Country: Islamic Republic of Iran
PROJECT DOCUMENT

Project Title: Policy Reforms and Market Transformation of the Energy Efficient Buildings Sector of the I.R. Iran (PIMS 4018)
UNDAF Outcome(s): Environmentally Sustainable Development – National capacities to integrate energy efficiency in residential and economic sectors promoted.
UNDP Strategic Plan Environment and Sustainable Development Primary Outcome: Environment and Sustainable Development
UNDP Strategic Plan Secondary Outcome: Strengthened national capacities to mainstream environment and energy concerns into national development plans and implementation systems

Expected CP Outcome(s):
(Those linked to the project and extracted from the country programme document)
The CP (2012-16) will focus on four main areas: (a) poverty reduction; (b) health in terms of support to GFATM[1] implementation; (c) environmentally sustainable development; and (d) natural disaster management.

On the topic of the environment, the country programme will focus on contributing to national capacities for integrated management, conservation, and sustainable use of ecosystems and biodiversity; and for a representative network of "protected areas" to be further strengthened. Climate change mitigation and adaptation capacities will also be targeted at the national and subnational levels, to contribute to the adoption of a climate resilient development path that is aligned with an "inclusive growth" development model. National capacities will be further supported to strengthen mechanisms for assessing and monitoring environmental impacts and trends, including those that signify the relationship between environmental degradation and poverty. UNDP will cooperate with Iran to access global funding mechanisms under the Multilateral Environment Agreements. By 2015, it is envisaged that Iran will have reduced the consumption of hydrochlorofluorocarbons by 10% in accordance with the Montreal Protocol targets.

This project will contribute towards the climate change mitigation goals at the national and subnational levels. Specifically, it will contribute to Outcome 4 of the CP: 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; and,
4) Formulation and implementation of climate change mitigation and adaptation plans and projects.

Expected CPAP Output (s)
(Those that will result from the project and extracted from the CPAP)
This project relates to the CPAP expected output to strengthen and promote national capacities to integrate energy efficiency in residential and economic sectors. Specifically output 4.3.2 of the CPAP seeks a reduction of GHG emissions due to increased energy efficiency in Iran's building sector.
The main indicators of this project will be:

[1] Global Fight against AIDS, Tuberculosis and Malaria

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; and,
6) Enforcement strategies and mechanisms for compliance with building code requirements and product standards and labels.

Executing Entity/Implementing Partner: UNDP
Implementing Entity/Responsible Partners: President's Deputy for Science and Technology (PDST) – Committee for Energy Efficiency and Environment (CEEE)

Brief Description

The objective of this project is to transform the energy efficiency of heating systems in buildings in Iran, resulting in an invigorated sector in which skilled and well trained engineers fit / retrofit efficient and low carbon heating systems in residences and other buildings, as required by demanding, well enforced building codes - thereby reducing heating bills for residents and national GHG emissions It is envisaged that this will be achieved by (i) reviewing the legislative, policy and regulatory frameworks that impact building efficiency in Iran; revisiting the building code and products standards and labels and developing a supportive cross-sectoral energy efficiency strategy; (ii) piloting installations of energy efficient and renewable energy measures in existing buildings; and (iii) transforming the market by: training manufacturers and building professionals to produce and install energy efficient heating systems; developing a stakeholder awareness-raising campaign and developing proposals for financing mechanisms for households.

Programme Period:	2016-2020
Atlas Award ID:	63735
Atlas Project ID:	80660
PIMS #	4018
Start date:	August 1, 2016
End Date	December 31, 2020
Management Arrangements	National implementation

Total allocated resources:	**$32,516,760**
• GEF:	**$4,000,000**
• Co-financing:	
○ PDST	28,391,760
○ UNDP	$125,000
Total co-financing:	**$28,516,760**

Agreed by (Government): _____

Date/Month/Year

Agreed by (UNDP): _____

Date/Month/Year

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ACRONYMS

AEEE	Authority for Energy Efficiency and Environment at President's Deputy for Science and Technology
BEO	Barrel of Oil Equivalent
CEO	GEF Chief Executive Officer
CEEE	Committee for Energy Efficiency and Environment at PDST
CO	UNDP Country Office
CSSAP	Cross-sectoral Strategy and Action Plan
CO_2	Carbon dioxide
DOE	Department of the Environment
EE	Energy Efficiency
GDP	Gross Domestic Product
GEF	Global Environment Facility
GHG	Greenhouse Gas
HQ	UNDP Headquarters
IFCO	Iranian Fuel Conservation Organisation
INSO	Iran National Standards Organisation (INSO)
kgoe	Kilogram of oil equivalent
LPG	Liquid Petroleum Gas
M&E	Monitoring and Evaluation
MHUD	Ministry of Housing and Urban Development
MoE	Ministry of Energy
MoP	Ministry of Petroleum
MoRUD	Ministry of Roads and Urban Development
MYFF	Multi-year Funding Framework
NGO	Non-Governmental Organisation
ORU	Ordinary Residential Units
QPR	Quarterly Progress Report
PDF	Project Development Facility
PDST	President's Deputy for Science and Technology
PIR	Project Implementation Review
PMU	Project Management Unit
PMT	Project Management Team
PSC	Project Steering Committee
RCU	UNDP Regional Coordination Unit
SABA	Iran Energy Efficiency Organization
SFD	Social Fund for Development
SRF	Strategic Results Framework
SUNA	Iran Organization for Renewable Energies
SWH	Solar Water Heater
TPR	Tripartite Review
TTR	Terminal Tripartite Review
UNDAF	United Nations Development Assistance Framework
UNDP	United Nations Development Programme
UNFCCC	United Nations Framework Convention on Climate Change

1. SITUATION ANALYSIS[2]

General Country Background

1. The Islamic Republic of Iran has a population of 73 million, making it one of the most populous countries in the Middle East and North Africa Region. It has the second highest GDP in the region, though in per capita terms it is ranked close to the middle. Nonetheless a middle class has clearly emerged in the country and over the past decade, Iran experienced on-going economic growth. The population is relatively young.

2. Recent decades have witnessed the country undergo rapid urbanization, with 70% of the nation now living in urban areas. This, taken in conjunction with the demographic trends above, will result in a growing annual demand for energy under a business-as-usual scenario. Without intervention, this will result in ever-higher GHG emissions.

Energy and building stock situation

3. Currently, among the countries eligible for GEF support, Iran ranks fifth in terms of CO_2 emissions. At 23%, the residential and commercial building sectors are one of the largest contributors to emissions in the country.

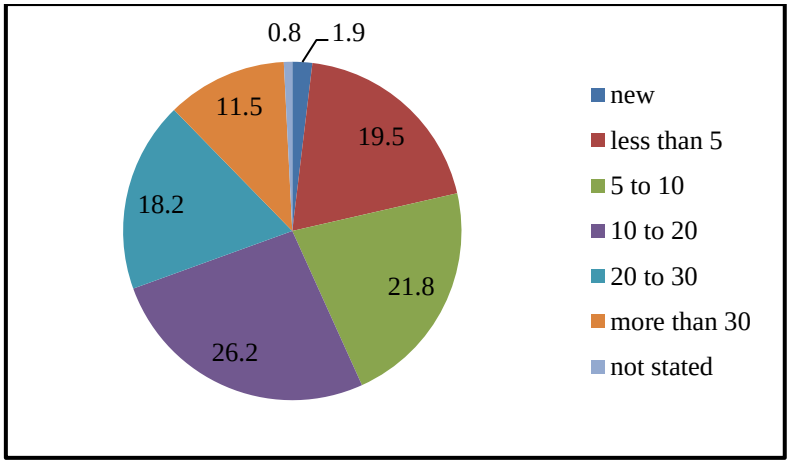
4. Iran's share of primary energy consumption in the buildings sector (i.e. combined residential and commercial sub-sectors) amounts to 40% of total primary energy supply. CO_2 emissions from the buildings sector grew by 4.3% in the period 1994-2000. The global figure was 2.7%. In 2000, Iran's building sector emissions stood at 85Mt CO_2, compared with 73Mt from the transport sector, 55Mt from industry and 11Mt from agriculture.

5. A review of Iran's Building Stock by the Sharif Energy Institute at the Sharif University of Technology that made use of extrapolated 2002 data from the Statistics Center of Iran on places of economic activity (not household activity) shows that 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.

Residential building stock

6. The Statistics Centre of Iran has collated data on the number of residences (known as ordinary residential units - ORUs) over the last 5 decades. The shift from rural to urban living over the years is notable. However, the data should also be looked at in the context of the growing total number of dwellings across Iran. For example, in 1956 there were a total of 4.0 million ORUs across the country, 1.3m of which were in urban areas and 2.7 million of which were in rural areas. By 2006 the total number of ORUs had grown to 15.9m, of which 11.4 million were in urban areas and 4.4 million were in rural areas – a rise of 1.7 million in rural areas in 50 years despite the general transition towards urban areas. Regarding building age, more than 43% of residential units are less than 10 years old. Figure 1, indicates ORUs age in years in Iran.

[2] See Annex E: Iran Policy Overview for further background.



(ORUs, Age, 2006; Source: Statistics Centre of Iran)

Figure 1: Age of Ordinary Residential Units in Iran

7. On average, the floor area of an ORU is 104m^2, with larger dwellings existing in urban zones. Demolition rates fell between 1988 and 2001, though in absolute terms construction rates have been increasing over the last 3 years. According to the Vision Plan in the run-up to2025, the goals for annual urban and rural construction growth rates are 4% and 7% respectively, as the Government aims that every household in Iran will have its own residential unit. In order to achieve its Vision Plan 2025, Iran has set the quantitative goals for the 5th development program in dwelling and construction as follows:

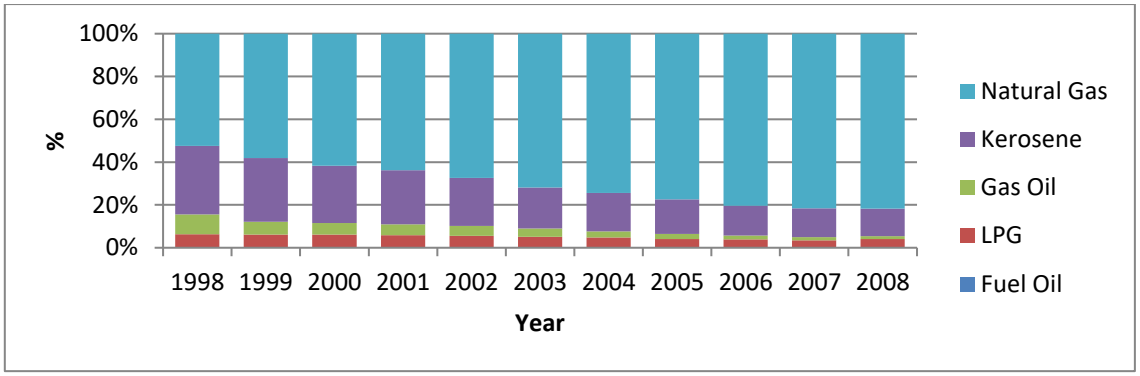
Quantitative Goals of 5th Development Program in Dwelling Section, 2010-2014

	Unit	2010	2011	2012	2013	2014
Annual Construction	Thousand Unit	850	910	970	1,050	1,100
Annual Construction	Million Square Meter	100.30	105.56	110.58	117.60	110.00
AFA of Dwellings	Square Meter	118	116	114	112	100
Household Intensity	Household/Unit	1.075	1.07	1.065	1.06	1.055

Source: The Ministry of Roads & Urban Development

Energy use in buildings

8. The dominant energy carrier in Iran is natural gas, for which there are three main end-uses in the residential sector: space heating (65.4%), water heating (28.8%) and cooking (5.85%) (% split estimates are from the Sharif Energy Research Institute, 2001).



(Share of Energy Carriers in Residential Section, 1998- 2008 (Data Source: The Ministry of Petroleum)

9. Using their assumptions on the number of ORUs and natural gas consumption in the energy sector, the Sharif Energy Research Institute were able to develop estimate annual energy usage for each energy carrier across main residential activities.

Annual Average Energy Usage (kWh/m^2) for Each Energy Carrier in Activities

Energy Carrier	BOE/ORU	kWh/m^2	Space Heating	Water Heating	Cooking
Natural Gas	14.33	234.06	153.07	67.41	13.58
Kerosene	2.49	40.61	32.32	8.20	0.08
LPG	0.69	11.25	5.75	5.11	0.39
Gas Oil	0.33	5.40	3.63	1.76	0

Data Source: Energy Consumption in Residential Section, Sharif Energy Research Institute. (SERI)

10. Climatic conditions are clearly an important factor in energy consumption. The annual specific energy consumption in the residential sector of Iran in 2007 was 245 kWh/m^2 in the moderate climatic regions, and 582 kWh/m^2 in cold regions (IFCO, 2007). 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. In 2006, the total energy consumed in Iran's residential and commercial sectors totalled 490.63 MBOE – about 2.5 times higher than the comparable global average.

Energy and Environmental Policy

11. Iran's long history of environmental focus is evidenced by the establishment of the Department of Environment (DOE) in 1974 as an inter-ministerial authority. The DOE currently presides in the Office of the President, and is one of the oldest and strongest authorities in the developing world. Iran's National Climate Change Office was established in January 1998 under the auspices of the DOE with support from UNDP/GEF. Among other responsibilities, the Office has built national capacity to systematically address climate change issues.

12. Iran's national priorities concerning energy and environment are reflected in the following:

- 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.
- The Environmental Protection and Improvement Act (1974) calls for both preventive and remedial measures for the protection and rehabilitation of the environment.
- The Common Country Assessment (CCA) states that one of the country's goals is to increase energy efficiency and reduce air pollution.

- 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
  - Increasing the share of renewable energy sources

13. The highest level strategic direction of Iran is set by a document called Vision Plan 2025. The vision set out in this document is the basis for a set of five year development plans (5YDPs), which include more tangible targets and guidelines. Vision Plan 2025 includes the requirement to reduce energy waste, moving toward a coherent structure and integrated system for managing supply and demand, reducing energy intensity and diversifying energy sources, including increasing the energy share supplied by renewable energy technologies. In the second 5YDP residential energy efficiency is addressed in Article 19 Section 6, whereby government has to allocate 0.2% of total income from the sale of energy carriers to energy efficiency programs, such as auditing and the standardisation of energy consuming devices. Energy efficiency is further addressed in the third 5YDP, Article 121, which is expanded and implemented in Article 20 of the 4th 5YDP. Together these oblige the Government to provide:

    - Standards and measures for energy using appliances and systems and require manufacturers and importers to comply with them; and,
    - Rules and regulations for energy consumption standards in the design and construction of buildings to reduce energy waste and to design and implement incentive programs to improve the energy efficiency of the existing building stock.

14. Responsibility for the formulation and implementation of the energy policy is split among a number of Government departments and their agencies; the key organisations related to the areas of interest to this proposed project are:

    - The Committee for Energy Efficiency and Environment (CEEE) under the President's Deputy for Science & Technology (PDST) is a supreme coordinating authority that aspires to create synergy and develop capacity across all relevant sectors involved with energy efficiency (EE). CEEE crafts strategies that are conducive to innovative knowledge/technology-based solutions in the EE realm. Main mission of CEEE comprises: 1) Achieving goal congruence in the energy efficiency domain in close collaboration with the Supreme Energy Council as well as all sectors concerned with EE; 2) Barrier identification and removal as well as support of market-oriented EE solutions and helping to balance supply and demand for EE measures; 3) Supporting the network of EE private sector concerns vis-à-vis financing needs and fulfilling their information requirements through generation of requisite data/information; 4) Reducing innovation risk and safeguarding intellectual EE-related knowledge; 5) Providing support in incubation and diffusion of new EE technologies for the network of technology providers and universities; 6) Awareness-raising; and 7) National and international collaboration on science/technology-based approaches to EE.
    - The Ministry of Petroleum (MoP) is accountable for fossil fuel supply and use. Their subsidiary, Iran Fuel Conservation Organization (IFCO), leads the Ministry's actions on improving energy efficiency and increasing renewable energy market share within the fossil fuel realm. MoP's Deputy for planning is another important sub-set of relevance to policy-making and execution.
    - The Ministry of Roads and Urban Development, (MoRUD), through its Building and Housing Research Center (BHRC) is responsible for building standards through national building regulations.

