beneficiaries</li> </ul>
<ul style="list-style-type: none"> <li>Efficiency: Was the project implemented efficiently, in-line with international and national norms and standards?</li> </ul>			
<ul style="list-style-type: none"> <li>Did the project adjust dynamically to reflect changing national priorities/external evaluations during implementation to ensure it remained relevant?</li> </ul>	<ul style="list-style-type: none"> <li>The project demonstrated adaptive management and changes were integrated into project planning and implementation through adjustments to annual work plans, budgets and activities</li> <li>Changes to AWP/Budget were made based on mid-term or other external evaluation</li> <li>Any changes to the project's planned activities were approved by the Project Board</li> <li>Any substantive changes (outcome-level changes) approved by the Project Board and donor, as required</li> </ul>	<ul style="list-style-type: none"> <li>Annual Work Plans</li> <li>Validation Workshop Minutes</li> <li>Quarterly Reports</li> <li>Annual Reports (PIR)</li> <li>Project Board meeting minutes (<i>if available</i>)</li> </ul>	<ul style="list-style-type: none"> <li>Desk Review of Documents</li> <li>Interviews with project staff, stakeholders and beneficiaries</li> </ul>
<ul style="list-style-type: none"> <li>Was the process of achieving results efficient? Did the actual or expected results (outputs and outcomes) justify</li> </ul>	<ul style="list-style-type: none"> <li>The project achieved the planned results in an efficient manner</li> </ul>	<ul style="list-style-type: none"> <li>Annual Workplans</li> <li>Quarterly Reports</li> </ul>	<ul style="list-style-type: none"> <li>Desk Review of Documents</li> </ul>



	the costs incurred? Were the resources effectively utilized?	<ul style="list-style-type: none"> <li>Funds used for project implementation were utilized affectively and contributed to achievement of project results</li> </ul>	<ul style="list-style-type: none"> <li>Project document</li> </ul>	<ul style="list-style-type: none"> <li>Interviews with project staff, stakeholders, beneficiaries</li> </ul>
	<ul style="list-style-type: none"> <li>What were the strengths and weaknesses of the implementation modality?</li> </ul>	<ul style="list-style-type: none"> <li>The project implementation followed the division of responsibilities between the project implementing partners in an efficient manner</li> </ul>	<ul style="list-style-type: none"> <li>Annual Reports (PIR)</li> <li>Quarterly reports</li> </ul>	<ul style="list-style-type: none"> <li>Desk Review of Documents</li> <li>Interviews with project staff, stakeholders, beneficiaries</li> </ul>
	<ul style="list-style-type: none"> <li>Was co-financing adequately estimated during project design (sources, type, value, relevance), tracked during implementation and what were the reasons for any differences between expected and realised co-financing?</li> </ul>	<ul style="list-style-type: none"> <li>Co-financing was realized in keeping with original estimates</li> <li>Co-financing was tracked continuously throughout the project lifecycle and deviations identified and alternative sources identified</li> <li>Co-financiers were actively engaged throughout project implementation</li> </ul>	<ul style="list-style-type: none"> <li>Annual Work Plans (AWPs)</li> <li>Validation Workshop Minutes (<i>if available</i>)</li> <li>Quarterly Reports, including financial reports</li> <li>Annual Reports (PIR)</li> </ul>	<ul style="list-style-type: none"> <li>Desk Review of Documents</li> <li>Interviews with project staff, stakeholders, other donors and beneficiaries</li> </ul>
	<ul style="list-style-type: none"> <li>Was the level of implementation support provided by UNDP adequate and in keeping with the implementation modality and any related agreements?</li> </ul>	<ul style="list-style-type: none"> <li>Technical support to the Executing Agency and project team were timely and of acceptable quality.</li> <li>Management inputs and processes, including budgeting and procurement, were adequate</li> </ul>	<ul style="list-style-type: none"> <li>UNDP project support documents (emails, procurement/ recruitment documents)</li> <li>Quarterly Reports</li> <li>Annual Reports (PIR)</li> </ul>	<ul style="list-style-type: none"> <li>Desk Review of Documents</li> <li>Interviews with project staff, UNDP personnel</li> </ul>
	<ul style="list-style-type: none"> <li>Were financial audit/spot check findings adequately addressed and relevant changes made to improve financial management?</li> </ul>	<ul style="list-style-type: none"> <li>Appropriate management responses and associated actions were taken in response to audit/spot check findings.</li> <li>Successive audits demonstrated improvements in financial management practices</li> </ul>	<ul style="list-style-type: none"> <li>Project Audit Reports</li> </ul>	<ul style="list-style-type: none"> <li>Desk Review of Documents</li> </ul>
<ul style="list-style-type: none"> <li><b>Sustainability: To what extent are there financial, institutional, social-economic, and/or environmental risks to sustaining long-term project results?</b></li> </ul>				
	<ul style="list-style-type: none"> <li>Are there political, social or financial risks that may jeopardize the sustainability of project outcomes?</li> </ul>	<ul style="list-style-type: none"> <li>The exit strategy includes explicit interventions to ensure sustainability of relevant activities</li> </ul>	<ul style="list-style-type: none"> <li>Program Framework Document</li> <li>Risk Log</li> </ul>	<ul style="list-style-type: none"> <li>Desk Review of Documents</li> </ul>