- Iran National Standards Organisation (INSO) is the Iranian governmental institution for standard development and certification. INSO works closely with the Ministries of Petroleum and Energy on development of energy standards.

All these organisations are working to improve energy efficiency in accordance with the relevant articles in the 5YDPs.

15. BHRC has introduced a National Building Regulation on energy efficiency. This document is referred to as Chapter 19. It sets maximum energy consumption in new buildings taking into account the climatic zone, building's usage and heated floor area, and it's location (in a small or large city). The main focus of Chapter 19 is on the building envelope and aspects such as occupants, equipment, lighting and solar gains have not been included. Also the building is considered as a single thermal zone with constant temperature assumed; air circulation and ventilation are not considered. The code became compulsory in 2000 for construction of all new buildings. However the impacts of Chapter 19 have been reduced by limited compliance.

16. Both SABA and IFCO have initiated auditing of energy use of Government buildings in Iran. SABA has audited electricity use with IFCO auditing fossil fuel use. Raising public awareness and providing educational programs has largely been undertaken by IFCO, with additional information dissemination activities undertaken by the Ministry of Energy. Established in 2000, IFCO is a relatively young organization, and its project-based and piecemeal efforts so far have not yet resulted in substantial market transformation where significant energy savings in the residential or commercial sectors would be realised.

17. Beyond the scope of these ministries, energy subsidies have affected energy use over the last decade. By setting an artificially low price for energy, the incentives for reducing energy use has substantially diminished. This was recognized as being one of several issues with such subsidies (including the uneven economic distribution of such subsides) with Article 126 of the Fourth Plan demanding an annual review of energy prices. In January 2010 the Iranian Parliament agreed to a bill to increase energy prices, with the first change taking effect on 19th December 2010, with the intention of phased and stepwise price increases over a five year period. The first price changes amounted to a substantial up-front increase with percentage increases for domestic (non-transport) fuels of between 260% (average) for electricity and 2000% for fuel oil. To date (2016) it is too soon to make an assessment of the long term impact that "nominal" price changes will have on energy demand.

Energy use in Buildings

18. Major contributing factors to the building sector's high energy intensity include:

- The low price of energy in the past, heavily subsidized up to 2010, in particular for households. Subsidies were recently substantially decreased; however, building practices have not yet been amended to accommodate this new reality.
- Poor insulation of the building envelope and lack of adherence to good energy efficient practices in construction;
- Energy inefficient heating and water heating systems and appliances and other inefficient household appliances;
- Poorly designed and maintained central boiler rooms and central heating systems;
- Under-usage of renewable energy, especially solar, for heating and water heating;
- Inadequate implementation and enforcement of Iran's building energy code and the need for the code to be updated;
- Low public awareness of energy efficiency and a lack of a coordinated, cross-sectoral energy efficiency policy;

- Insufficient training and understanding, especially among building professionals, of the principles of energy efficient building and heating system design and operation; low awareness, among professionals and the general public, of the economics of energy efficiency and the impact of energy use on climate change.

The characteristics of the main heating systems used in Iran are given in the table below:

Application	Type	Fuel	Part	Size Range (kcal/hr)	
				Max.	Min.
Space Heating	CHS	Natural Gas & Gas Oil	Burner	n/a	25,800
			Boiler	714,000	23,900
			Water tank	4000 Lit.	300 Lit.
			Radiator	4,544	80
	Packaged	Natural Gas		40,000	20,000
		Gas Oil			
	Heater	Natural Gas		12,000	3,600
		LPG			
		Kerosene		10,000	2,500
		Electricity		1200 W	1000 W
Water Heating	Water Heater (With Storage)	Natural Gas		22,000	11,000
		Kerosene			
		Solar Energy		200 Lit.	120 Lit.
		Electricity		2500 W	2000 W
	Water Heater (Without Storage)	Natural Gas			
Cooking	Stove	Natural Gas		8,000	900
		LPG			
	Other	Electricity			

19. The average per capita energy consumption in 2004 was 850 kgoe. However, this average conceals marked differences in consumption between urban and rural areas on the one hand and within these areas themselves on the other. About 30% of the energy was used by industry, 24% by transport sector, 33% by households and services and 12% by non-energy uses.

20. Energy systems in Iran predominantly constitute central boiler rooms. It is estimated that there are 1 million boiler rooms nationwide, 30-40% of which can be found in Tehran. They are controlled manually and provide individual solutions for each building.

21. Regardless of the size of the system, these gas-fired systems are built to the same technical standards. The systems are used to provide both domestic hot water (DHW) and space heating. They include a complex array of valves, pumps and thermostat set points each requiring changes and adjustments. On the whole, boiler rooms are not well maintained, as the concept of maintenance for enhanced performance is not pervasive. Furthermore, there is a shortage of suitably skilled human resource and a lack of monitoring equipment, making it difficult to identify faults carry out the work. Such systems could therefore be amenable to simplification and would be more appropriately managed by automatic intelligent controls.

22. The main issues, and some potential solutions, which will be implemented by this project (where appropriate and cost effective) are listed in the table below. This information is based on the project scoping research conducted by the Sharif Energy Research Institute at the Sharif University of Technology. The main causes of energy losses in boiler rooms are summarized in the table below:

No.	Causes/Reasons	Energy Loss (%)
A	Connectivity of CHS & DHW	10
B	Deposit	12
C	Manual Control	20 – 40*
D	Boiler & Burner Mismatch	5 - 10
E	Lack of Insulation	10 – 12*
F	Enormous Draft in Stack	30-35
G	Burner Misalignment	~10%

23. **A. Connectivity of CHS & DHW**: Boiler room systems are built in such a way that both the central heating system (CHS) and DHW are operational, even when there is only a need for hot water. This would remain the case even if the heat circulation pumps are shut off.

    Technical solutions: Two solutions to this problem have been considered in the project scoping research. ***Firstly*** the single boiler could be replaced by two separate boilers, one for DHW and the other for CHS. However this has been assessed as impracticable given space and cost constraints. ***Alternatively***, electric valves can be installed on CHS risers in order to control the circulation of water for space heating throughout the building. In the latter situation an intelligent control system would block water paths using electric valves when there is only a need for DHW. As well as being more cost effective, electric valves have minor exposure to deposit and the human capacity needed for installing and maintaining this technology exists in Iran. Experiments show that installing electric valves on CHS risers and temperature regulation using an intelligent control system can result in 35% energy savings in residential buildings. The expected energy savings from this solution in non-residential buildings is around 20%.

24. **B. Deposit**: The deposition of calcium, magnesium and other deposit materials on jackets and pipes reduces the rate of heat transfer and results in inefficient operation of CHS burners. For example, a 5mm calcium carbonate deposit reduces system efficiency by 12%. In addition, deposits in pipes, fixtures, faucets and similar equipment reduces pressure in the distribution system resulting in increased demand on and increased energy demand of circulator pumps, reducing system efficiency.

    Technical solutions: Removing calcium and magnesium or other deposit-forming materials from the water feed before they enter the boiler system, and washing or flushing deposit materials from the boiler and pipes.

25. **C. Manual control**: Each boiler room has a great number of valves, pumps and thermostats. Such complexity makes systems difficult to optimize, especially when there is a lack of trained operators, as is currently the case in Iran. In most residential buildings, thermostat set points and pumps and valves settings are fixed (set at the same values for the whole year), even though adjusting these throughout the year would result in a substantially improved operation of the system. For example, a reduction of the ambient room temperature by 1 degree centigrade will result in a 7-8% energy use reduction.

    Technical solutions: Two solutions have been identified: 1) the installation of thermostatic valves on radiators, and 2) installing intelligent control systems for boiler rooms. By installing thermostatic valves on radiators, the temperature in rooms can be controlled automatically. By installing thermostatic valves, automatic flow control through the radiator can adjust the room temperature to between 8 to 28 ºC. Research has

indicated that the use of thermostatic valves can result in at least a 20% cost saving for households. For effective use of thermostatic valves, variable speed drives must also be installed on circulator pumps. ***Alternatively***, intelligent control systems can be used. These analyse heat demands as well as outdoor temperatures, and adjust boiler water temperatures in real time to reduce heat losses. By increasing the efficiency of boiler rooms, this system increases longevity of facilities and decreases operation and maintenance costs. In addition, it reduces peak demand for the gas grid. Expected energy savings of this solution are up to 40% for non-residential buildings, with similar savings expected in large residential buildings.

26. **D. Boiler & Burner Mismatch**: Boiler systems suffer from a mismatch of boiler size and burner capacity as boiler manufactures do not fabricate integrated boiler/burner systems and the onus of burner selection and procurement is with boiler room technicians, who may not be trained in the optimal matching of boiler and burner***.***

27. **Technical solutions**: In Iran, experiments have shown that in most cases tuning the burner up and adjusting the burner flame will solve this issue. Due to longer hours of operation in residential buildings, this solution has more expected energy savings in residential buildings than in non-residential units. ***Alternatively,*** the market can be transformed to mandate manufacturers to build integrated boiler/burner systems.

28. **E. Lack of insulation**: Lack of insulation of CHS components such as boilers, collectors, pipes and expansion tanks is one of the most persistent problems in CHSs in Iran. For instance, trials conducted with expansion tanks indicate that the heat loss from un-insulated expansion tanks is around 0.4 kWh/l tank volume.

    Technical solutions: The solution to this issue is to insulate all bare surfaces as far as practicable. For example, in expansion tanks, up to 75% reductions in expansion tank heat losses are achievable through complete insulation of the tank, or replacement with an insulated tank. Furthermore, insulation of hot water pipes reduces heat loss by around 10 to 12%. In Iran, as elsewhere, insulation is a highly cost effective method to yield energy savings, and is easy and quick to install.

29. **F. Enormous draft in stack**: This originates from the unsuitable design of many stacks. For example, the stack height or diameter may be too large, resulting in an enormous draft in the stack. The magnitude of heat losses is dependent on the temperature and volume of gasses leaving the boiler. In some cases, the opposite happens – inadequate draft in the stack is a health risk. Carbon monoxide emissions, soot and unburned gases are the results of inadequate draft. Each of these phenomena reduces efficiency. For instance, a soot layer of 0.8mm decreases heat transfer by around 9.5%.

    Technical solutions: The scoping research identified five solutions for reducing draft in the stack: draft hoods, barometric dampers, damper motors, vent dampers or repairing the stack structure. Each option has a number of advantages and disadvantages, and the optimal solution is dependent on the situation in each building. All solutions will be included in the project, with installers and other building sector professionals guided as to which solution to choose for a specific setting and how to apply it.

30. **G. Burner misalignment**: Due to the lack of maintenance of boilers and burners, and sometimes due to poor installation, burners are often misaligned in boilers. This leads to loss of heat and boiler efficiency, typically up to around 10% (although it can be higher in exceptional cases).

    Technical solutions: This can be fixed by a burner tune-up, using a measurement tool to assess the proper function of the burner and re-aligning the burner if needed.

31. The project will demonstrate the technical solutions, individually and in suitable combinations, through select pilots. In addition, the project will build capacity for the implementation of these solutions through its market transformation component.

Barriers to reduced energy building use

Barriers to the widespread applications of energy efficient technologies in buildings have been assessed through baseline research and discussed with stakeholders in a Log Frame workshop (see Annex F: Problems Analysis and Solutions List). The resulting barrier analysis is presented in Fig. 2. Each of these barriers is described below in turn (in priority order). The project is designed to address all these barriers.

32. 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, reducing cost effectiveness and causing confusion with stakeholders, with the risk of reducing credibility of policy.

33. **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. Effective co-ordination and collaboration with clear responsibilities are essential to move cost-effectively and to communicate clearly and effectively with all stakeholders, professional and the public.

34. **Low technical quality of heating systems** (very high priority): This is the core problem for this project. 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.

35. **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.

36. **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 (i.e. Chapter 19) 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). Efficient codes that are enforceable and economically viable can move the entire sector onto a more efficient curve. Without them, most designers and builders will lack incentives to produce more efficient buildings. The same issues apply to heating products – MEPS can remove the least efficient products from the market, greatly reducing energy use. Energy labels can provide the incentive to manufacturers to produce and for customers to buy, more efficient products.

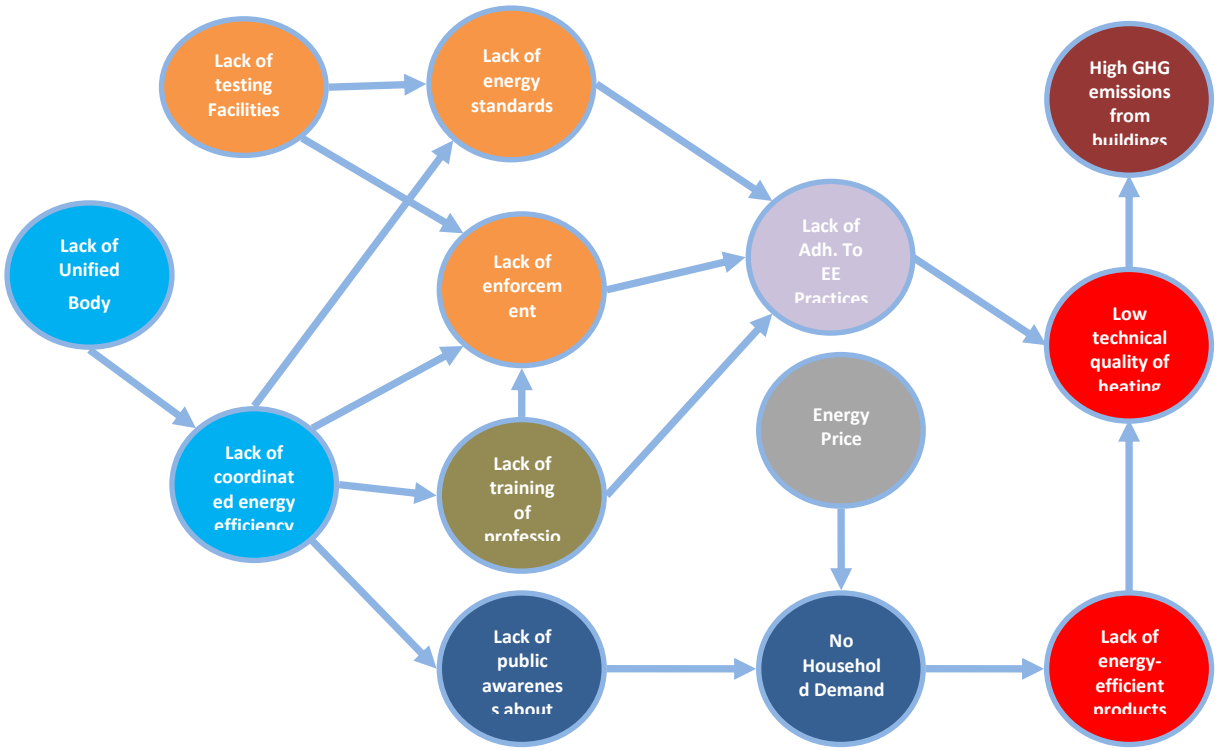


Fig. 2: Inter-relationship of Barriers

37. **Lack of training of professionals** (very high priority): Levels of training are low, and training on energy issues, at a technical and professional levels, is very limited. Architects, builders, boiler room engineers, and window fitters all need training, ideally with accreditation. Policy implementation is critically dependent on the skills and resources of the building and heating supply chain3 to implement them.

38. **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.

39. **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.

40. **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.

41. **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 are set to reduce further over the next few years. Artificially

[3] For details of the supply chain for boilers and other heaters please see Annex J

low prices make EE measures less economically viable than they actually are, thus making them less attractive to consumers.

42. **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.

43. **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.

2. STRATEGY

Project Goal, Objective, Components and Outputs/Activities

44. The project intervention is presented according to the logical framework approach. The essence of this approach is that each component has an overall outcome and the outputs in each component contribute to the realization of each outcome. The realization of the outcomes in all components of the project brings about the achievement of the project objective. The realization of the objective/purpose of the project contributes to the achievement of the project goal. The envisaged project components following this approach are briefly discussed below, with further details in the Log frame Matrix of Section 3.