<ul style="list-style-type: none"> <li>• What are the factors that will require attention in order to improve prospects of sustainability and potential for replication?</li> </ul>	<ul style="list-style-type: none"> <li>• The exit strategy includes explicit interventions to ensure sustainability of relevant activities and identifies relevant factors requiring attention in the future</li> </ul>	<ul style="list-style-type: none"> <li>• Program Framework Document</li> </ul>	<ul style="list-style-type: none"> <li>• Desk Review of Documents</li> </ul>
<ul style="list-style-type: none"> <li>• Do the legal frameworks, policies, and governance structures and processes within which the project operates pose risks that may jeopardize sustainability of project benefits?</li> </ul>	<ul style="list-style-type: none"> <li>• The exit strategy identifies relevant socio-political risks and includes explicit interventions to mitigate same</li> </ul>	<ul style="list-style-type: none"> <li>• Program Framework Document</li> <li>• Risk Log</li> </ul>	<ul style="list-style-type: none"> <li>• Desk Review of Documents</li> </ul>
<ul style="list-style-type: none"> <li>• Have key stakeholders identified their interest in project benefits beyond project-end and accepted responsibility for ensuring that project benefits continue to flow?</li> </ul>	<ul style="list-style-type: none"> <li>• Key stakeholders are assigned specific, agreed roles and responsibilities outlined in the exit strategy</li> </ul>	<ul style="list-style-type: none"> <li>• Program Framework Document</li> <li>• Risk Log</li> </ul>	<ul style="list-style-type: none"> <li>• Desk Review of Documents</li> </ul>
<ul style="list-style-type: none"> <li>• Are there ongoing activities that may pose an environmental threat to the sustainability of project outcomes?</li> </ul>	<ul style="list-style-type: none"> <li>• The exit strategy identifies relevant environmental risks and includes explicit interventions to mitigate same</li> </ul>	<ul style="list-style-type: none"> <li>• Program Framework Document</li> <li>• Risk Log</li> </ul>	<ul style="list-style-type: none"> <li>• Desk Review of Documents</li> </ul>
<b>Impact: Are there indications that the project has contributed to, or enabled progress toward, reduced environmental stress and/or improved ecological status?</b>			
<ul style="list-style-type: none"> <li>• Are there verifiable improvements in ecological status, or reductions in ecological stress, that can be linked directly to project interventions?</li> </ul>	<ul style="list-style-type: none"> <li>• The project has contributed directly to improved ecological conditions, including through reduced GHG emissions for energy generation</li> </ul>	<ul style="list-style-type: none"> <li>• Quarterly Reports</li> <li>• Annual Reports (PIR)</li> </ul>	<ul style="list-style-type: none"> <li>• Desk Review of Documents</li> </ul>



### Annex 3: List of People Interviewed

#	Stakeholder	Department / relevant subject	Date	Time	Name of representative
1	EEEB Project Team, part 1 (pilot sub-team)	Pilot projects, M&V procedures, monitoring and evaluation of the projects,	Tuesday, 18 Jan. 2022	15:00-16:00	Project pilot sub- team: Mr. Shakouri, Mr. Bagheri, Mr. Keyvanfar, Mr. Mohaghegh, Mr. Jafari
2	EEEB Project Team, part 2	NPM and Project team	Monday, 24 Jan. 2022	10:00 – 12:00	Project team: Ms. Shekari (NPM), Mr. Shakouri (DNPM), Mr. Mohaghegh (EMIS), Mr. Bagheri and Mr. Jafari (Pilot), Mr. Mirdamadi (Communication and Admin), Mr. Keyvanfar (Finance)
3	Road, Housing & Urban Development Research Center (BHRC)	Visit of EMIS platform Buildings & Structures Research Institute; Energy, Acoustics & Light Department	Monday, 24 Jan. 2022	13:30 – 14:00 14:00 – 15:00	Dr. Kari and Mr. Shaikhansari
4	Iran Construction Engineering Organization (ICEO)	Department of Architecture; Energy Committee	Tuesday, 25 Jan. 2022	11:30 – 12:30	Mr. Taheri
5	Iranian National Standardization Organization (INSO)	Monitoring the Implementation of Energy and Environmental Standards Department	Tuesday, 25 Jan. 2022	13:00 – 14:00	Ms. Ghezel bash and Ms. Mir Taghi
6	Tehran Municipality	Architectural department	Wednesday, 26 Jan. 2022	10:00 – 11:00	Ms. Miri
7	Universities	Amirkabir university of Technology	Wednesday, 26 Jan. 2022	11:30 – 12:30	Mr. Talebi
8	UNDP	UNDP Iran Office	Wednesday, 26 Jan. 2022	15:30 – 16:30	Mr. Mohammadi and Ms. Sadaat Razavi
9	Pilot visiting	Visit of selected office building Visit of selected residential building 1	Saturday, 29 Jan. 2022	10:00-14:00	<ul style="list-style-type: none"> <li>- Municipality District 3(Mr. Rahbar, Mr. kiani), with Asiawatt (Mr. Saadati), Mr. Jafari (pilot expert)</li> <li>- Residential building- Hormozan Complex (Mr. Afrashteh), with Pishraan energy ESCO (Mr. Mesgaran)</li> </ul>



#	Stakeholder	Department / relevant subject	Date	Time	Name of representative
10	Pilot visiting	Visit of low energy building pilot	Sunday, 30 Jan. 2022	08:00-10:00	Andishe city, Banafshe residential complexes, Ms. Yeganeh, Mr. menati, Mr. Shoaybi, Mr. Foroozfar, Mr. Mohaghegh (EMIS expert)
11	Visit of vocational training centre	Visit of Soha training centre (equipment and test pilots)	Sunday, 30 Jan. 2022	11:30 - 12:30	Mr. Farahani, Mr. Jaami and /Mr. Salmani, Mr. Samadi (Pishraan Energy ESCO), Mr. Mirdamaadi (communication expert)
12	NGOs	Cheragh Ragha	Monday, 31 Jan. 2022	11:30 – 12:30	Ms. Javaheripour
13	ESCOs	Association of energy service companies	Monday, 31 Jan. 2022	13:00 – 14:00	Mr. Kenari, Mr. Mirshams
14	Iran Energy Efficiency for electricity & Renewable Energies Organization (SATBA)		Monday, 31 Jan. 2022	14:30 – 15:30	Mr. Akbari
15	Ministry of Foreign Affairs (MFA)	Sustainable Development Department	Tuesday, 01 Feb. 2022	10:00 – 11:00	Mr. Golriz and Ms. Khalvandi
16	Planning and budgeting Organization (PBO)	Energy Department	Tuesday, 01 Feb. 2022	11:30 – 12:30	Mr. Hosseini
17	Iran Fuel Conservation Company (IFCO)	M&V Department	Tuesday, 01 Feb. 2022	13:00 – 14:00	Ms. Shahmohammadi
18	UNDP Regional Office	Regional Technical Specialist	Wednesday, 02 Feb. 2022	16:00 – 17:00	Ms. Miloo Beerepoot
19	Pilot visiting	Visit of educational and official building Visit of Commercial building	Saturday, 05 Feb. 2022	10:00 - 14:00	- Elm Sanaat University (Mr. Shaakeri, Mr. Zeinalzadeh, Mr. Talebzadeh), with Pishraan energy ESCO (Ms. Shekari, Mr. Mesgaran), Mr. Shakoori (DNPM) - Refah Chain Store (Mr. Rezapoor), with Pishraan energy ESCO (Mr. Mesgaran)
20	Pilot visiting	Visit of disaster management project Visit of selected residential building 2	Sunday, 06 Feb. 2022	10:00-14:00	- Disaster management project, Koohak site (Mr. Aalami), with JGH Denmark and Solar gostar Tehran (Mr. Mohajer) and Mr Jafar (Pilot Expert)



#	Stakeholder	Department / relevant subject	Date	Time	Name of representative
					- Ofogh Ekbaatan Complex (Mr. Khaaleghian and Mr. Teymoori), with ESCO Ariyan Behsa (Mr. Molaloo) and Mr Jafar (Pilot Expert)
21	EEEB Project Team, part 3	National Project Director	Monday, 07 Feb. 2022	10:00 – 11:00	Dr. Vatani
22	Department of Environment (DoE)	International affaires	Tuesday, 08 Feb. 2022	10:30 – 11:30	Ms. Ghorbanbeigi, Ms. Pourabedin, Representative of Deputy of Human environment



#### Annex 4: Summary information on the visited pilot projects

# of pilot	# of relevant batch	Type and owner of buildings	Area (m2)	Applied EE and RE technologies	Baseline annual NG consumption (m3/year)	Baseline annual electricity consumption (kWh/year)	Baseline annual CO2 emission (Ton)	Annual NG saving (m3)	Annual Electricity saving (kWh)	Annual total CO2 emission reduction (Ton)
1	I	P1-6 Office - Public	5,560	1- Burner adjustment and maintenance of the boiler house 2- Smart control system for cooling cycle 3- Smart control system for heating cycle 4- Electromagnetic anti-scale system 5- Replacement of burner	56,989	503,153	420	4,209	131,158	97
2	IV	P4-1 Residential - Private	5,800	1- Smart control system for heating cycle	1,307,152	-	1,092	106,884	-	89
3	IV	P4-170 to 209 Educational - Governmental	184,381	1- Smart control system for cooling cycle 2- Smart control system for heating cycle 3- Electromagnetic anti-scale system 4- Insulation of piping and equipment	3,171,000	12,672	18,103	486,815	462,757	1,069
4	IV	P4-162 Commercial - Public	3,100	1- Smart control system for cooling cycle 2- Smart control system for heating cycle	60,959	1,267,200	1,861	11,801	89,640	138
5	IV	P4-219 Residential - Private	24,000	1- Variable speed drive system for cooling tower fan 2- LED lights instead of FPL 3- Smart control system for lighting	-	2,534,000	1,774	-	189,053	132
6	TDMMO	TDMMO-B1	900	1- On-grid solar photovoltaic system 2- Off-grid solar photovoltaic system 3- Solar water heater system	-	-	-	5,420 *	49,800 **	41
7	MIG	MIG	25,000	1- Inverted roof 2- Low emissivity double glazing window 3- Envelope insulation 4- High efficiency energy consumer equipment	***					

\* based on simulation results and the project is still under implantation

\*\* based on simulation results and the project is still under implantation. The amount refers to the renewable generated electricity

\*\*\* Due to the fact that it is a newly constructed building, the impact of all implemented energy efficiency measures were still under review at the TE