45. The goal[4] of the project is the reduction of greenhouse gas emissions in the building sector in Iran. This project is consistent with the GEF-5 Focal Area Strategy of "Climate Change Mitigation". The objective is to achieve this through legislative, policy and regulatory reforms and implementation of cost-effective mitigation measures as well as increasing the share of distributed renewable energies (specifically solar water heaters) to meet the energy requirements of new buildings and existing stock.

46. The goal of this GEF project is the reduction of GHG emissions from Iran's buildings sector 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. Space and water heating have been shown to be the largest component of building energy demand and very significant cost-effective energy saving opportunities have been identified. With rising energy prices it is particularly urgent and important that these measures are introduced to the Iranian building stock. Due to a history of very low energy prices and lack of attention to heating system performance both the vast majority of building owners and heating system engineers are unaware of the energy wasted through inadequately performing systems.

47. The GEF project will also identify and implement cost-effective market transformation measures in an effort to achieve long-term sustainability and GHG mitigation within the building sector. The pilot aspect of the project will focus on the heating systems of public and residential buildings in Tehran.

[4] This is based on the definition of the project goal as “the overall result to which the project will contribute, along with various other, external interventions”.

48. The project will apply the approaches identified in UNDP's "Global Framework for Promoting Low Energy Buildings". These include components dealing with the first three "thematic approaches" of the global framework, namely:
    - Improving the Knowledge, Understanding and Visibility of the Energy Efficiency Performance of Buildings and their Carbon Emissions
    - Promotion and increased uptake of High Quality Energy Building Codes and Voluntary Building Energy Efficiency Standards
    - Promoting Energy Efficient Municipal and Other Public Buildings

49. The project employs a combination of legislative, standardization, demonstration, and dissemination, training and marketing activities to initiate the market transformation of building heating systems in Iran. Key components of the project are further described below.

50. The project is focused on effecting long-term, sustainable change. The focus on market transformation is deliberate, and in line with GEF strategic objectives and priorities under the climate change focal area. The foundations of the project lies in addressing legislative, policy and regulatory frameworks and demonstrating the energy savings available through the implementation of cost-effective technical measures in a sample of existing building stock. These components will support and sustain the market transformation strategies which will focus on capacity building and engaging and harnessing Iran's commitment to energy efficiency (See Annex I: Background to Market Transformation Strategies for further information).

Project Components and Outputs

51. **Component 1: Legislative, policy and regulatory frameworks**: This component will focus on introducing the legislations, policies and regulations that will drive the market towards better designed buildings and heating system products. The project will work with the relevant government departments in updating the existing building code to include space and water heating system requirements as well as more stringent requirements for the energy performance of the building shell. The expected outcome of this component is that key laws, policies, strategies, regulatory documents, frameworks and studies are approved 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.

52. Building code revisions, brought in by BHRC of the Ministry of Roads and Urban Development, supported by the project, will require that new buildings meet minimum performance standards (MEPS) requirements for heating system energy performance as well as more demanding building shell energy requirements. Through minimum energy performance standards and energy labels for space and water heating system products, the project will transform the market for space and water heating products in line with better energy performances. New test procedures will be introduced as needed to support the building code and energy standards and labels.

53. In addition to these direct interventions in buildings and heating system products markets, the project will also, in collaboration with all relevant government departments, analyse the existing policy framework for energy efficiency and develop and introduce a cross-sectoral energy efficiency strategy and action plan (CSSAP). This will address gaps and overlaps between the policies of the various departments, align resources and initiatives and generally maximize the impact of government policy for transforming the building and heating systems markets to more energy efficiency.

54. The CSSAP will delineate the most cost-effective and relevant policies and means of implementation in the Iranian context. Such policies are broadly categorized as:

- Control and regulatory instruments (e.g. building codes; mandatory labelling and certification programs; Minimum Energy Performance Standards - MEPS);
- Economic and market-based instruments (e.g. encouraging energy performance contracting through ESCOs; EE certificate schemes etc.);
- Financial and fiscal instruments and incentives (e.g. carbon tax; tax exemptions or accelerated depreciation; reduction in custom tariffs; capital subsidies; grants; rebates; subsidized loans etc.);
- Support, information and voluntary action (e.g., voluntary certification and labelling, free of charge audits, mandatory audit and energy management requirements, etc.);
- Enforcement strategies and mechanisms for compliance with building code requirements and product standards and labels;
- Research and development support (e.g. improved national and international collaboration; encouraging private sector involvement, etc.);
- Education programs and information campaigns (e.g. research on consumer behaviour; consumer targeted information; educational activities, etc.);
- Engagement with the Green Climate Fund (e.g. creating regulatory framework; preparation and dissemination of publically available information).

55. Finalization of and agreement on the CSSAP will allow the project to focus on the implementation of the most important and cost-effective measures.

56. The specific outputs under this component are:

- Output 1.1: A completed review of baseline energy policy, building energy regulations, heating product standards and labelling frameworks that impact building energy efficiency in Iran and comprehensive gap analysis.

  - *Activity 1.1.1: Prepare an overview and assessment of current policies, regulations, standards and labelling frameworks that affect energy efficiency in buildings. Compare and contrast the national energy efficiency policy, regulatory and standards & labelling frameworks on buildings to international best practice. This is an incremental activity.*
  - *Activity 1.1.2: Conduct a comprehensive comparative review (by a Review Committee that will comprised of national and international experts) of current policy, regulations, standards and labelling frameworks. This will also involve the preparation of a comprehensive report, complete with recommendations for change that the relevant government agencies shall take into account in line with international best practice. This is an incremental activity.*

- Output 1.2: Revised (where necessary) policy and regulatory frameworks, in particular the thermal energy performance requirements stipulated in the existing building code, that addresses heating system applications and efficiency and standards and labels for heating products

  - *Activity 1.2.1: Prepare mandatory national codes for the thermal performance of buildings and building components, calculation methodologies and code implementation procedures, including a timetable for phasing in code requirements, the stages of the building life cycle that will be covered, and a proposed scope for the code. The building code should aim to cover heating system efficiency, multiple thermal zones, air flow, solar gains and humidity where possible. This is a modified baseline activity.*

- *Activity 1.2.2: Develop new energy standards and labels for heating products used in buildings. This is an incremental activity.*
- *Activity 1.2.3: Gather, evaluate, and provide supporting information on suitable technologies and products that meet the requirements of the updated code (e.g. insulation and building construction materials; energy saving construction technologies, etc.) This is an incremental activity.*
- *Activity 1.2.4: Design, develop and launch a (voluntary) energy performance certification and labelling scheme for construction materials and relevant heating products with the aim of providing incentives for the production and utilization of high-performing products. This is an incremental activity.*

- Output 1.3: Enforcement strategies and mechanisms for compliance with building code requirements and product standards and labels

  - *Activity 1.3.1: Develop effective national compliance strategies, and establish accountability for enforcement. This is an incremental activity*
  - *Activity 1.3.2: Set up a mandatory training scheme for accredited building practitioners (e.g., architects, engineers, developers/contractors) covering building code requirements by the end of the project. This will involve training senior engineers/academicians/trainers to deliver the training. This is an incremental activity.*
  - *Activity 1.3.3: Assess the capacities of existing product testing laboratories to perform certification according to the new standards/ labels and select at least 2 as project partners. Develop a work program to expand the testing laboratories and testing capabilities in order to meet the requirements of an effective compliance system. Accredit, equip and train these laboratories to handle product performance testing and certification of EE building products. Provide on-going technical assistance to these facilities. This is a modified baseline activity.*
  - *Activity 1.3.4: Design, build and operate 3 test laboratories, for boiler room components, solar water heaters and gas-fired appliances. This will involve development of specifications for the laboratories, procurement of testing equipment, training of staff, trail runs of the laboratory and comparative testing with an internationally recognized laboratory. This is a baseline activity.*
  - *Activity 1.3.4: Pilot compliance strategies in two regions, working with municipal authorities to improve compliance with building code requirements. Evaluate after two years. This is an incremental activity.*
  - *Activity 1.3.5: Develop a national compliance work plan, building on lessons learnt in training, testing and pilot regions. Discuss work plan with the relevant Ministries and municipalities and agree an implementation plan. This is an incremental activity.*

- Output 1.4: A supportive cross-sectoral energy efficiency strategy and follow-up action (CSSAP) to streamline its provisions in the sixth five year development plan complete with clear institutional roles, coordination at central and local government levels, and addressing public awareness and professional education.

  - *Activity 1.4.1: Development of a cohesive CSSAP that includes priority actions based on most cost-effective and relevant policies, with clear implementation steps, coordination arrangements among key players/stakeholder in the national and local governments, and clearly delineated roles and responsibilities. A representative team, with members from across government and other relevant stakeholder institutions, will be established for this purpose. This is an incremental activity.*
  - *Activity 1.4.2: Monitoring and evaluation to assess the progress of CSSAP's implementation by an established, accountable, cross-governmental team. This is an incremental activity.*

57. **Component 2: Pilot installations of EE and RE measures in the existing building stock**: A total of 330 privately owned residential buildings and 80 Government-owned buildings in and around Tehran would act as pilot. Tehran is a major metropolis representative of colder climate. Pilot implementation will entail actual mitigation measures focusing on hot water and space heating. These two end uses have high energy demands in the cold climate areas of Iran. Potential measures will also include the retrofitting of heating systems and insulation of thermal bridges around windows as well as installing double glazing. Solar water heaters (SWHs) will also be installed and integrated with retrofitted heating systems. Collaboration with heating system engineers and manufacturers is included in the project in order to build capacity and root out energy inefficient practices and equipment. The expected outcome of this component is improved heating systems and integration of SWH systems in privately owned residential buildings and government-owned buildings.

58. Following the pilot installations, an evaluation will be conducted and results disseminated so that projects can be replicated elsewhere and policy makers can draw lessons. Heating system professionals will also be involved in the dissemination of results, and guidelines and training materials will make use of the evaluation process.

59. The selected pilots fit in the wider market transformation approach of the project, and build on past work in Iran. For example, recently, the CEEE, in conjunction with a consortium of private sector companies, has implemented a programme comprising of 200 residential units. The latter pilot consists of innovative features and has been diligently monitored for lessons learned. In addition, past MoP pilot efforts targtting its own official buildings, this has resulted in a standard approach that can be rolled out as part of MoP's regular work program. These experiences could be transferred to the residential sector, which, so far, has not been exposed to energy efficiency improvements. The pilot installations of energy efficient boiler room upgrades will test whether any changes are needed in technologies applied for residential buildings, and demonstrate the energy savings potential and energy cost reductions resulting from boiler room upgrades for this largest segment of the building stock. Results of the pilots will be widely disseminated and used in the training of professionals as well as public outreach, as per component 3 (i.e. implementation of market transformation strategies).

60. The specific outputs under this component are:

- Output 2.1: Completed implementation of demonstrations showcasing the application of cost-effective energy saving options in privately owned (330- tbd) and government owned buildings (80- tbd) to retrofit the heating system and insulation of select thermal bridges (e.g. double paned windows – 100). **NB: These numbers are subject to review during the project implementation. However, the GHG mitigation outcomes would remain unaltered, the numbers and the site of the pilots notwithstanding.**

    - *Activity 2.1.1: Assess selected privately owned buildings in Tehran, and coordinate the implementation of energy audits in these selected buildings. This is a modified baseline activity*
    - *Activity 2.1.2: Develop a strategic, cost-effective energy saving plan for each identified building. Saving measures will include retrofitting the heating system and insulating measures based on the results of the energy audit. The plan's ambition must at least match, if not exceed, the mandatory code revisions. This is a modified baseline activity*
    - *Activity 2.1.3: Evaluate the results of the pilot projects and provide input for the development of guidelines and training materials for retrofitting heating systems based on experience and results achieved from pilots. This is an incremental activity*

- Output 2.2: Completed installation of 85 solar water (ditto – please see NB above) heaters and their integration with the retrofitted heating system. Evaluation of demonstrations/pilots and dissemination of results to heating system professionals

    - *Activity 2.2.1: Assess selected public buildings in Tehran and coordinate the conduct of the energy audits of these buildings. This is a modified baseline activity*
    - *Activity 2.2.2: Develop a strategic installation plan in selected buildings based on international best practice, including planning for the procurement and installation of suitably specified SWHs. This is a modified baseline activity*

- Output 2.3: Completed and disseminated evaluation report on the results of the demonstrations to heating system professionals

    - *Activity 2.3.1: Develop demonstration plan following the pilot; including details of target audiences and key messages. Training will be given to those delivering demonstrations and presentations. This is an incremental activity.*
    - *Activity 2.3.2: Disseminate findings and results of the demonstrations on the application of SWHs to heating system professionals, based on the demonstration plan. This is a modified baseline activity*

- Output 2.4: Guidelines and training materials for retrofitting heating systems complete with drawings of new designs and boiler room specifications

    - *Activity 2.4.1: Develop the guidelines and training materials to be used in the training on heating system retrofits. This is an incremental activity.*

61. **Component 3: Implementation of market transformation strategies**: Transforming the market requires capacity to be built, skills to be developed and interest to be harnessed and engaged. The proposed market transformation activities are designed to effect such sustainable changes in the Iranian market. Capacity development involves education and provision of accredited training. The GEF project will therefore work closely with the private sector in providing this to all parties in the supply chain including architects, developers, heating designers and heating engineers (installation, and maintenance), as well as boiler and heating system manufacturers. By working in partnership with manufacturers, building professionals, engineers etc. a number of lessons will be learned which will inform the revision of legislative and policy frameworks (e.g. boiler specifications and construction requirements for the building code). The expected outcomes of this component are: 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.

62. The government has made intense efforts in raising public awareness on residential energy efficiency issues. This proposed GEF project will build on these efforts and seek to transform public perceptions and attitudes, thus increasing the potential for CO2 emissions savings in the future. Education provision will be a key component of the campaigns, as there is limited public knowledge about climate change in general, and SWHs in particular. Design of the campaigns will draw on best practices from countries with a high penetration of solar hot water heaters (such as Turkey and Japan), and adapt these to the Iranian context in this project.

63. The specific outputs under this component are:

- Output 3.1: Completed capacity development programs for manufacturers of heating system including specifications for improved boilers, burners, heat distribution systems and pumps.

    - *Activity 3.1.1: Undertake detailed assessment of heating system manufacturers' technical and production capacity to improve efficiency of their products – design, production lines etc. Develop a capacity building strategy for manufacturers, including targeted funding and training plans. The strategy will cover various training activities and exchange of information and expertise with foreign equipment producers. Relevant lessons from previous capacity development programs for heating system component manufacturers will be taken into account in the design of the program. This is a modified baseline activity*
    - *Activity 3.1.2: Develop and implement a supportive training scheme that focus on increasing engineering skills of Iranian manufacturers' R&D departments in line with modern energy efficient technologies. Training will be provided by international boiler technology experts, in possible collaboration with leading Iranian university experts/private sector. This is a modified baseline activity*

- Output 3.2: Completed capacity development programs for building professionals on implementation of heating system requirements according to a revised thermal building code and product standards, including 1,000 developers, heating system engineers, architects, builders etc.