## Annex 5: Stakeholder Engagement Plan (at project inception)

Stakeholder	Role
Ministry of Petroleum (MoP) and the MoP's Deputy for planning	Accountable for fossil fuel supply and use.
Iran Fuel Conservation Organization (IFCO)	An executive body of MoP, for the implementing Article 12 of the "Law on Elimination of barriers to competitiveness and promoting financial system" leads the Ministry's actions on improving energy efficiency and increasing renewable energy market share within the fossil fuel realm.
Iranian Natural Gas Company (INGC)	As natural gas as the main heating fuel in the building sector of the country, is another important sub-set of relevance to policy-making and execution.
Ministry of Energy (MoE) through Renewable energy and Energy Efficiency Organization (SATBA)	Established by the aim of preferment & improvement of energy proficiency.
Ministry of Roads and Urban Development, (MoRUD) through its Building and Housing Research Centre (BHRC) beside Deputy of Housing and Construction	Responsible for building standards through national building regulations.
Ministry of Cooperatives, Labour and social welfare (MCLS)	Through its deputy of entrepreneurship and employment
Iran Management and Planning Organization (MPO)	The Iranian governmental institution which draft and organize country's sixth five-year strategic development plan.
Iran National Standards Organization (INSO)	The Iranian governmental institution for standard development and certification works closely with the Ministries of Petroleum and Energy on development of energy efficiency standards and labels.
Ministry of Agriculture and Jihad (MoAJ) and Ministry of Industry, Mine and Trade (MoIMT)	Responsible for the identification of technologies required in the field of energy supply and consumption. They are mandated to facilitate the design and implementation of these technologies in the country.
Department of Environment (DOE)	Organization for Improvement national capacity to systematically address climate change issues.
Tehran municipality through its Sustainable Development and Environment Department	Responsible for issuing permits for those buildings which are compliant with energy efficiency regulation and standards. Also, plays a major role in increasing public awareness around the issue of energy efficiency.
Iran Energy Exchange (IRENEX)	A public joint-stock company registered in the base market of Iran Fara Bourse. The IRENEX statute stipulates that all energy carriers and energy-based derivatives shall be listed and traded on one of the IRENEX markets. The company's mission is to develop a market in which trades are done under transparency, efficiency and liquidity. Further, the has a.
Parliament's Energy Commission	Supervisory role over the IRENEX
Civil Society Organizations	There are a number of civil society organizations working on raising public awareness and providing general training courses on sustainable development, climate change, environment and energy efficiency. The most important of them is the Energy Institute of the universities working on education, research and development of energy efficiency and renewable energy technologies.
The Supply Group	A group which either builds, sells, trades on the energy efficient building market, insures, finances, and provides a broad range of energy solutions.
The Demand Group	A group that buys, rents or lives in the energy efficient buildings. The demand group is General Public with special target on the population of Tehran city.



## Annex 6: List of Documents Consulted

1. Policy Reforms and Market Transformation of the Energy Efficient Buildings Sector in the I.R. Iran, Project Identification Form, UNDP (2009)
2. Policy Reforms and Market Transformation of the Energy Efficient Buildings Sector in the I.R. Iran, Project Document, UNDP (2012)
3. Policy Reforms and Market Transformation of the Energy Efficient Buildings Sector in the I.R. Iran, Project Inception Report, UNDP (2017)
4. Policy Reforms and Market Transformation of the Energy Efficient Buildings Sector in the I.R. Iran, MTR Report, UNDP (2019)
5. Draft Country Programme Document for the Islamic Republic of Iran (2017-2021)
6. Tracking Tool for Climate Change Mitigation Projects (For CEO Endorsement)
7. Tracking Tool for Climate Change Mitigation Projects (For Mid-Term Evaluation)
8. Project Implementation Reports (PIR), UNDP (from 2018 to 2021)
9. Annual Project Progress Reports (APR from 2018 to 2021)
10. Annual Combined Delivery Report (CDR) by Activity (from 2016 to 2021)
11. Chief Technical Adviser (CTA) Mission Reports (2019)
12. Impact of COVID-19 Outbreak on the EEEB Project Implementation (2021)
13. Minutes of Meetings of Project Steering Committee (PSC)
14. Saving Reports Regarding the Implementation of Energy Saving Measures in Pilot Buildings in Tehran (2021-2022)
15. Technical Consulting and Supervisory Services of the Pilot Energy Efficiency Project Implemented in Selected Buildings in Tehran Province (2021)
16. Measurement and Verification of Energy Optimization and Renewable Energy Pilot Projects in Buildings in Tehran (2021)
17. Inspection Services for Renewable Energy Optimization Measures and Measuring and Verification of Energy Performance of Pilot Buildings Projects in Tehran province (2021)
18. Building 175 Low Energy Units in Andisheh- Tehran (2022)
19. Development of Information Technology (IT) Platform for Energy Approached Evaluation System (EAES) & Energy Monitoring Information System (EMIS) (2022)
20. EE laws, by-laws and standards including Code 19, EEEM, MRV Framework, EE Certificate Framework and Energy Building Labelling Standards 14253 and 14254
21. Co-Financing Reports IFCO, ESCOs, TDMMO, MIG, University of Tehran, Iran Association of ESCO and Tehran Electricity Distribution Company
22. GEF Evaluation Policy, GEF IEO (2019)
23. UNDP Revised Evaluation Policy, UNDP (2019)
24. Guidelines for GEF Agencies in Conducting Terminal Evaluation for Full-sized Projects, GEF (2017)
25. UNDP Evaluation Guidelines, Independent Evaluation Office of UNDP (2019)
26. Guidance for Conducting Terminal Evaluations of UNDP-Supported, GEF-Financed Projects, UNDP IEO (2020)
27. Outcome-Level Evaluations, A Companion Guide, UNDP (2011)
28. Glossary of Key Terms in Evaluation and Results Based Management, OECD (2010)
29. Ethical Guidelines for Evaluations (revised), UNEG (2008)



## Annex 7: Project Results Framework (at the Project Inception)

<p><b>This project will contribute to achieving the following Country Programme Outcome as defined in CPAP or CPD:</b> Outcome 4: National, subnational and local capacities enhanced to ensure 1) integrated management, conservation and sustainable use of ecosystems, natural resources and biodiversity; 2. mainstreaming environmental economics into national planning and audits; 3) effective use of knowledge and tools in prevention, control and response to current and emerging environmental pollution; 4) formulation and implementation of climate change mitigation and adaptation plans and projects</p> <p>Specifically, this project will contribute to the output of strengthening and promotion of national capacities to integrate energy efficiency in residential and economic sectors. (Output 4.3.2). The expected output is the reduction of GHG emissions due to increased energy efficiency in Iran's building sector.</p>	
<p><b>Country Programme Outcome Indicators:</b> 1) Lifetime direct GHG emissions avoided; 2) Lifetime direct post-project GHG emissions avoided; 3) Lifetime indirect GHG emissions avoided; 4) A supportive cross-sectoral energy efficiency strategy (CSSAP) and follow-up action to streamline provisions of the CSSAP in the sixth five year development plan complete with clear institutional roles, coordination within central and with local government, and addressing public awareness and professional education; 5) Revisited regulatory frameworks, in particular a thermal building code that addresses heating system efficiency and standards and labels for heating products; 6) Enforcement strategies and mechanisms for compliance with building code requirements and product standards and labels;</p>	
<p><b>Primary applicable Key Environment and Sustainable Development Key Result Area (same as that on the cover page, circle one):</b> 1. Mainstreaming environment and energy OR 2. Catalysing environmental finance OR 3. Promote climate change adaptation OR 4. Expanding access to environmental and energy services for the poor.</p>	
<p><b>Applicable GEF Strategic Objective and Program:</b> CCM-2, Energy Efficiency</p>	
<p><b>Applicable GEF Expected Outcomes:</b> Outcome 2.1: Appropriate policy, legal and regulatory frameworks adopted and enforced Outcome 2.2: Sustainable financing and delivery mechanisms established and operational</p>	
<p><b>Applicable GEF Outcome Indicators:</b> <i>Indicator 2.1: Extent to which EE policies and regulations are adopted and enforced (score of 1 to 5)</i> <i>Indicator 2.2: Volume of investment mobilized</i></p>	

Project Components	Indicator	Baseline	Target	Means of Verification	Assumptions
<b>Project Goal:</b> Reduction of GHG emissions due to improved energy EE in the building sector in Iran	Cumulative CO2 emission reductions by 2029 from new buildings to be built during project lifetime (2016-2020) against baseline	None	153 Mton CO2	Calculations based on the quantitative measurements of energy use in space and water heating and fuel mix, based on standard best practice.	Government will continue construction at planned rates
<b>Project Objective:</b> GHG mitigation from the buildings sector in Iran through legislative, policy and regulatory reforms and implementation of cost-effective mitigation measures as well as increasing the share of solar water heaters to meet the energy requirements of new buildings and existing stock.	Average thermal energy consumption for space and water heating in pilot buildings by end of project (residential & non-residential)	Around 277 kWh/year.m2 on average	Around 166 kWh/year.m2 on average	Quantitative assessment of thermal performance of buildings through selected audits by independent project evaluation teams.	Government will continue construction at planned rates
	Average thermal energy consumption for space and water heating in new and existing buildings in Iran by 2029 (residential & non-residential)		Around 208 kWh/year.m2 on average	Calculations based on the quantitative measurements of energy use in space and water heating and fuel mix, based on standard best practice.	
<b>Component 1:</b> Review and Revision of legislative, policy and regulatory frameworks that impact building efficiency in Iran	Energy performance requirements for new buildings including heating system energy performance requirements, in place and enforced Average energy demand for new construction improved	No requirements for heating system energy performance Average energy demand around 277 kWh/year.m2	Heating system energy requirements adopted by end of project Average energy demand around 110 kWh/year.m2 for new construction by end of project	Project documentation Quantitative assessment of thermal performance of buildings through selected audits by independent project evaluation teams. Calculations based on the quantitative measurements of energy use in space and water heating and fuel mix, based on standard best practice.	Government shows willingness to enforce codes



Project Components	Indicator	Baseline	Target	Means of Verification	Assumptions
<b>Output 1.1:</b> A review of baseline energy policy, building regulation, heating product standard and label frameworks that impact building energy efficiency in Iran and gap analysis	Comprehensive review of current energy policy, building regulations and heating product standard and label frameworks	Not available	Completed by end of 2nd year of project	Project documentation  Independent evaluation	
<b>Output 1.2:</b> Revisited regulatory frameworks, in particular a thermal building code that addresses heating system efficiency and standards and labels for heating products	Building energy codes for thermal performances for buildings updated with heating system energy performance requirements. Test standards and energy performance requirements developed and implemented for cooking, heating and water heating products	Heating system performance requirements not included in building energy code No test standards	Heating system performance requirements included in building energy code by end of 3rd year of project  Three test standards and requirements developed and implemented by end of project	Project documentation  National regulations Independent evaluation	
<b>Output 1.3:</b> Enforcement strategies and mechanisms for compliance with building code requirements and product standards and labels	National compliance measurement and regulation mechanisms in place and implemented through municipalities. Building engineers trained in compliance with building energy code Test laboratories properly equipped and trained to perform testing and certification of EE building products	No compliance mechanism in place  No training of building engineers  No test laboratories	Compliance checking underway in at least 5 Tehran municipalities by end of project 1,000 building engineers trained by end of project Two laboratories properly equipped and trained by end of project	Project documentation Enforcement program documentation Compliance reports Independent evaluation Spot checks	Government shows willingness to enforce codes Robust demand for testing/certification Services created by a revised code enforcement
<b>Output 1.4:</b> A supportive cross-sectoral energy efficiency strategy and action plan (CSSAP) and follow-up action to streamline provisions of the CSSAP in the sixth five-year development plan complete with clear institutional roles, coordination within central and with local government, an addressing public awareness and professional education.	CSSAP developed and agreed by government departments  New policies introduced to address cross-sectoral EE issues	No CSSAP  No policies for cross-sectoral EE issues	CSSAP agreed by 2 government departments and 1 EE agency by end of 2 <sup>nd</sup> year of project Two new cross-sectoral EE policies adopted by end of project	Project documentation  CCSAP  Government policy plans	Government shows willingness to implement CSSAP's recommendations Capacity for monitoring and verification has been established
<b>Component 2:</b> Pilot installations of EE and RE measures in existing building stock	EE and SWH pilots implemented CO2 emissions from pilot buildings reduced	Large-scale pilots only in government owned buildings. Some CO2 emission reductions (not attributed to the project)	Large scale pilot in government owned and private buildings (for the latter 330 heating system retrofits, 100 window retrofits and 85 SWH installations realized by end of project) 1 Mton CO2 emission reductions cumulatively from pilots in private buildings achieved by end of project	Quantitative assessment of thermal performance of pilot buildings through selected audits by independent project evaluation teams.  Calculation of cumulative impacts based on international best practice	
<b>Output 2.1:</b> Implementation of cost-effective energy saving options in privately owned buildings to retrofit	Heating system retrofits installed  Double paned windows installed	Installation of	Retrofitting of boiler rooms in 39 government buildings	Project documentation  Independent evaluation	Suitable pilot buildings can be identified