    - *Activity 3.2.1: Undertake detailed assessment of the technical skills of stakeholders in the building supply chain and their training needs; Develop strategy for capacity development to include targeted funding and training plans. This is an incremental activity.*
    - *Activity 3.2.2: Implement training plan for at least 1,000 developers, heating system engineers, architects and builders. Training will focus on the design of energy efficient heating systems, component specification and selection, best practice installation of boiler room and other heating systems and operational and maintenance guidelines. This is a modified baseline activity.*

- Output 3.3: Completed training of a cadre of accredited boiler room engineers, equipped with necessary monitoring equipment to implement EE measures

    - *Activity 3.3.1: Develop a training program for boiler room engineers and system installers, covering both technical and practical skills required to implement EE measures. This is an incremental activity.*
    - *Activity 3.3.2: Implement training program for boiler room engineers, focusing on key principles of energy efficient boiler systems, selecting system components, installation guidelines, operational and maintenance requirements. It will also include training in the use of monitoring equipment for boiler and burner inspection and tune-up. This is a modified baseline activity.*
    - *Activity 3.3.2: Design and conduct surveys to monitor the results, quality, and impacts of the training program. This is an incremental activity.*

- Output 3.4: Completed mandatory courses (through various modalities such as e-learning) for different stakeholders in the building value chain on the revised thermal energy standards/requirements in the building code, delivered by professional associations, technical schools and Ministry of Labour courses and the setting-up of an examination and an accreditation body

- *Activity 3.4.1: Conduct training for professional associations, technical schools and Ministry accredited course leaders on heating system requirements of the new building code, practical ways to implement energy efficient heating systems, installation, operation and maintenance guidelines for new heating systems and boiler room retrofits. This is an incremental activity.*
- *Activity 3.4.2: Establish an examination program and accreditation body for the certification and accreditation of building professionals. This is an incremental activity.*
- *Activity 3.4.3: Identify different stakeholders in the building value chain, and assess their different training requirements. Develop different training modules for various stakeholder groups. This is an incremental activity.*
- *Activity 3.4.4: Design and conduct surveys to monitor the results, quality and impacts of training. This is an incremental activity.*

- Output 3.5: Completed stakeholder awareness-raising campaign including a public awareness campaign linking heating system retrofitting to lowering energy bills.

  - *Activity 3.5.1: Undertake a review of international best practices in the introduction of SWHs to residential and non-residential buildings. This is an incremental activity*
  - *Activity 3.5.2: Design and launch a multi-channel awareness raising campaign based on the results of the pilot and international best practices, to increase awareness of target audiences on the economic, environmental and social benefits of system retrofitting and other energy-efficiency measures. Assorted topics to cover could include EE, climate change and SWHs. The national campaign should be planned for at least 2 years, and local campaigns should last around 1 year. This is a modified baseline activity.*
  - *Activity 3.5.3: Commissioning of consumer surveys pre and post awareness campaign and design of other M&E measures. This is an incremental activity.*

- Output 3.6: Completed review of the features and requirements of naitonal and international financing schemes for EE initiatives. This could include existing domestic financing schemes in the country (e.g., Innovation Fund managed by the PDST, local banks) and those that are international (e.g., GCF, NAMA, etc.).

  - *Activity 3.6.1: Conduct research and evaluate existing financing schemes for the implementation of energy efficiency improvement projects. Prepare a comprehensive review report highlighting the procedures in accessing the various schemes, as well as advantages and disadvantages of each scheme. This is an incremental activity.*
  - *Activity 3.6.2: Develop and recommend potential financing options for the implementation of building heating system energy efficiency improvement projects, based on the review of sustainable financing schemes. This could be a specific funding window of the Innovation Fund. This is an incremental activity.*

- Output 3.7: Established and operational financial scheme for residential building owners (typical multi-unit blocks) and capacity development for select banks and financial institutions in assessing EE project financing.

  - *Activity 3.7.1: Based on Output 3.6, design the details and operating procedures for the implementation of sustainable financing scheme that will support transformation of the market towards energy efficient residential household appliances and equipment. For example, if this will be based on the PDST's Innovation Funds, details of the funding, financing mechanism and the implementing rules and regulations, have to be prepared. This is an incremental activity.*

- *Activity 3.7.2: Select the appropriate and suitable financial institutions for the implementation of the designed financing scheme. This is an incremental activity.*
- *Activity 3.7.3: Develop and conduct a capacity building program for banks and suitable financial institutions that are interested in developing and implementing similar financing schemes for residential building energy efficiency projects, including targeted funding and training plans. This is an incremental activity.*
- *Activity 3.7.4: Launch and implement the designed financing scheme with the selected partner bank/financing institution.*
- *Activity 3.7.5: Monitor and evaluate the performance and impacts of the implemented financing scheme.*

Project Indicators, Risks and Assumptions

64. Key indicators of the project's success are:

(a) Realised and projected reduction in average thermal energy consumption for space and water heating in new and existing buildings in Iran (residential and non-residential) by end of the project and the end of the project impact period (+10 years) compared to the average at the start of the project;
(b) Cumulative CO_2 reductions from new buildings to be built during project lifetime (2016-2020) against baseline;
(c) Nationally adopted CSSAP by end 2018;
(d) Number of successfully implemented demonstrations of the application of cost effective energy saving heating system retrofits and improved insulation systems by end-of-project;
(e) National adoption of a capacity building strategy for manufacturers, and building and design professionals; development of training program for boiler room engineers; development of training courses for key stakeholders in the building value chain; development of a stakeholder awareness raising campaign; a review of international best practices in the introduction of SWHs; and development of financial incentive packages for households and a capacity building strategy for banks and suitable financial institutions.

65. It is critical that amendments to the policy, legislative and regulatory frameworks are complementary, and that key stakeholders work together to achieve the project goal. See Annex D for a summary of stakeholder views on the project.

66. The project can be considered to face two categories of risks: external (policy related) and internal risks (risks inherent to the project implementation itself). A Risk Log can be found in Annex A.

67. External risks:

- *Low availability of the energy saving products.* This would mean that the demand generated by the project through greater public awareness, cannot be met. The project aims to increase the capability of local manufacturers to make higher efficiency products. If local supply cannot satisfy demand in the short term products can be imported.
- *Lack of public awareness of EE issues, 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. To remedy such scenario, the intention of the evidence-based focused public awareness campaign and the financial incentives strategy would be to encourage awareness and uptake.

- *Lack of suitable Government pilot buildings.* It may not be possible to find enough low efficiency Government owned buildings to meet the target of retrofitted systems in the pilot phase. However the Government owns a large number of buildings – so this is unlikely to be a problem.
- *Strong negative public reaction to the reduction in fuel subsidies.* If this occurs, the government could halt the process of subsidy reduction or even start to increase subsidies. However the Government is unlikely to change its mind on such a key policy which removes a non-progressive subsidy and encourages energy wasting behaviour.

68. The main internal risks are:

- *Inadequate cost effective energy saving measures for the pilot.* This risk is deemed very low, as the review of the current national situation suggests that there are extensive cost-effective energy saving measures. However if this does turn out to be the case, the expertise available through the involvement of both local and international experts increases the chances that cost-effective solutions will be found.
- *The risk of poor co-operation between project stakeholders*: There is a risk that there will not be sufficient co-ordination or agreement between the relevant stakeholders, including the Tehran Municipality, and private sector developers. To mitigate this risk, CEEE and UNDP will ensure the presence of a strong project steering committee 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 CSSAP that will be developed under the project will include clear institutional roles and coordination mechanisms.
- *Weak or delayed policy implementation*: There is a risk that the agreed policy, legislative and regulatory changes will not be implemented in an effective or timely manner. Lack of enforcement of more stringent energy efficient building codes is a particular risk. The project will seek to 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.
- *Low level of knowledge or interest amongst professionals*. This will prevent the necessary integration of energy efficiency in building design and operations. However 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.

Expected global, national and local benefits

69. The GHG reduction impact of the project has been estimated as follows[5]:

- Direct GHG emission reductions of approximately 1.0 Mton CO_2 over the lifetime of the investments.
- Indirect GHG emission reductions of up to 153 Mton CO_2 over the project impact period (2020-2029) relative to the baseline, of which approx. 153 Mton CO_2 are incremental savings (relative to the base case).

70. The main national and local benefits are expected to be:

[5] See Annex G: Incremental Cost Analysis and Annex H: Calculation of Direct and Indirect Project Impacts for further background

- Creation of a favourable enabling environment that will create the conditions necessary for self-sustained replication of building energy efficiency measures and practices in Iran;
- The CSSAP, along with the revised policies and regulations, will serve as the foundation upon which all future EE building initiatives will be based.
- Reduced heating bills for Government, commercial and domestic users. These will be achieved by both reducing fossil fuel waste in heating systems and by increasing the use of renewable energy, solar energy, to provide hot water. While cost savings in absolute terms will be greatest for the Government and commercial users, cost savings relative to income will be greatest for the poorest households.
- While the project is focused on energy use in heating, it is likely to have knock-on effects on fossil fuel use in cooking and in electricity use in lighting and appliances. This could occur through two routes:
  - Improved co-ordination of energy policy between different parts of 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.
  - 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 high (A or B) energy ratings.
- Secondary socio-economic benefits will accrue from the increased knowledge and capabilities of manufacturers and other actors in the supply chain: developers, installers, maintenance engineers etc. This will make them more competitive and could increase their share of export markets.

Project Rationale and GEF Policy Conformity

71. This project is consistent with GEF-5 Focal Strategy of “Climate Change Mitigation”. The second objective of this focal area strategy is "to promote market transformation for energy efficiency in industry and the building sector". Expected key results and targets under the replenishment target of this focal area strategy, pertaining to the second objective are:

    - 500m tons of CO2e avoided
    - Demonstration of 3-4 innovative technologies in 10-15 countries
    - 0.5 Gigawatt of new renewable energy capacity installed.

72. The project will contribute to these overall goals by direct GHG emission reductions of approximately 1.0 Mton CO2 over the lifetime of the investments. Indirect GHG emission reductions of up to 233 Mton CO2 over the project impact period (2020-2029) relative to the no policy, of which approx. 153 Mton CO2 are incremental savings (relative to the base case).

73. The project is focused on effecting long-term, sustainable change. The focus on market transformation is deliberate, and in line with GEF strategic objectives and priorities for its work on climate change. The foundations of the project lie in addressing legislative, policy and regulatory frameworks and demonstrating the energy savings available through the implementation of cost-effective measures in a sample of existing building stock. These components will support and sustain the market transformation strategies which will focus on capacity building and engaging and harnessing Iran’s commitment to energy efficiency.

74. The project is in line with Strategic Objective 1: Promoting energy efficiency in residential and commercial buildings, with expected direct outcomes such as: Increased market penetration of energy-efficient technologies, practices, products, and materials in the residential and commercial building markets

Country Ownership: Country eligibility and country drivenness

75. According to the Instrument for the Establishment of the Restructured Global Environment Facility, Iran qualifies for GEF financing on the following grounds:

    - It has ratified the United Nations Framework Convention on Climate Change joining the Kyoto protocol in 1995; and
    - It receives development assistance from UNDP's core resources.

76. This project is fully consistent with Iran's national priorities, as outlined in its Constitution, Environmental Protection and Improvement Act, and Common Country Assessment (CCA). One of the goals put forward in the CCA is to increase energy efficiency and reduce air pollution. Article 50 of Iran's Constitution, adopted in December 1979, calls for the preservation of the environment to ensure that the needs of future generations are met. Iran's Fourth 5YDP obligates energy audits in governmental buildings and mandates the rationalization of energy consumption through: a) preparation of standards and technical specifications in relation to energy consumption by appliances, processes and energy-consuming systems so that all consumers, producers and importers of such appliances, processes and systems are mandated to comply with such standards; and b) regulations in relation to energy efficiency standards pertaining to the design and construction of new private sector- and government-owned buildings in order to avert energy waste as well as the design and implementation of reward systems in relation to the existing stock in the use of EE standards. The project has the capacity to reduce energy bills for consumers at a time when energy prices are rapidly increasing due to the reduction of fuel subsidies, thus assisting with poverty reduction.

77. The project complies with the United Nations Development Assistance Framework (UNDAF) (2012-2016) as well as the UNDP Country Program (2012-2016) in the Islamic Republic of Iran under Outcome 4 on Environment.

Sustainability (including financial sustainability)

78. Improving the energy efficiency of buildings in general and heating systems in particular, is generally cost effective. Amongst the different approaches to reducing GHG gases, EE measures are generally the most cost effective. The considerable energy subsidies which were in effect in Iran up to the end of 2010 have distorted the energy market and mean that financial value of energy efficiency has not been obvious to consumers. Now that the subsidies are being reduced, the full benefits of increasing heating efficiency are starting to become apparent.

79. Considering the different energy efficiency aspects of the project separately:
    - Improving the heating systems efficiency requirements in the building code will be very cost effective. Including efficient heating systems in the design of new buildings and installing efficient equipment at the point of construction is the most cost effective approach.
    - Introducing robust product regulations, both minimum energy performance standards (MEPS) and energy labels have consistently been shown to be cost effective. A market with products being highly energy efficient (though MEPS) and/or energy labels enables consumers to have good access to credible information on energy use, and will also increase the effectiveness of the building code.
    - Retrofitting more energy efficient heating systems in existing buildings. The preliminary research undertaken in preparing this proposal suggests that a wide range of low cost

measures are applicable. This is consistent with the high average energy usage of dwellings in Iran at present[6], which suggests considerable scope for energy savings.

80. Another aspect of the project is the installation of solar water heaters (SWH). These are very cost effective in countries with high levels of solar irradiation such as Iran. As for efficiency measures the financial benefits have been obscured by the artificially low (subsidized) energy prices. Installation costs, as well as energy bills, are likely to be reduced when SWHs are installed at the same time that heating systems are being retrofitted, thus making them even more cost effective.

81. Very little of the existing housing stock has efficient heating and water heating or SWHs so there is an enormous potential market. This could increase cost-effectiveness further by offering economies of scale in the equipment costs.

82. More broadly and over and above financial considerations, the aim of the project is to be truly sustainable, transforming both the regulatory and policy frameworks for energy efficiency and the market to deliver it. The project includes design and development of training programmes for every stakeholder in the supply chain: from manufacturers to designers, architects and installers. Ultimately, the project should kick-start a process which, when complete, will enable Iran to undertake every aspect of achieving an efficient heating stock in buildings without assistance from international bodies or companies.

Replicability

83. The energy use per household based on national statistics, (reinforced by the research undertaken in preparing this proposal) indicates that virtually the whole of the existing housing stock of Iran could benefit from a significant reduction in energy use through improvement of the heating systems. These may not necessarily include complete retrofit of heating systems and could be confined to changes in components - e.g. changes to the heating stack or fitting thermostatic valves on radiators can have a significant effect. Thus, if one is to ambitious, the replication potential of this project extends to the current housing stock of around 19 million dwellings.

84. If the project achieves its aim of transforming the heating market then the demand for new, more energy efficient heating systems and heating system components will be stimulated, with the potential for millions of installations. So new regulations (MEPS or labels) on the performance of these products will affect millions of products. Also, the potential changes in building code should affect the majority[7] of new dwellings built once it is introduced and thus will be replicated across new constructions nationwide (depending on the construction rate post introduction).

85. Penetration of SWHs is thought to be very low and the number of dwellings which would be suitable for cost effectively being fitted with SWHs is very high. The potential for replication is thus extensive – probably a high proportion of dwellings – certainly in the millions.

86. The project will address the regulatory and policy framework and the supply chain from manufacturers to building designers/architects to engineers to build the capacity in Iran to meet this potential. It will also include public awareness campaigns and explore the potential for financial incentives for households, thereby increasing the demand from consumers.

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[6] when compared with other countries in a similar climate

[7] depending on the level of compliance

87. The results of the project, if successful, are expected to provide some useful experiences and models for replication internationally.

3. PROJECT RESULTS FRAMEWORK:

This project will contribute to achieving the following Country Programme Outcome as defined in CPAP or CPD: 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
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.

Country Programme Outcome Indicators: 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;

Primary applicable Key Environment and Sustainable Development Key Result Area (same as that on the cover page, circle one): 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.

Applicable GEF Strategic Objective and Program:
CCM-2, Energy Efficiency

Applicable GEF Expected Outcomes:
Outcome 2.1: Appropriate policy, legal and regulatory frameworks adopted and enforced
Outcome 2.2: Sustainable financing and delivery mechanisms established and operational

Applicable GEF Outcome Indicators:
Indicator 2.1: Extent to which EE policies and regulations are adopted and enforced (score of 1 to 5)
Indicator 2.2: Volume of investment mobilized

Project Components	Indicator	Baseline	Target	Means of verification	Assumptions
Project Goal: Reduction of GHG emissions due to improved energy EE in the building sector in Iran	Cumulative CO_2 emission reductions by 2029 from new buildings to be built during project lifetime (2016-2020) against baseline	none	153 Mton CO_2	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
Project Objective: GHG mitigation from the buildings sector in Iran through legislative, policy and regulatory reforms	Average thermal energy consumption for space and water heating in pilot buildings by end of project (residential & non-residential)	Around 277 kWh/year.m^2 on average	Around 166 kWh/year.m^2 on average	Quantitative assessment of thermal performance of buildings through selected audits by independent project evaluation teams.	Government will continue construction at planned rates

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 new and existing buildings in Iran by 2029 (residential & non-residential)		Around 208 kWh/year.m^2 on average	Calculations based on the quantitative measurements of energy use in space and water heating and fuel mix, based on standard best practice.	
Component 1: 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.m^2	Heating system energy requirements adopted by end of project Average energy demand around 110 kWh/year.m^2 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
Output 1.1: 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	
Output 1.2: Revisited regulatory frameworks, in particular a thermal building code that addresses heating	Building energy codes for thermal performances for buildings updated with heating system energy performance requirements.	Heating system performance requirements not included in building energy code	Heating system performance requirements included in building energy code by end of 3rd year of project	Project documentation National regulations Independent evaluation	

system efficiency and standards and labels for heating products	Test standards and energy performance requirements developed and implemented for cooking, heating and water heating products	No test standards	Three test standards and requirements developed and implemented by end of project		
Output 1.3: 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
Output 1.4: 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, and 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 2nd 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

Component 2: Pilot Installations of EE and RE measures in existing building stock	EE and SWH pilots implemented CO_2 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 CO_2 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	
Output 2.1: Implementation of cost-effective energy saving options in privately owned buildings to retrofit the heating system (330) and insulate select thermal bridges (double paned windows – 100)	Heating system retrofits installed Double paned windows installed	Installation of 22,000m^2 of double pane windows in 100 government buildings. Retrofitting of boiler rooms in 39 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 22,000m^2 of double pane windows in 100 government buildings. Double paned windows installed in 100 privately owned buildings by end of 2nd year of project	Project documentation Independent evaluation Site visits	Suitable pilot buildings can be identified
Output 2.2: 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	Project documentation SWH sales & installation data Independent evaluation Site visits	Suitable pilot buildings can be identified Reliable sales & installation data is available

			installed in privately owned buildings by end of 3rd year of project		
Output 2.3: 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
Output 2.4: 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 Post training surveys	Willing stakeholder participation
Component 3: 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 in 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		
Output 3.1: 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

Output 3.2: Capacity development of building professionals in implementation of heating system requirements in a revised thermal building code and product standards, including 1,000 developers, heating system engineers, architects, builders etc.	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
Output 3.3: 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
Output 3.4: Mandatory (e-learning) courses for different stakeholders in the building value chain on the revised thermal code, delivered by professional associations, technical schools and	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	Project documentation Training materials Post training surveys	Willingness of stakeholders to work together

Ministry of Labour courses and the setting-up of an examination and an accreditation body			across various parts of the building supply chain by end of project		
Output 3.5: 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
Output 3.6: 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

TOTAL BUDGET AND WORK PLAN

Award ID:	*00063735*	Project ID(s):	*00080660*
Award Title:	Policy Reforms and Market Transformation of the Energy Efficient Buildings Sector in the I.R. Iran		
Business Unit:	*IRN10*		
Project Title:	Policy Reforms and Market Transformation of the Energy Efficient Buildings Sector in the I.R. Iran		
PIMS no.	*4018*		
Implementing Partner (Executing Agency)	Office of the Vice President's Deputy for Science and Technology (VPDST)		

GEF Outcome/Atlas Activity	Responsible Party/ Implementing Agent	Fund ID	Donor Name	Atlas Budgetary Account Code	ATLAS Budget Description	Amount Year 1 (USD)	Amount Year 2 (USD)	Amount Year 3 (USD)	Amount Year 4 (USD)	Total (USD)	See Budget Note:
OUTCOME 1: Legislative, policy and regulatory frameworks	**PDST/ MoRUD**	**62000**	**GEF**	71200	International Consultants	$65,000	$45,000	$32,000	$0	$142,000	1
				71300	Local Consultants	$10,000	$10,000	$10,000	$10,000	$40,000	2
				71400	Contractual services (ind)	$40,000	$40,000	$10,000	$22,000	$112,000	3
				71600	Travel	$10,000	$8,000	$8,000	$6,000	$32,000	4
				72200	Equipment	$250,000	$250,000	$0	$0	$500,000	5
				74200	Printing and publication cost	$1,000	$1,000	$1,000	$1,000	**$4,000**	6
				74500	Miscellaneous	$5,000	$5,000	$5,000	$5,000	**$20,000**	7
					Subtotal Outcome 1	**$381,000**	**$359,000**	**$66,000**	**$44,000**	**$850,000**	
OUTCOME 2: Implementation of the Pilot for the existing building stock	**PDST/ MoRUD**	**62000**	**GEF**	71200	International Consultants	$40,000	$20,000	$20,000	$0	**$80,000**	8
				71300	Local Consultants	$15,000	$5,000	$15,000	$15,000	**$50,000**	9
				71400	Contractual services (ind)	$45,000	$100,000	$100,000	$75,000	**$320,000**	10
				71600	Travel	$8,000	$3,000	$4,000	$0	**$15,000**	11
				72100	Contractual services (companies)	$45,000	$100,000	$100,000	$75,000	**$320,000**	12

				72200	Equipment	$250,000	$500,000	$250,000	$0	**$1,000,000**	13
				74200	Printing and publication cost	$0	$10,000	$0	$150,000	**$160,000**	14
				74500	Miscellaneous	$15,000	$20,000	$20,000	$0	**$55,000**	15
					Subtotal Outcome 2	**$418,000**	**$758,000**	**$509,000**	**$315,000**	**$2,000,000**	
OUTCOME 3: Implementation of market transformation strategies	**PDST/ MoRUD**	**62000**	**GEF**	71200	International Consultants	$20,000	$20,000	$20,000	$10,000	**$70,000**	16
				71300	Local Consultants	$20,000	$20,000	$20,000	$20,000	**$80,000**	17
				71400	Contractual services (ind)	$65,000	$125,000	$100,000	$54,000	**$344,000**	18
				71600	Travel	$8,000	$7,500	$7,500	$8,000	**$31,000**	19
				72100	Contractual services (companies)	$24,000	$84,000	$75,000	$25,000	**$208,000**	20
				74200	Printing and publication cost	$5,000	$15,000	$15,000	$8,000	**$43,000**	21
				74500	Miscellaneous	$18,000	$22,000	$22,000	$12,000	**$74,000**	22
					Subtotal Outcome 3	**$160,000**	**$293,500**	**$259,500**	**$137,000**	**$850,000**	
OUTCOME 4: Monitoring, Learning, Adaptive Feedback and Evaluation	**UNDP**	**62000**	**GEF**	71200	International Consultants	$0	$0	$30,000	$40,000	**$70,000**	23
				71300	Local Consultants	$4,000	$10,000	$10,000	$11,000	**$35,000**	24
					Subtotal M&E	**$4,000**	**$10,000**	**$40,000**	**$51,000**	**$105,000**	
PROJECT MANAGEMENT UNIT (This is not to appear as an Outcome in the Results Framework and should	**UNDP/PDST/ MoRUD**	**62000**	**GEF**	71200	International Consultants	$32,250	$32,250	$32,250	$32,250	**$129,000**	25
				71300	Local Consultants	$7,750	$7,750	$7,750	$7,750	**$31,000**	26
				71600	Travel	$8,750	$8,750	$8,750	$8,750	**$35,000**	27
					Subtotal GEF	**$48,750**	**$48,750**	**$48,750**	**$48,750**	**$195,000**	
		n/a	**UNDP**	71200	International Consultants	$0	$0	$0	$0	$0	
				71300	Local Consultants	$35,000	$30,000	$30,000	$30,000	$125,000	28

not exceed 10% of project budget)					**Subtotal UNDP**	**$35,000**	**$30,000**	**$30,000**	**$30,000**	**$125,000**	
					Total Management	**$83,750**	**$83,750**	**$83,750**	**$83,750**	**$320,000**	
					PROJECT TOTAL	**$1,046,750**	**$1,499,250**	**$953,250**	**$625,750**	**$4,125,000**	

Summary of Funds:

	Amount Year 1	Amount Year 2	Amount Year 3	Amount Year 4	Total
GEF	$1,011,750	$1,469,250	$923,250	$595,750	$4,000,000
PDST(Government)	$4,056,750	$13,405,750	$8,997,510	$1,931,750	$28,391,760
UNDP (TRAC)	$35,000	$30,000	$30,000	$30,000	$125,000
TOTAL	**$5,103,500**	**$14,905,000**	**$9,950,760**	**$2,557,500**	**$32,516,760**

Budget Notes

General:

- International consultants (ICs) are budgeted at USD 3,000 per week, senior national consultants are budgeted at USD 600 per week and junior national consultants are budgeted at USD 300 per week.
- The cost of organizing workshops (rental of space, organization, food and DSA, presentation materials, etc.) is estimated at USD 1,500 per day (with 20 participants on average).

Specific:

1. 47 person-weeks of international expertise
2. 80 person-weeks of national expertise
3. Subcontracts to support the development of a national cross-sectoral energy efficiency strategy and for the organization of national workshops
4. Travel cost (DSA and ticket) is budgeted at 30% of international consultant's fee and 15% of national consultant's fee as a general rule-of thumb
5. Testing laboratories for boilers and burners and solar water heaters
6. Printing and publication costs for reports, studies and workshop proceedings
7. Miscellaneous for unforeseen expenses
8. 27 person-weeks of international expertise to advise on the implementation of the pilots
9. 75 person-weeks of national expertise
10. Subcontracts to individuals support the building retrofits
11. Travel cost (DSA and ticket) is budgeted at 30% of international consultant's fee and 15% of national consultant's fee as a general rule-of thumb
12. Subcontracts to companies to support the building retrofits
13. Energy efficient equipment such as insulation, turbolators, intelligent controllers, double-pane windows, SWHs. Total costs including co-funding is $8,941.760. This is estimated as (NB all for commercial building or multiple occupancy residential building): 330 boiling room retrofits estimated as an average of $4672 each; 100 double paned window building retrofits at an average $40,000 each and 85 SWH retrofits at an average $40,000 each.
14. Printing and publication costs for evaluations of pilots and other reports
15. Miscellaneous for unforeseen expenses
16. 23 person-weeks of international expertise to support market transformation activities
17. 133 person-weeks of national expertise
18. Contractual services for individuals for training of building professionals, boiler room engineers and manufacturers of boiler rooms
19. Travel cost (DSA and ticket) is budgeted at 30% of international consultant's fee and 15% of national consultant's fee as a general rule-of thumb
20. Contractual services for companies for training of key stakeholders
21. Printing and publication costs for training materials and awareness campaign materials
22. Miscellaneous for unforeseen expenses
23. 23 person-weeks of international expertise for monitoring and evaluation activities
24. 58 person-weeks of national expertise for monitoring and evaluation activities
25. 43 person-weeks of international expertise for project management
26. 52 person-weeks of national expertise for project management
27. Travel cost (DSA and ticket) is budgeted at 30% of international consultant's fee and 15% of national consultant's fee as a general rule-of thumb
28. 250 person-weeks of national expertise for project management

4. MANAGEMENT ARRANGEMENTS

88. The following chapter is summarizing the project management arrangements. For further details about the role, key duties and responsibilities of the different entities and persons engaged in project management, see Annex C: Terms of Reference for Key Personnel.

89. The program will be implemented by the Government of I.R. Iran (i.e. under National Implementation -NIM) in collaboration with UNDP, under the UNDP agreement with the Government of the IR Iran. Experience has shown that NIM modality provides the best balance of successful project implementation, where ensure national ownership is ensured and government priorities addressed.

90. The Office of the President's Deputy for Science and Technology (PDST/CEEE) will serve as the overall Implementing Agency for the UNDP/GEF Full-Scale project with secondary partners such as Ministry of Roads and Urban Development's BHRC and appropriate sub-sets of MoP. PDST will be responsible for the day-to-day operations of the Full-Scale Project

91. The PDST will appoint a National Project Director (NPD) and set-up and staff a project office including technical and administrative support staff. The NPD will be a senior staff member of the PDST and responsible for overseeing the project on behalf of the Government of Iran. A full-time National Project Manager (NPM) will also be appointed by PDST in consultation with UNDP. The NPM will report to the NPD, UNDP and the Project Steering Committee.

92. A Project Steering Committee (PSC) for steering the implementation of the project will be set up and will comprise of representatives from:

- Ministry of Foreign Affairs (MFA);
- UNDP;
- Management and Planning Organisation (MPO);
- Ministry of Roads and Urban Development (MoRUD) through the Building the Housing Research Center (BHRC);
- Department of Environment (DoE);
- Ministry of Cooperative, Labour and Social Welfare;
- Tehran Municipality;
- Iran National Standard Organisation (INSO);
- Engineering Association (i.e. Nezam Mohandesi)
- Ministry of Petroleum (MoP) through its Deputy for Planning and Iran Fuel Conservation Organisation (IFCO); and
- Private sector, financial community, academia, NGOs on an *ad hoc* basis;

The PSC is the highest policy-level meeting which will convene twice per year (i.e. in July upon finalisation of the PIR and December) comprised of the parties directly involved in the implementation of the project. The PSC will supervise, advise and co-ordinate the implementation of the project. The Project Steering Committee (PSC) will be chaired by the National Project Director. Other members can be invited through the decision of the PSC on an as needed basis, to ensure that the PSC is not too enlarged such that its expeditious decision-making is compromised. The final list of the PSC members will be completed at the outset of project operations and presented in the Inception Report. The NPM will participate as a non-voting member in the PSC meetings. To effectively support the project, the PSC should meet at least twice a year.

For the day-to-day operation of the program, a full-time National Project Manager (NPM) will assume operational management of the project. The NPM will be accountable to the Implementing Agency and UNDP for the planning, management, quality, timeliness and effectiveness of the activities carried out and the use of the funds. As a part of that, the NPM will closely monitor the activities under implementation and ensure that they will be closely co-ordinated with the other on-going and planned activities in Iran.

93. The project team will be established and recruited on a competitive basis. The project team will be managed by the NPM with support from UNDP if requested. The NPM will, during the first two years of project implementation, be supported by a part time international chief technical adviser (CTA) as well as by local support staff in the overall project management, including logistical support, circulation of discussion papers and draft reports, raising public awareness on project activities, accountancy support, coordinating and monitoring the work of the consultants and providing other support needed.

94. The three project components will be staffed by part-time teams of local experts and international experts, working closely together. Component 1 (Legislative, Policy and Regulatory Frameworks) will be driven by experts and consultants with experience in policy, building codes, heating products and GHG monitoring. Together they will research international best practices, propose changes in current legislation, develop proposals for enforcement strategies and mechanisms for compliance and develop methodologies for measuring building and heating system performance. This team will advise on the design and delivery of Component 2 (Installation of EE measures), which will be managed by a Pilot Project Coordinator.

95. The team working on Component 3 (Implementing Marketing Transformation Strategies) will comprise of experts and consultants with experience in capacity building, finance, training and communications. The Capacity Building team will work with experts and consultants with expertise in building codes and heating products to analysis the baseline situation and design a capacity building plan focused on manufacturers and supply chain stakeholders; they will also provide input into Component 2 (Output 2.4). The financial expert and consultant will examine international best practices and develop the analyses for the implementation of household financial incentive schemes and coordinate capacity building activities for financial institutions. Together the Communications expert and consultant will identify stakeholder groups and key partners, and design and co-ordinate a communication and awareness strategy and accompanying campaign. They will also be responsible for coordinating surveys to assess the impact of the consumer campaign and the training programs.

96. Representatives of universities and other research/educational institutions as well as the NGOs and private sector are foreseen to be actively involved in the implementation of project activities, especially in activities related to public awareness raising, education and training activities, research related to the technical aspects of the technologies to be promoted as well as monitoring and evaluation of the overall results of the project.