Project Components	Indicator	Baseline	Target	Means of Verification	Assumptions
the heating system (330) and insulate select thermal bridges (double paned windows – 100)		22,000m2 of double pane windows in 100 government buildings. Retrofitting of boiler rooms in 39 government buildings	Heating system retrofits installed in 330 privately owned buildings by end of 3rd year of project Installation of 22,000m2 of double pane windows in 100 government buildings. Double paned windows installed in 100 privately owned buildings by end of 2 <sup>nd</sup> year of project	Site visits	
<b>Output 2.2:</b> Installation of 85 solar water heaters and their integration with the retrofitted heating system	Solar water heaters installed and integrated with heating system	Installation and commissioning of an integrated SWH system in 50 government buildings	Installation and commissioning of an integrated SWH system in 50 public buildings 85 heating system integrated SWHs installed in privately owned buildings by end of 3rd year of project	Project documentation  SWH sales & installation data  Independent evaluation  Site visits	Suitable pilot buildings can be identified Reliable sales & installation data is available
<b>Output 2.3:</b> Evaluation of demonstrations and dissemination of results to heating system professionals	Pilots evaluated  Pilot results communicated to heating system experts	No evaluation  No communication	All pilots evaluated by end of 3rd year of project Results communicated by end of project	Project documentation Demo program plan Independent evaluation	Willing stakeholder participation
<b>Output 2.4:</b> Guidelines and training materials for retrofitting heating systems complete with drawings of new designs and boiler room specifications	Guidelines and training materials developed and used in training	No materials available	Materials developed by end of 2nd year of project Materials used in training (as defined in component 3) by end of project	Project documentation  Training materials  Independent evaluation	Willing stakeholder participation
<b>Component 3:</b> Implementation of market transformation strategies	Training and capacity building of heating system supply chain delivered Supply chain trained in heating system EE improvements Public awareness of EE issues, and climate change raised	Isolated training of supply chain parties Low public awareness of EE issues and climate change (exact percentage unknown)	Training and capacity building integrated I degree courses for craftsmen by end of project At least 7,000 professionals trained by end of project Public awareness tripled by end of project		
<b>Output 3.1:</b> Capacity development for manufacturers of heating system including specifications for improved boilers, burners, heat distribution systems and pumps	Heating system products manufacturers trained in design of energy efficient heating system components Plan for continuous training in place and hosted at relevant government agencies	No comprehensive training  No plan	All major, and at least 50% of small and medium-size, heating system and product manufacturers trained by end of project Plan agreed by end of project	Project documentation  Training materials	Sufficient domestic demand to meet supply
<b>Output 3.2:</b> Capacity development of building professionals in implementation of heating system requirements in a revised thermal	Building and heating system professionals trained	No substantial training	1,000 building professionals trained by end of 3rd year of project	Project documentation  Training materials	Sufficient domestic demand to meet supply



Project Components	Indicator	Baseline	Target	Means of Verification	Assumptions
building code and product standards, including 1,000 developers, heating system engineers, architects, builders etc.					
<b>Output 3.3:</b> Training of a cadre of accredited boiler room engineers, equipped with necessary monitoring equipment to implement EE measures	Boiler room engineers trained  Boiler room engineers equipped with monitoring equipment.	Training of 5,000 skilled workers in implementation of building EE measures No training focused on boiler room engineers. No monitoring equipment provided	Training of 5,000 skilled workers in implementation of building EE measures 1,000 boiler room engineers trained by end of project 250 boiler room engineers provided with monitoring equipment	Project documentation  Training materials  Post training surveys	Sufficient numbers of suitable candidates
<b>Output 3.4:</b> Mandatory (e-learning) courses for different stakeholders in the building value chain on the revised thermal code, delivered by professional associations, technical schools and Ministry of Labour courses and the setting-up of an examination and accreditation body	Training courses developed together with professional associations, technical schools and Ministry of Labour Training delivered to building value chain stakeholders	No mandatory courses exist	Training built into degree courses for building craftsmen by end of project 10 training courses delivered to at least 500 building sector workers across various parts of the building supply chain by end of project	Project documentation  Training materials  Post training surveys	Willingness of stakeholders to work together
<b>Output 3.5:</b> A stakeholder awareness-raising campaign including a public awareness campaign linking heating system retrofitting to lowering energy bills	Review of international best practice in the introduction of SWHs. Multi-channel awareness campaign developed and implemented, targeting different messages at different audiences. Public awareness of EE issues, climate change and SWH benefits	No review available Isolated awareness raising activities in place Public awareness low (exact percentage unknown)	Review completed Nationwide awareness campaigns implemented for at least two years and local campaigns implemented for at least one year by end of project Public awareness tripled by end of project	Awareness campaign materials  Project inception and post-campaign attitudes survey	Ability to resource the campaign and its evaluation
<b>Output 3.6:</b> Proposals for financial incentives for households and sustainable financing mechanisms and capacity development for select banks and financial institutions in assessing EE loans	Financial incentive packages for the purchase/installation of heating system improvements by households developed in collaboration with suitable financial institutions and presented to the relevant government departments for funding, with full financial and operational details Capacity building strategy for banks and suitable financial institutions developed and agreed.	No household financial incentive scheme exists  No capacity building strategy in place	Three different financial incentive schemes developed and presented for funding by end of 2nd year of project  Capacity development strategy agreed and in place by end of project	Project progress reports  Financial incentives assessment reports	Ability of banks, financial institutions and relevant government departments to design an incentivized financial package



## Annex 8: Performance Rating of GEF Projects

The main dimensions of project performance on which ratings are provided in terminal evaluation are outcomes, sustainability, quality of monitoring and evaluation, quality of implementation, and quality of execution.

### Outcome ratings

The overall ratings on the outcomes of the project will be based on performance of the criteria of relevance, effectiveness and efficiency. A six-point rating scale is used to assess overall outcomes.

Highly Satisfactory (HS)	Level of outcomes achieved clearly exceeds expectations and/or there were no short comings
Satisfactory (S)	Level of outcomes achieved was as expected and/or there were no or minor short comings
Moderately Satisfactory (MS)	Level of outcomes achieved more or less as expected and/or there were moderate short comings
Moderately Unsatisfactory (MU)	Level of outcomes achieved somewhat lower than expected and/or there were significant shortcomings
Unsatisfactory (U)	Level of outcomes achieved substantially lower than expected and/or there were major short comings
Highly Unsatisfactory (U)	Only a negligible level of outcomes achieved and/or there were severe short comings
Unable to Assess (UA)	The available information does not allow an assessment of the level of outcome achievements

### Sustainability Ratings

The sustainability will be assessed taking into account the risks related to financial, sociopolitical, institutional, and environmental sustainability of project outcomes. The evaluator may also take other risks into account that may affect sustainability. The overall sustainability will be assessed using a four-point scale.

Likely (L)	There is little or no risks to sustainability
Moderately Likely (ML)	There are moderate risks to sustainability
Moderately Unlikely (MU)	There are significant risks to sustainability
Unlikely (U)	There are severe risks to sustainability
Unable to Assess (UA)	Unable to assess the expected incidence and magnitude of risks to sustainability

### Monitoring and Evaluation Ratings

Quality of project M&E are assessed in terms of design and implementation on a six point scale:

Highly Satisfactory (HS)	There were no short comings and quality of M&E design / implementation exceeded expectations
Satisfactory (S)	There were no or minor short comings and quality of M&E design / implementation meets expectations
Moderately Satisfactory (MS)	There were some short comings and quality of M&E design/implementation more or less meets expectations
Moderately Unsatisfactory (MU)	There were significant shortcomings and quality of M&E design / implementation somewhat lower than expected
Unsatisfactory (U)	There were major short comings and quality of M&E design/implementation substantially lower than expected
Highly Unsatisfactory (U)	There were severe short comings in M&E design/ implementation
Unable to Assess (UA)	The available information does not allow an assessment of the quality of M&E design / implementation



### **Implementation and Execution Rating**

Quality of implementation and of execution will be rated separately. Quality of implementation pertains to the role and responsibilities discharged by the GEF Agencies that have direct access to GEF resources. Quality of Execution pertains to the roles and responsibilities discharged by the country or regional counterparts that received GEF funds from the GEF Agencies and executed the funded activities on ground. The performance will be rated on a six-point scale.

Highly Satisfactory (HS)	There were no short comings and quality of implementation / execution exceeded expectations
Satisfactory (S)	There were no or minor short comings and quality of implementation / execution meets expectations
Moderately Satisfactory (MS)	There were some short comings and quality of implementation / execution more or less meets expectations
Moderately Unsatisfactory (MU)	There were significant shortcomings and quality of implementation / execution somewhat lower than expected
Unsatisfactory (U)	There were major short comings and quality of implementation / execution substantially lower than expected
Highly Unsatisfactory (U)	There were severe short comings in quality of implementation / execution
Unable to Assess (UA)	The available information does not allow an assessment of the quality of implementation / execution



## Annex 9: Evaluation Report Outline<sup>24</sup>

- i. Opening page:
    - Title of UNDP supported GEF financed project
    - UNDP and GEF project ID#s.
    - Evaluation time frame and date of evaluation report
    - Region and countries included in the project
    - GEF Operational Program/Strategic Program
    - Implementing Partner and other project partners
    - Evaluation team members
    - Acknowledgements
  - ii. Executive Summary
    - Project Summary Table
    - Project Description (brief)
    - Evaluation Rating Table
    - Summary of conclusions, recommendations and lessons
  - iii. Acronyms and Abbreviations
1. Introduction
    - Evaluation purpose
    - Scope & Methodology
    - Data collection and analysis
    - Evaluation ethics
    - Limitations
  2. Project description and development context
    - Project start and duration
    - Development context
    - Problems that the project sought to address
    - Immediate and development objectives of the project
    - Description of the project's Theory of Change
    - Expected results
    - Total resources
    - Main stakeholders and key partners involved
  3. Findings  
(In addition to a descriptive assessment, all criteria marked with (\*) must be rated)
- 3.1 Project Design / Formulation
    - Analysis of LFA/Results Framework (Project logic /strategy; Indicators)
    - Assumptions and Risks
    - Lessons from other relevant projects (e.g., same focal area) incorporated into project design

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<sup>24</sup> The presented TE Report outline is based on the 2020 UNDP/GEF TE guidelines that reflect the GEF-7 project development template. However, the project was prepared according to the GEF-6 project development template that was not identical with the GEF-7 template.