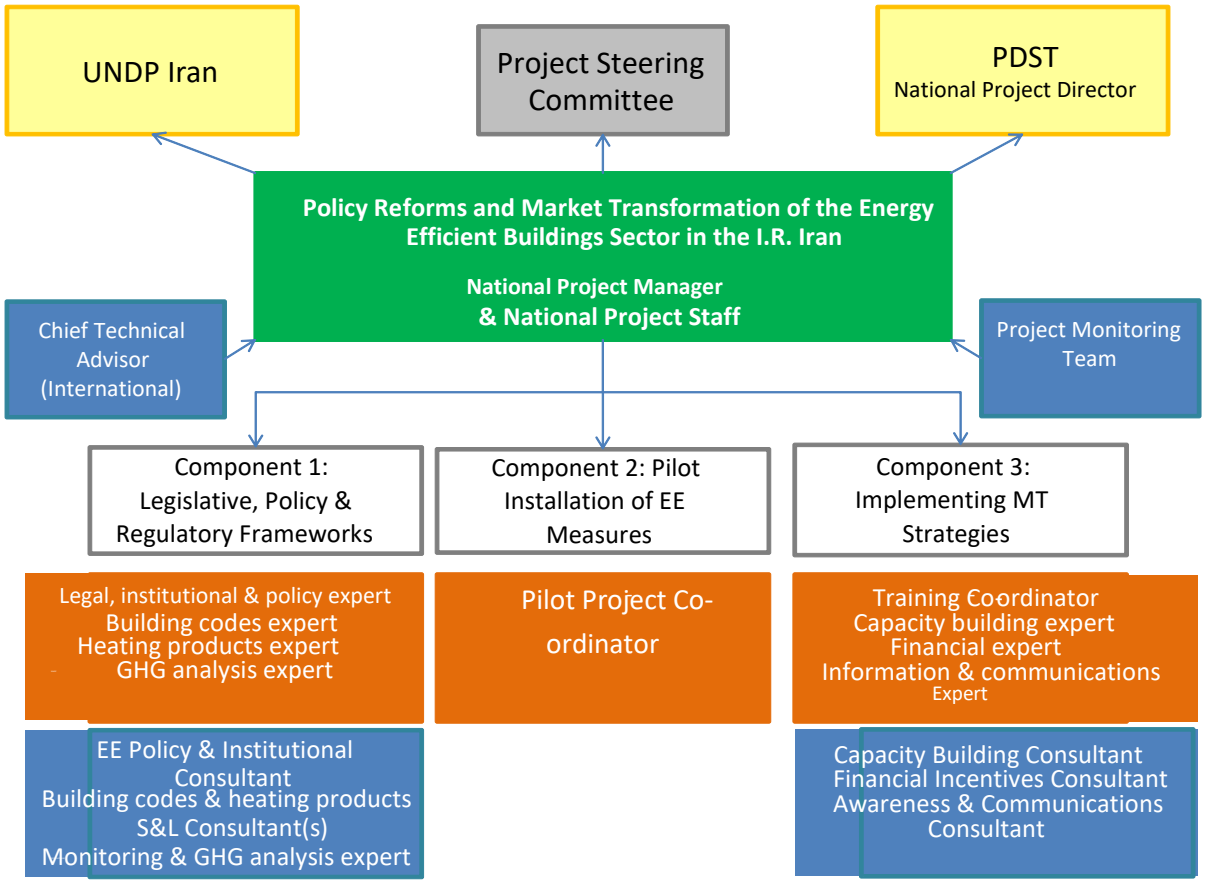
97. In order to accord proper acknowledgement to GEF for providing funding, a GEF logo should appear on all relevant GEF project publications, including any hardware purchased with GEF funds. Any citation on publications regarding projects funded by GEF should also accord proper acknowledgement to GEF. The UNDP logo should be separated from GEF logo, if possible.

98. At mid and final stages of project implementation an independent Project Evaluation Team will established to conduct project evaluations, made up of an international team

leader and national consultant. A monitoring team will also be established to monitor project progress on an on-going basis.

99. Full details of staffing can be found in Annex C. For an overview see the Project Organizational Chart below.

Project Organizational Chart



5. MONITORING FRAMEWORK AND EVALUATION

100. Project monitoring and evaluation will be conducted in accordance with established UNDP and GEF procedures. The Logical Framework Matrix in Section 2 provides performance and impact indicators for project implementation along with their corresponding means of verification. These will form the basis, on which the project's Monitoring and Evaluation Plan will be built.

101. The following sections outline the principle components of the Monitoring and Evaluation Plan and indicative cost estimates related to M&E activities. The project's Monitoring and Evaluation Plan will be presented and finalized at the Project's Inception Report following a collective fine-tuning of indicators, means of verification, and the full definition of project staff's M&E responsibilities.

6. PROJECT INCEPTION

102. A Project Inception Workshop will be conducted with the full project team, relevant government counterparts, co-financing partners, the UNDP CO and representation from the UNDP-GEF Regional Coordinating Unit.

103. A fundamental objective of this Inception Workshop (IW) will be to assist the project team to understand and take ownership of the project's goals and objectives, as well as finalize preparation of the project's first annual work plan on the basis of the project's log frame matrix. This will include reviewing the log frame (activities, indicators, means of verification, assumptions), imparting additional detail as needed, and on the basis of this exercise thus finalizing the Annual Work Plan (AWP) with precise and measurable performance indicators, and in a manner consistent with the expected outcomes of the project.

104. Additionally, the purpose and objective of the (IW will be to: (i) introduce project staff with the UNDP-GEF expanded team which will support the project during its implementation, namely the CO and responsible Regional Coordinating Unit staff; (ii) detail the roles, support services and complementary responsibilities of UNDP-CO and RCU staff vis-a-vis the project team; (iii) provide a detailed overview of UNDP-GEF reporting and monitoring and evaluation (M&E) requirements, with particular emphasis on the Annual Project Implementation Reviews (PIRs) and related documentation, the Annual Project Progress Report (APPR), Tripartite Review Meetings, as well as mid-term and final evaluations. Equally, the IW will provide an opportunity to inform the project team on UNDP project related budgetary planning, budget reviews, and mandatory budget re-phasing.

105. The IW will also provide an opportunity for all parties to understand their roles, functions, and responsibilities within the project's decision-making structures, including reporting and communication lines, and conflict resolution mechanisms. The Terms of Reference for project staff and decision-making structures will be discussed again, as needed, in order to clarify each party's responsibilities during the project's implementation phase.

106. An Inception Report is a key reference document and must be prepared and shared with participants to formalize various agreements and plans decided during the meeting.

7. MONITORING RESPONSIBILITIES AND EVENTS

107. A detailed schedule of project review meetings will be developed by the project management, in consultation with project implementation partners and stakeholder

representatives, and incorporated in the Inception Report. Such a schedule will include: (i) tentative time frames for Tripartite Reviews, Steering Committee Meetings, (or relevant advisory and/or coordination mechanisms) and (ii) project related Monitoring and Evaluation activities.

Day to Day:

- *Day to day monitoring of implementation progress will be the responsibility of the NPM, with CTA's support based on the project's Annual Work Plan and its indicators. The Project Team will inform the UNDP CO of any delays or difficulties faced during implementation so that the appropriate support or corrective measures can be adopted in a timely and remedial fashion.*
- *The project management team will fine-tune the progress and performance/impact indicators of the project in consultation with the full project team at the Inception Workshop with support from UNDP CO and assisted by the UNDP-GEF Regional Coordinating Unit. Specific targets for the first year implementation progress indicators together with their means of verification will be developed at this Workshop. These will be used to assess whether implementation is proceeding at the intended pace and in the right direction and will form part of the Annual Work Plan. The local implementing agencies will also take part in the Inception Workshop, in which a common vision of overall project goals will be established. Targets and indicators for subsequent years would be defined annually as a part of the internal evaluation and planning processes undertaken by the project team.*
- *Measurement of impact indicators related to global benefits will occur according to the schedules defined in the Inception Workshop. The measurement of these will be facilitated by subcontracts or retainers with relevant institutions or through specific studies that are to form part of the projects activities (e.g. measurement of carbon benefits or through surveys for capacity building efforts).*

Periodic:

- *Periodic monitoring of implementation progress will be undertaken by the UNDP-CO through periodic meetings with the project proponent as deemed necessary. This will allow parties to take stock and to troubleshoot any problems pertaining to the project in a timely fashion to ensure smooth implementation of project activities.*
- *UNDP Country Offices and UNDP-GEF RCUs, as appropriate, will conduct yearly visits to projects that have field sites, or more often based on an agreed upon scheduled to be detailed in the project's Inception Report / Annual Work Plan to assess project progress. Any other member of the Steering Committee can also accompany, as decided by the PSC. A Field Visit Report will be prepared by the CO and circulated no less than one month after the visit to the project team, all PSC members, and UNDP-GEF.*
- *Progress made shall be monitored in the UNDP Enhanced Results Based Management Platform.*
- *Based on the initial risk analysis submitted, the risk log shall be regularly updated in ATLAS. Risks become critical when the impact and probability are high.*

Bi-annually:

- *Bi-annual high-level monitoring will be carried out by the PSC in July of each year once the PIR is finalised and in December upon finalisation of the APPR. The PSC is the highest policy-level meeting which will convene twice per year (i.e. in July and December) comprised of the parties directly involved in the implementation of the project. The project proponent will prepare an Annual Project Progress Report in December (APPR) and a /Project Implementation Review (PIR) in July. These will and submit it to UNDP CO and the UNDP-GEF regional office at least two weeks prior to the year-end PSC meeting for review and comments.*

- *The APPR/PIR will be used as one of the basic documents for discussions in the PSC meetings. The project proponent will present the APPR/PIR to the PSC, highlighting policy issues and recommendations for the decision of the PSC participants. The project proponent also informs the participants of any agreement reached during the APPR/PIR preparation on how to resolve operational issues. Separate reviews of each project component may also be conducted if necessary.*

Periodic Monitoring through site visits:

108. UNDP CO and the UNDP RCU will conduct visits to project sites based on the agreed schedule in the project's Inception Report/Annual Work Plan to assess first hand project progress. Other members of the Project Board may also join these visits. A Field Visit Report/BTOR will be prepared by the CO and UNDP RCU and will be circulated no less than one month after the visit to the project team and Project Steering Committee members.

Mid-term of project cycle:

109. The project will undergo an independent Mid-Term Evaluation at the mid-point of project implementation (2 years after the start of the project). The Mid-Term Evaluation will determine progress being made toward the achievement of outcomes and will identify course correction if needed. It will focus on the effectiveness, efficiency and timeliness of project implementation; will highlight issues requiring decisions and actions; and will present initial lessons learned about project design, implementation and management. Findings of this review will be incorporated as recommendations for enhanced implementation during the final half of the project's term. The organization, terms of reference and timing of the mid-term evaluation will be decided after consultation between the parties to the project document. The Terms of Reference for this Mid-term evaluation will be prepared by the UNDP CO based on guidance from the Regional Coordinating Unit and UNDP-GEF. The management response and the evaluation will be uploaded to UNDP corporate systems, in particular the UNDP Evaluation Office Evaluation Resource Center (ERC). The relevant GEF Focal Area Tracking Tools will also be completed during the mid-term evaluation cycle.

8. END OF PROJECT:

110. The Terminal Tripartite Review (TTR) is held in the last month of project operations and following the conclusion of the independent final project evaluation. The project proponent is responsible for preparing the Terminal Report (taking into account the findings of the final evaluation) and submitting it to UNDP CO and RBAP's Regional Coordinating Unit. It shall be prepared in draft at least two months in advance of the TTR in order to allow review, and will serve as the basis for discussions in the TTR. The terminal tripartite review considers the implementation of the project as a whole, paying particular attention to whether the project has achieved its stated objectives and contributed to the broader environmental objective. It decides whether any actions are still necessary, particularly in relation to sustainability of project results, and acts as a vehicle through which lessons learnt can be captured to feed into other projects under implementation or formulation.

111. Based on the recommendations of the PSC, the NPD has the authority to suspend disbursement if project performance benchmarks are not met. Benchmarks will be developed at the Inception Workshop, based on the performance and impact indicators defined in the projects logical framework matrix.

9. PROJECT MONITORING REPORTING

112. The NPM, in conjunction with the UNDP-GEF extended team, will be responsible for the preparation and submission of the following reports that form part of the monitoring process. Items (a) through (f) are mandatory and strictly related to monitoring, while (g) through (h) have a broader function and the frequency and nature is project specific to be defined throughout implementation.

Inception Report (IR)

113. A Project Inception Report will be prepared immediately following the Inception Workshop. It will include a detailed First Year Annual Work Plan divided in bi-annual time-frames detailing the activities and progress indicators that will guide implementation during the first year of the project as well as a multi-year work plan for the period to December 2020. Separately a Monitoring Plan would include the dates of specific field visits, support missions from the UNDP-CO or the Regional Coordinating Unit (RCU) or consultants, as well as time-frames for meetings of the project's decision making structures. The Report will also include a detailed project budget for the first full year of implementation, prepared on the basis of the Annual Work Plan, and including any monitoring and evaluation requirements to effectively measure project performance during the targeted 12 month time-frame.

114. The Inception Report will include a more detailed narrative on the institutional roles, responsibilities, coordinating actions and feedback mechanisms of project related partners. In addition, a section will be included on progress to date on project establishment and start-up activities and an update of any changed external conditions that may affect project implementation.

115. After finalization, the report will be circulated to the project counterparts who will be given a period of one calendar month in which to respond with comments or queries. Prior to this circulation of the IR, the UNDP Country Office and UNDP-GEF's Regional Coordinating Unit will review the document.

Annual Project Progress Report (APPR)

116. The APPR is a UNDP requirement and part of UNDP's CO central oversight, monitoring and project management. It is a self -assessment report by project management to the CO and provides input to the CO reporting process and the ROAR, as well as forming a key input to the PSC Review. An APPR will be prepared on an annual basis prior to the PSC Review, to reflect progress achieved in meeting the project's Annual Work Plan and assess performance of the project in contributing to intended outcomes through outputs and partnership work.

117. The format of the APPR will be provided by UNDP and will include the following:

- An analysis of project performance over the reporting period, including outputs produced and, where possible, information on the status of the outcome;
- The constraints experienced in the progress towards results and the reasons for these;
- The three (at most) major constraints to achievement of results;
- AWP, CAE and other expenditure reports (ERP generated);
- Lessons learned;
- Clear recommendations for future orientation in addressing key problems in lack of progress

Project Implementation Review (PIR)

118. The PIR is an annual monitoring process mandated by the GEF. It has become an essential management and monitoring tool for project managers and offers the main vehicle for extracting lessons from on-going projects. Once the project has been under implementation for a year, a PIR must be completed by the CO together with the project team. The PIR is typically prepared immediately after the end of the GEF's financial year (June) and ideally prior to the mid-year PSC meeting. The PIR should then be discussed in the PSC so that the result would be a PIR that has been agreed upon by the project, the Implementing Partner, UNDP CO and the concerned UNDP-GEF RTA.

119. The individual PIRs are collected, reviewed and analysed by the UNDP-GEF RTA prior to sending them to the focal area clusters at the UNDP/GEF headquarters. The focal area clusters supported by the UNDP/GEF M&E Unit analyse the PIRs by focal area, theme and region for common issues/results and lessons. The RTAs and PTAs play a key role in this consolidating analysis.

120. The focal area PIRs are then discussed in the GEF Inter-agency Focal Area Task Forces in or around November each year and consolidated reports by focal area are collated by the GEF Independent M&E Unit based on the Task Force findings.

121. The GEF M&E Unit provides the scope and content of the PIR. In light of the similarities of both APPR and PIR, UNDP/GEF has prepared a harmonized format for reference, which is available from UNDP/GEF's M&E Unit.

Bi-annual Progress Reports

122. Short reports outlining main updates in project progress will be provided bi-annually to the local UNDP CO and the UNDP-GEF regional office by the project team in PAPRP format.

- Based on the information recorded in Atlas, a Project Progress Reports (PPR) can be generated in the Executive Snapshot.
- Other ATLAS logs can be used to monitor issues, lessons learned etc... The use of these functions is a key indicator in the UNDP Executive Balanced Scorecard.