- Planned stakeholder participation
  - Replication approach
  - UNDP comparative advantage
  - Linkages between project and other interventions within the sector
  - Gender responsiveness of the project design
  - Social and environmental safeguards
- 3.2 Project Implementation
- Adaptive management
  - Actual stakeholder participation and partnership arrangements
  - Project Finance and co-finance
  - Monitoring & Evaluation: design at entry (\*), implementation (\*), overall assessment of M&E (\*)
  - UNDP implementation/oversight (\*), Implementing Partner execution (\*) and overall assessment of implementation/oversight and execution (\*)
  - Risk Management
- 3.3 Project Results and Impacts
- Progress towards objective and expected outcomes
  - Relevance (\*)
  - Effectiveness
  - Efficiency (\*)
  - Overall Project Outcome (\*)
  - Sustainability: financial(\*), socio-political(\*), institutional framework and governance(\*), environmental(\*), overall likelihood of sustainability(\*)
  - Country ownership
  - Gender equality and women's empowerment
  - Cross-cutting issues
  - GEF additionality
  - Catalytic/Replication effect
  - Progress to impact
4. Main Findings, Conclusions, Recommendations, Lessons Learned
- Main Findings
  - Conclusions
  - Recommendations
  - Lessons learned
5. Annexes
- Terms of Reference
  - Evaluation Question Matrix
  - List of persons interviewed
  - List of documents reviewed
  - Project results framework
  - Performance ratings of GEF projects
  - Evaluation Consultant Agreement Form
  - Annexed in a separate file: TE audit trail



## Annex 9: Evaluation Consultant Agreement Forms

### Agreement to abide by the Code of Conduct for Evaluation in the UN System

#### Evaluators:

1. Must present information that is complete and fair in its assessment of strengths and weaknesses so that decisions or actions taken are well founded.
2. Must disclose the full set of evaluation findings along with information on their limitations and have this accessible to all affected by the evaluation with expressed legal rights to receive results.
3. Should protect the anonymity and confidentiality of individual informants. They should provide maximum notice, minimize demands on time, and respect people's right not to engage. Evaluators must respect people's right to provide information in confidence and must ensure that sensitive information cannot be traced to its source. Evaluators are not expected to evaluate individuals and must balance an evaluation of management functions with this general principle.
4. Sometimes uncover evidence of wrongdoing while conducting evaluations. Such cases must be reported discreetly to the appropriate investigative body. Evaluators should consult with other relevant oversight entities when there is any doubt about if and how issues should be reported.
5. Should be sensitive to beliefs, manners and customs and act with integrity and honesty in their relations with all stakeholders. In line with the UN Universal Declaration of Human Rights, evaluators must be sensitive to and address issues of discrimination and gender equality. They should avoid offending the dignity and self-respect of those persons with whom they come in contact in the course of the evaluation. Knowing that evaluation might negatively affect the interests of some stakeholders, evaluators should conduct the evaluation and communicate its purpose and results in a way that clearly respects the stakeholders' dignity and self-worth.
6. Are responsible for their performance and their product(s). They are responsible for the clear, accurate and fair written and/or oral presentation of study imitations, findings and recommendations.
7. Should reflect sound accounting procedures and be prudent in using the resources of the evaluation.

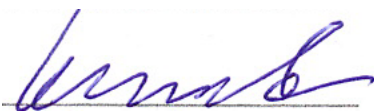
Name of Consultant: Dalibor Kysela

Name of Consultancy Organization (where relevant): N.A.

I confirm that I have received and understood and will abide by the United Nations Code of Conduct for Evaluation.

Signed at Vienna on 28 December 2021

Signature: \_\_\_\_\_





## Agreement to abide by the Code of Conduct for Evaluation in the UN System

### Evaluators:

1. Must present information that is complete and fair in its assessment of strengths and weaknesses so that decisions or actions taken are well founded.
2. Must disclose the full set of evaluation findings along with information on their limitations and have this accessible to all affected by the evaluation with expressed legal rights to receive results.
3. Should protect the anonymity and confidentiality of individual informants. They should provide maximum notice, minimize demands on time, and respect people's right not to engage. Evaluators must respect people's right to provide information in confidence and must ensure that sensitive information cannot be traced to its source. Evaluators are not expected to evaluate individuals and must balance an evaluation of management functions with this general principle.
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6. Are responsible for their performance and their product(s). They are responsible for the clear, accurate and fair written and/or oral presentation of study imitations, findings and recommendations.
7. Should reflect sound accounting procedures and be prudent in using the resources of the evaluation.

Name of Consultant: Ali Arvahi

**Name of Consultancy Organization** (where relevant): N.A.

I confirm that I have received and understood and will abide by the United Nations Code of Conduct for Evaluation.

Signed at Tehran on 28 December 2021

Signature:





**Annex 10: Audit Trail – annexed as separate file**

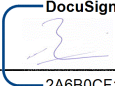


## TE Report Clearance Form

**Terminal Evaluation Report for *Policy Reforms and Market Transformation of the Energy Efficient Buildings Sector of the I.R. Iran, PIMS 4018* Reviewed and Cleared By:**

**Commissioning Unit (M&E Focal Point)**

Name: Mohammadreza Khosravi

Signature:  DocuSigned by:  
2A6B0CF1951E44A... Date: 27-Apr-2022

**Regional Technical Advisor (Nature, Climate and Energy)**

Name: Milou Beerepot



Signature: \_\_\_\_\_ Date: 19 April 2022