Periodic Thematic Reports

123. As and when called for by UNDP, UNDP-GEF or the Implementing Partner, the project team will prepare Specific Thematic Reports, focusing on specific issues or areas of activity. The request for a Thematic Report will be provided to the project team in written form by UNDP and will clearly state the issue or activities that need to be reported on. These reports can be used as a form of lessons learnt exercise, specific oversight in key areas, or as troubleshooting exercises to evaluate and overcome obstacles and difficulties encountered. UNDP is requested to minimize its requests for Thematic Reports, and when such are necessary will allow reasonable timeframes for their preparation by the project team.

Project Terminal Report

124. During the last three months of the project and after the final independent evaluation, the project team will prepare the Project Terminal Report. This comprehensive report will summarize all activities, achievements and outputs of the project, lessons learnt, objectives met, or not achieved structures and systems implemented, etc. and will be the

definitive statement of the Project's activities during its lifetime. It will also lay out recommendations for any further steps that may need to be taken to ensure sustainability and replicability of the Project's activities.

Technical Reports (project specific- optional)

125. Technical Reports are detailed documents covering specific areas of analysis or scientific specializations within the overall project. As part of the Inception Report, the project team will prepare a draft Reports List, detailing the technical reports that are expected to be prepared on key areas of activity during the course of the Project, and tentative due dates. Where necessary this Reports List will be revised and updated. Technical Reports may also be prepared by external consultants and should be comprehensive, specialized analyses of clearly defined areas of research within the framework of the project and its sites. These technical reports will represent, as appropriate, the project's substantive contribution to specific areas, and will be used in efforts to disseminate relevant information and best practices at local, national and international levels.

Project Publications (project specific- optional)

126. Project Publications will form a key method of crystallizing and disseminating the results and achievements of the Project. These publications may be scientific or informational texts on the activities and achievements of the Project, in the form of journal articles, multimedia publications, etc. These publications can be based on Technical Reports, depending upon the relevance, scientific worth, etc. of these Reports, or may be summaries or compilations of a series of Technical Reports and other research. The project team will determine if any of the Technical Reports merit formal publication, and will also (in consultation with UNDP, the government and other relevant stakeholder groups) plan and produce these Publications in a consistent and recognizable format. Project resources will need to be defined and allocated for these activities as appropriate and in a manner commensurate with the project's budget.

10. INDEPENDENT EVALUATION

127. The project will be subjected to at least two independent external evaluations as follows:

Mid-term Evaluation

128. An independent Mid-Term Evaluation will be undertaken at the end of the second year of implementation. The Mid-Term Evaluation will determine progress being made towards the achievement of outcomes and will identify course correction if needed. It will focus on the effectiveness, efficiency and timeliness of project implementation; will highlight issues requiring decisions and actions; and will present initial lessons learned about project design, implementation and management. Findings of this review will be incorporated as recommendations for enhanced implementation during the final half of the project's term. The organization, Terms of Reference and timing of the mid-term evaluation will be decided after consultation between the parties to the project document. The Terms of Reference for this Mid-term evaluation will be prepared by the UNDP CO based on guidance from the Regional Coordinating Unit and UNDP-GEF.

Final Evaluation

129. An independent Final Evaluation will take place three months prior to the terminal tripartite review meeting, and will focus on the same issues as the mid-term evaluation. The final evaluation will also look at impact and sustainability of results, including the contribution to capacity development and the achievement of global environmental goals. The Final

Evaluation should also provide recommendations for follow-up activities. The Terms of Reference for this evaluation will be prepared by the UNDP CO based on guidance from the Regional Coordinating Unit and UNDP-GEF.

130. The Terminal Evaluation should also provide recommendations for follow-up activities and requires a management response which should be uploaded to PIMS and to the UNDP Evaluation Office Evaluation Resource Center (ERC).

131. The relevant GEF Focal Area Tracking Tools will also be completed during the final evaluation.

Audit Clause

132. The project will be audited according to current UNDP Financial Regulations and Rules and applicable Audit policies.

11. LEARNING AND KNOWLEDGE SHARING:

133. Results from the project will be disseminated within and beyond the project intervention zone through a number of existing information sharing networks and forums. In addition:
    - The project will participate, as relevant and appropriate, in UNDP/GEF sponsored networks, organized for Senior Personnel working on projects that share common characteristics.
    - The project will identify and participate, as relevant and appropriate, in scientific, policy-based and/or any other networks, which may be of benefit to project implementation though lessons learned.
    - The project will identify, analyse, and share lessons learned that might be beneficial in the design and implementation of similar future projects. Identify and analysing lessons learned is an on- going process, and the need to communicate such lessons as one of the project's central contributions is a requirement to be delivered not less frequently than once every 12 months. UNDP/GEF shall provide a format and assist the project team in categorizing, documenting and reporting on lessons learned. To this end a percentage of project resources will need to be allocated for these activities.

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

135. The project will identify and participate, as relevant and appropriate, in scientific, policy-based and/or any other networks, which may be of benefit to project implementation though lessons learned. The project will identify, analyse, and share lessons learned that might be beneficial in the design and implementation of similar future projects.

136. Finally, there will be a two-way flow of information between this project and other projects of a similar focus.

12. COMMUNICATIONS AND VISIBILITY REQUIREMENTS:

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

logo. The GEF logo can be accessed at: http://www.thegef.org/gef/GEF_logo. The UNDP logo can be accessed at http://intra.undp.org/coa/branding.shtml.

138. Full compliance is also required with the GEF's Communication and Visibility Guidelines (the "GEF Guidelines"). The GEF Guidelines can be accessed at: http://www.thegef.org/gef/sites/thegef.org/files/documents/C.40.08_Branding_the_GEF%20final_0.pdf. Amongst other things, the GEF Guidelines describe when and how the GEF logo needs to be used in project publications, vehicles, supplies and other project equipment. The GEF Guidelines also describe other GEF promotional requirements regarding press releases, press conferences, press visits, visits by Government officials, productions and other promotional items.

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

13. M&E WORK PLAN AND BUDGET

Type of M&E activity	Responsible Parties	Budget US$ *Excluding project team Staff time*	Time frame
Inception Workshop	Project Manager UNDP Iran UNDP GEF	5,000	Within first two months of project start up
Inception Report	Project Team UNDP Iran	None	Immediately following IW
Development of a Methodology for Measuring Building and Heating System Performance and Related Emissions Reductions	Oversight by UNDP-GEF Regional Technical Advisor (RTA) Short-term international consultant	12,000	Immediately following IW
Monitoring of average nationwide energy demand in buildings for space and water heating	Project manager Short-term international consultant Short-term national consultants	60,000	Start, mid and end of project
Evaluation of existing building pilot projects energy demand reductions	Oversight by Project RTA and Project Manager Measurements by contractors installing heating system improvements	(included in cost of pilots)	Measurements at start and end of pilot project implementation; annual reporting starting at end of year 2 of project.
Evaluation of solar water heater projects energy demand reductions	Oversight by Project RTA and Project Manager Measurements by contractors installing SWH systems	(included in cost of pilots)	Measurements at start and end of pilot project implementation; annual reporting starting at end of year 2 of project.
Monitoring of amount and quality of training of building professionals and boiler room operators	Project Team National consultant (survey expert)	15,000	At mid and end of project
Monitoring consumer awareness of heating system efficiency issues	Project Team National consultant (survey expert)	30,000	At mid and end of project
APPR and PIR	Project Manager UNDP Iran UNDP-GEF	None	Annually
Steering Committee Meetings	National Project Manager and Director (NPM & NPD) UNDP Iran	None	Following Project IW and subsequently at least once a year
Periodic status reports	Project team	None	To be determined by Project team and UNDP CO
Independent Mid-term Evaluation	Project team UNDP Iran UNDP-GEF RTA External Evaluation Team (consultants)	30,000	At the mid-point of project implementation.

Type of M&E activity	Responsible Parties	**Budget US$** *Excluding project team Staff time*	Time frame
Final External Evaluation	□ Project team, □ UNDP Iran □ UNDP-GEF RTA □ External Evaluation Team (consultants)	40,000	At the end of project implementation
Terminal Report	□ Project team □ UNDP Iran	None	At least one month before the end of the project
Documentation of lessons learned	□ Project team □ UNDP-GEF RTA □ Short-term national consultants	8,000	Bi-annually
Financial audits	□ UNDP Iran □ Project team □ Audit firm	15,000	Annually
TOTAL INDICATIVE COST *Excluding project team staff time and UNDP staff and travel expenses*		215,000	

14. LEGAL CONTEXT

The attached Legal Annex B.III agreed to between the Government of I. R. of Iran and UNDP in August 2010 will serve as the legal context of the project.

15. RISK MANAGEMENT STANDARD CLAUSES

1. Consistent with the Article III of the SBAA *[or the Supplemental Provisions]*, the responsibility for the safety and security of the Implementing Partner and its personnel and property, and of UNDP's property in the Implementing Partner's custody, rests with the Implementing Partner. To this end, the Implementing Partner shall:
   a) put in place an appropriate security plan and maintain the security plan, taking into account the security situation in the country where the project is being carried;
   b) assume all risks and liabilities related to the Implementing Partner's security, and the full implementation of the security plan.

2. UNDP reserves the right to verify whether such a plan is in place, and to suggest modifications to the plan when necessary. Failure to maintain and implement an appropriate security plan as required hereunder shall be deemed a breach of the Implementing Partner's obligations under this Project Document [and the Project Cooperation Agreement between UNDP and the Implementing Partner][8].

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

4. Consistent with UNDP's Programme and Operations Policies and Procedures, social and environmental sustainability will be enhanced through application of the UNDP Social and Environmental Standards (http://www.undp.org/ses) and related Accountability Mechanism (http://www.undp.org/secu-srm).

5. The Implementing Partner shall: (a) conduct project and programme-related activities in a manner consistent with the UNDP Social and Environmental Standards, (b) implement any management or mitigation plan prepared for the project or programme to comply with such standards, and (c) engage in a constructive and timely manner to address any concerns and complaints raised through the Accountability Mechanism. UNDP will seek to ensure that communities and other project stakeholders are informed of and have access to the Accountability Mechanism.

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

[8] Use bracketed text only when IP is an NGO/IGO

16. ANNEXES

ANNEX A: OFFLINE RISK LOG

Project Title: Policy Reforms and Market Transformation on the Energy Efficient Buildings Sector in the I.R. Iran					**Award ID:** PIMS 4018		**Date:** August 2011		
#	**Description**	**Date Identified**	**Type**	**Impact & Probability**	**Countermeasures / Management response**	**Owner**	**Submitted, updated by**	**Last Update**	**Status**
1	Potential lack of public awareness of EE	From project outset	Other	If this risk were to occur it would result in a low household demand for relevant EE products and uptake of retrofitting measures P = 2 I = 3	A focused public awareness campaign and a financial incentives strategy will be put in place to encourage awareness and uptake.	Implementing Agency			
2	Potential lack of inter-sectoral coordination between project key stakeholders including line ministries and private sector	From project outset	Political Regulatory Strategic	If this was to occur it would be difficult for the project to reach the necessary stakeholders and to ensure a coordinated response to the issues raised 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	PSC Implementing Agency All stakeholders			

					Plan that will be developed under the project will include clear institutional roles and coordination mechanisms.				
3	Potential for weak or delayed policy implementation, most notably lack of enforcement of the more stringent energy efficient building codes	From project outset	Political Regulatory	Insubstantial political support will undermine the achievements of the project. 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.	Implementing Agency			
4	Low level of knowledge and skills among local professionals to integrate energy efficiency in building design and operations.	From project outset	Operational	Without support from building professionals such as engineers and architects, it will be difficult to bring into effect sustainable change and market transformation. There is therefore the risk that the achievements of the project would be short-lived if their buy-in was not secured. P = 2	The project will provide technical assistance to build capacities of various local stakeholders involved in building design, construction and operation.	Implementing Agency			

				I = 3					
5	Potential strong negative public reaction to the reduction of fuel price subsidies	From project outset	Political	If this was to occur, it could lead the Government to halt the process of subsidy reduction or even start to increase energy subsidies. (Artificially) lower energy prices would reduce the demand for energy saving measures. 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	Government Implementing Agency			
6	Possible low availability of the energy saving products	From project outset	Strategic	This would mean that the demand generated by the project through greater public awareness, cannot be met. P = 1 I = 1	The project aims to increase the capability of local manufacturers to make higher efficiency products. If local supply cannot satisfy demand in the short term products can be imported.	Implementing Agency			
7	It may not possible to find enough low efficiency Government owned buildings to meet the target of retrofitted systems in the pilot phase.	From project outset	Strategic	This would result in an unsuccessful pilot project. 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 330 privately owned residences.	Implementing Agency			

8	It may not be possible to find energy saving measures for the pilot phase which are cost effective.	From project outset	Strategic	This would result in a less successful pilot project than currently anticipated. P = 1 I = 2	The current situation suggests that there are extensive energy savings from simple, low cost 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.	Implementing Agency			
9	There may be a low level of interest from engineers in receiving training in energy saving installation and maintenance.		Operational Strategic	Without support from building professionals such as engineers and architects, it will be difficult to bring into effect sustainable change and market transformation. There is therefore the risk that the achievements of the project would be short-lived if their buy-in was not secured. 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.	Implementing Agency			

ANNEX B: AGREEMENTS. *Any additional agreements, such as cost sharing agreements, project cooperation agreements signed with NGOs[9] (where the NGO is designated as the "executing entity", letters of financial commitments, GEF OFP letter, GEF PIFs and other templates for all project types) should be attached.*

17. **LETTER OF AGREEMENT BETWEEN UNDP AND GOVERNMENT OF IRAN FOR THE PROVISION OF SUPPORT SERVICES**

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

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

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

    - Identification and/or recruitment of project and programme personnel;
    - Identification and facilitation of training activities;
    - Procurement of goods and services including customs clearance;
    - Travel Management Services;
    - Financial Record Management;
    - ICT Services
    - Logistical support to Event Organizations

4. The provision of support services as per paragraph 3 above by the UNDP country office shall be in accordance with the UNDP regulations, rules, policies and procedures. Support services described in paragraph 3 above shall be detailed in an annex to the programme support document or project document. If the requirements for support services by the country office change during the life of a programme or project, the annex to the programme support document or project document is revised with the mutual agreement of the UNDP resident representative and the designated institution.

5. The relevant provisions of the Legal Annex to Project Documents including the provisions on liability and privileges and immunities, shall apply to the provision of such support services. The Government shall retain overall responsibility for the nationally managed programme or project through its designated institution. The responsibility of the UNDP country office for the provision of the support services described herein shall be limited to the provision of such support services detailed in the annex to the programme support document or project document.

6.

[9] *For GEF projects, the agreement with any NGO pre-selected to be the main contractor should include the rationale for having pre-selected that NGO.*

7. Any claim or dispute arising under or in connection with the provision of support services by the UNDP country office in accordance with this letter shall be handled pursuant to the relevant provisions of the Legal Annex to Project Documents.
8. The manner and method of cost-recovery by the UNDP country office in providing the support services described in paragraph 3 above shall be specified in the annex to the programme support document or project document.

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

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

18. **U**

NDP COST RECOVERY POLICY

Cost recovery refers to the requirement for the organization to recover costs from other resources that are not directly linked to providing the required organizational structures for projects and programmes. The fundamental aim of cost recovery is to achieve a proportional funding of organizational costs between regular and other resources. This demands that UNDP must avoid using regular resources to subsidize activities funded from other resources, including the use of regular resources to cover costs related to the management and support of programme activities funded by other resources.

Within the context of the harmonized methodology for calculating cost-recovery rates on other resources **(EB document DP-FPA/2013/1 and EB Decision 2013/9**) organizational costs between regular and other resources will be more equitably funded, through two main strategies:

1) Increasing the cost recovery rate from the minimum 7% to 8% (effective 1 January 2014), therefore allowing more organizational costs to be funded from the cost recovery income earned on managing the other resources (and less from regular resources);
2) Direct project charging of eligible organizational costs to regular and other resources funded projects and programmes, in particular the development effectiveness category. Direct Project Costs are part of the project budget input and are directly linked to the achievement of development results.

The above are also two types of costs that UNDP distinguishes between in the implementation of its activities:

1) Organizational costs that are directly linked to the project budgets, achievement of development results and arise from the implementation of projects and programmes funded from regular and other resources. These are Direct Project Costs. (Refer to POPP chapter on DPC)
2) Costs that are in addition to direct project costs, and are incurred by an organization as a function and in support of its other resources funded activities, projects and programmes, and cannot be traced unequivocally to specific activities, project or programmes. These are General Management Support (GMS) costs. (Refer to POPP chapter on Cost Recovery from Other Resources – General Management Support (GMS))

The fundamental principle and benefits of the application of the cost recovery methodology contributes to a more equitable sharing of costs of management activities between regular and other resources. By funding qualified development effectiveness activities, where appropriate, directly from regular and other resources programmes and projects (applying the Direct Project Costing Policy and Methodologies), the cost recovery income (extra-budgetary resources) previously used to finance development effectiveness activities shall be used to fund management activities that presently are financed from regular resources. These regular resources will then be re-allocated to finance programme activities - a major benefit of the cost recovery framework.

The cost recovery methodology enables organizational costs to be aligned to appropriate results frameworks and funding streams and UNDP to more sustainably finance the requisite organizational structures and capacities to successfully deliver on programme results. Furthermore, the policy on multi-funding of eligible posts provides the flexibility to align costs

with results frameworks and related funding sources (POPP Multiple Funding Lines for Positions), and assist COs in applying the Direct Project Costing Policy and Methodologies (POPP Direct Project Costs (DPC)).

Critical to the success of the cost recovery methodology will be UNDP's ability to balance the interests of all donors, regular (core) and other resources (non-core) by:

a. continuing to take measures to contain organizational costs through effectiveness and efficiency measures; assuring regular (core) resources donors that they are not carrying a disproportionate share of organizational costs and continuing to make the maximum amount of regular resources available for programmatic activities; and
b. assuring other resources (non-core) donors that the costs being shifted to programmes and projects are justified, and that they are not being charged twice for the same thing (i.e. the cost recovery GMS purpose/utilization does not duplicate the Direct Project Costing purpose/utilization). The GMS fee recovers organizational infrastructure costs while direct project costs are part of the project budget input.

2016 Universal Price List and Local Price List - UNDP Iran

Valid as of 1 March 2016

Services	*UPL/LPL 2016 in USD*
Financial Management/Payment Process	
Payment Process*	**36.1**
Pay cycle/issue cheque only*	**15.23**
Voucher / APJV Approval Only (additional $15.09 if over $30,000)	**4.83**
Pay cycle + Approval of Voucher (additional $15.09 if over $30,000)	**20.06**
Cheque Cancelation	**3.70**
Reissuance of a cheque including cancelation	**39.80**
AR Deposit process*	**33.95**
Issue / Apply Deposit Only*	**20.68**
GLJE Creation and approval	**31.86**
GLJE approval only	**5.85**
AP Journal (APJV)	**22.11**
Approve PO only (additional $22.51 if over $30,000)	**9.36**
Budget Revision	**31.86**
Financial Record Management per voucher	**13.71**
HR Services	
Selection/recruitment process per SC/FT (including Adv.)*	**586.14**
Advertisement (20%)*	117.23
Short-listing (40%)* (*if written exam for up to 5 is needed additional $90.25 will be applicable*)	234.46
Interviewing (40%)*	234.46
Staff HR & Benefits Administration & Management (one time fee, per personnel at the issuance of a contract, and again at separation)*	**198.44**
LP issuance/renewal*	**36.55**
Computer based exam center venue / per 2-hr session	**105.00**
Computer based exam center venue and admin support per 2-hr session	**195.25**
Recurrent personnel management services: Staff/personnel Payroll & Banking Administration & Management (annual fee per staff, per calendar year)*	**447.44**
Payroll validation, disbursement (35%) (by Finance)*	156.61
Performance evaluation (30%)*	134.23
Extension, promotion, entitlements (30%)*	134.23
Leave Monitoring (5%)*	22.37
Contract extension/termination only (for extension more than once a year)	**134.23**
Employment/Reference Letter	**7.52**
Language Proficiency Exam per exam per person	**176.74**
HR related queries (per case- applicable to HR focal points and/or heads of agencies)	**7.52**
Interns management*	**67.92**
UN agencies survey (housing; cost-of-living survey; hardship, etc.) per agency per survey	**21.23**
Procurement Services	
Procurement process involving local CAP and<u>RACP/ACP submission</u> (and/or ITB, RFP requirements)*	**972.97**
Identification & selection (50%)*	486.48
Contracting/issue purchase order (25%)*	243.24
Follow-up (25%)*	243.24
Procurement process involving local CAP (and/or ITB, RFP requirements)*	**524.49**
Identification & selection (50%)*	262.24
Contracting/issue purchase order (25%)*	131.12
Follow-up (25%)*	131.12
Procurement not involving local CAP (low value procurement)*	**206.76**
Identification & selection (50%)*	103.38
Issue purchase order (25%)*	51.69
Follow-up (25%)*	51.69

Consultant Recruitment Process (if not involving CAP/RACP, if CAP/RACP needed relevant costs to be added) *	228.29
Advertising (20%)*	45.66
Shortlisting & Selection (40%)*	91.31
Contract Issuance (40%)*	91.31
Contract issuance- Consultant only *	91.31
CAP Committee review only (for all procurements and IC)	229.85
CAP Chairperson review only for RACP/ACP submissions (including Sr. Mgmt. review/endorsement)	232.85
CAP Chairperson review and RACP submission for all procurements & IC (including Sr. Mgmt. review/endorsement)	355.65
Transfer of project assets (vehicle) per case	199.88
Transfer of project assets (equipment) per case	110.89
Travel Services	
Visa request process/Note Verbale only	39.14
Outgoing Visa process (Full Process including Note Verbale)	81.86
Incoming Visa process (Full Process including Note Verbale)	92.96
Ticket booking and purchasing per ticket (Local) and/or Reissuance / Cancelation)	14.80
Ticket booking and purchasing per ticket (International) and/or Reissuance / Cancelation	33.29
Hotel reservation (per reservation)	22.20
Travel authorization per person*	33.36
F10 settlement per case (for travel without advance payment)	11.83
F10 settlement per case (for travel with advance payment)*	30.53
General Services	
Vendor profile (Creation or Modification)*	19.3
Issuing the UN/MFA ID card*	36.55
Advertisement only	117.23
Disposal of equipment*	267.18
Custom clearance for air freight shipment (whole process) **	1137.53
Custom clearance for land freight shipment (whole process) **	1462.10
MFA Permission (i.e. Tax Exemption, Plate, License, Satellite License)	75.53
Shipment arrangement (or shipment arrangement for reassignment/relocation)	66.59
Donation documentation only	92.69
Event Organization (Outside Office)***	657.89
Vehicle plating and registration (with MFA)	112.34
Home Leave Allowance	44.57
Reassignment / Relocation Allowance /Lump sum	44.39
Education Grant	37.34

19. THE LEGAL ANNEX

20. CO-FINANCING LETTER

ANNEX C: TERMS OF REFERENCE FOR KEY PERSONNEL

Position Titles	*$/ Person Week**	*Estimated Person Weeks***	*Tasks To Be Performed*
National Project Staff / Consultants			
National Project Manager	1,000	13	• Assume operational management of the project according to the project document and policies and procedures for nationally executed projects; • Prepare ToR for all project personnel and consultants to be recruited to assist in implementation of the project; • Prepare and update project work plans, and submit these for clearance to the National Executing Agency and UNDP CO; • Assume direct responsibility for managing the project budget, ensuring that: • Project funds are made when needed, and are disbursed properly; • Accounting records and supporting documents are kept; • Required financial reports are prepared; • Financial operations of the project are transparent and stand up to audit at any time; • Ensuring that financial procedures and regulations for UNDP/GEF projects are applied; • International and National consultants are hired and deliver their outputs on schedule; • Supervise the project staff and local or international experts/consultants working for the project; • Coordinate project implementation with projects and activities carried out by project partners and stakeholders, build partnerships and leverage resources, and • Report to the Implementing Agency and UNDP Country Office on a regular basis.
Project Assistants	300	40	• Provide necessary assistance in the operational management of the project according to the project document and the UNDP/GEF procedures. • Draft correspondence on administrative and program matters pertaining to the Project Office responsibilities; • Undertake all preparation work for procurement of office equipment, stationeries and support facilities as required; • Undertake preparation for project events, including workshops, meetings (monthly, quarterly and annual), study tours, trainings, etc. This also includes preparation of background materials for use in discussions and briefing sessions on project matter; • Logistical arrangements. This includes visa, transportation, hotel bookings for project staff, consultants and invited guests coming for project activities; • Assist in preparation of project work plan and reports; • Prepare regular list of events for sharing of information within project staff and outside; • Assist with project communication activities, including publications;

			• Assist with preparation of TORs and contracts for consultants/experts for project activities; • Calculate and prepare staff time records
Accountant	500	12	PLANNING • Prepare quarterly advance requests to get advance funds from UNDP in the format applicable. • Assist the PM and NPD in project budget monitoring and project budget revision. ACCOUNTING/REPORTING • Set up accounting system, including reporting forms and filing system for the project, in accordance with the project document and the UNDP/GEF procedures. • Prepare project financial reports and submit to PM and NPD for clearance and furnish to UNDP as required. • Reconcile all balance sheet accounts and keep a file of all completed reconciliation. CONTROL • Check and ensure all expenditures of project are in accordance with UNDP/GEF procedures. This includes ensuring that receipts are obtained for all payments; • Check budget lines to ensure that all transactions are correctly booked to the correct budget lines; • Ensure documentation relating to payments are duly approved by the NPD; • To continuously improve system & procedures to enhance internal controls are satisfy audit requirements. INVENTORY REGISTER • Maintain a proper inventory of project assets register, including numbering, recording, and reporting; • Maintain the inventory file to support purchases of all equipment/assets.
Chief Technical Adviser	3,000	30	• Support the NPM in setting up and managing the project during the first two years (part-time role, approx. 25% of the time) • Prepare TORs for international consultants and assist in preparing TORs for national technical experts • Assist in recruiting suitable national and international technical experts • Provide technical backstopping to all activities of the project during the first two years of the project, for technical matters as well as project management and reporting requirements • Assist in documentation of lessons learned throughout the project
Justification for travel, if any: The NPM may be required to travel to international conferences and meetings to obtain information from and exchange experiences with other GEF and non-GEF projects as well as present (interim) results of the project there. International experts will be required to travel on mission to Iran for their role in the project.			
For Technical Assistance			
Local			

Legal, Institutional and Policy Expert	600	50	• Perform review and analyses of the existing energy policy, building regulations and heating products standard and label frameworks with the assistance of the EE policy and institutional consultant. • Coordinate the development of the necessary proposals for amendments in the current legislation • Initiate and coordinate the inter-ministerial and public consultations on the amendments • Together with Building Code and Heating products experts and the international building code and heating products standards and labels consultant/s develop and propose mandatory state codes for thermal performance of buildings, review and update existing heating products standards and develop new heating product standards, where they do not exist • Together with Building Code and Heating Product experts develop and propose product standards for building components e.g. double pane windows. • Together with Building Code and Heating products experts, the EE policy and institutional consultant and the international building code and international heating products standards and labels consultant/s coordinate the development of Enforcement strategies and Mechanisms for compliance with building code requirements and heating products S&L • Coordinate the development of cross-sectoral energy efficiency strategy • Coordinate follow up actions for strategy implementation including definition of clear institutional roles, coordination with central and local governments, etc. • Together with the capacity building expert identify and assess key stakeholder groups to be included in capacity building activities. • Together with relevant experts assess and analyse lessons learned from project activities and develop bi-annual reports to project manager
Building Codes Expert	600	50	• Review and analyse existing building regulations, identify gaps and propose improvements in terms of building thermal performance, with the assistance of the international building code and heating products standards and labels consultant/s, taking into account relevant international good practice on building codes. • Together with Legal, institutional and Policy expert propose and develop mandatory state codes for thermal performance of buildings • Together with Legal, institutional and Policy expert and with the assistance of the international building code and heating products standards and labels consultant/s, propose and develop mandatory state codes for thermal performance of building components • Participate in the development of enforcement strategies and mechanisms for compliance with building code requirements • Assist the Legal, institutional and Policy expert in coordinated strategy development and implementation.

			• Advise the pilot project coordinator in identifying cost-effective energy saving measures to be used in pilot project. • Advise the capacity building expert in assessing heating product manufacturers and other members of the supply chains' training needs.
Heating Products Expert	600	40	• Review and analyse existing heating products standards and label framework in the country with the assistance of the international heating products standards and labels consultant/s • Collect information on internationally adopted S&L policy for heating products (including SWHs),, identify on-going international collaboration activities • Together with Legal, institutional and Policy expert and with the assistance of the international building code and heating products standards and labels consultant/s, propose and develop new energy standards and labels for heating products • Participate in the development of enforcement strategies and mechanisms for compliance with heating products standards and labels (including testing and certification procedures), with the assistance of international heating products standards and labels consultant/s • Review existing certification laboratories, their capacity to perform certification according the S&L standards. • Propose a work program to expand the testing laboratories and testing capabilities in order to meet the requirements of an effective compliance system. • Advise the pilot project coordinator in identifying cost-effective energy saving measures to be used in pilot project. Advise the Capacity building expert in assessing heating product manufacturers and other members of the supply chains' training needs.
Pilot Project Coordinator	600	30	• Overall coordination of activities under Component 2 – Implementation of the Pilot for the existing building stock • Coordinate the identification of suitable government buildings for the pilot demonstrations • Coordinate energy audits for the selected buildings. • Based on the audit results and the advice of the building code and heating product experts identify cost-effective energy saving measures to be implemented. • Coordinate demonstration projects overall implementation • Recruit suitably qualified engineers to undertake energy audits and install suitable energy saving measures. • Coordinate the development and implementation of solar water heater program in some of the selected buildings. • Evaluate the results from demonstrations and provide input for the development of guidelines and training materials for retrofitting heating systems based on experience and results achieved from pilots • Identify and document lessons learned from the capacity building activities

Capacity Building expert	600	40	• Identify and assess key stakeholder groups to be included in capacity building activities (building and heating professionals, manufactures of equipment, developers, architects, banks and financial institutions ext.) with the assistance of the Legal, institutional and policy expert. • Identify training needs; develop capacity building strategy in consultation with the international capacity building expert. • Coordinate implementation of the capacity-building activities within the project (Output 2.4 and Component 3), incorporating the guidelines and training materials derived from the pilot phase of the project. • Undertake detailed assessment of heating system manufacturers training and technical assistant needs to improve efficiency of their products – design, production lines, etc., with the assistance of the building codes and heating products experts. • Develop strategy for manufacturers support including various training activities and exchange of information and expertise with foreign equipment producers and coordinate training and technical assistance activities with the assistance of the international Building code and heating products standards and labels consultant/s • Undertake detailed assessment of building supply chain stakeholders training needs and develop strategy for capacity development • Coordinate the development of guidelines and training materials (including e-learning courses), the incorporation of this material within existing training (including relevant degree courses) and the implementation of capacity building activities • Identify and document lessons learned from the capacity building activities
Training Coordinator	400	40	• Assist the capacity building expert in the implementation of capacity building and training activities • Participate in drafting guidelines and training materials, including the e-learning course • Provide operational support to the e-learning course; ensure its smooth operation • Collect participant feedback on training and capacity building activities, record this in clear overviews and provide summaries to the project management • Maintain a record of training and capacity building activities and the individuals who participated in these.
GHG analysis expert - Monitoring	500	78	• Collect and analyse information, characterizing current energy demand for space and water heating • Participate in the development of methodology for measuring building and heating system performance and related emission reduction • Develop and implement structured monitoring and evaluation system to monitor and assess energy demand and savings in buildings for space and water heating • Provide regular monitoring reports to PM • Develop mid-term and final monitoring reports including calculated direct and indirect energy savings

			and CO2 emission reductions, as well as forecast for future reductions after project completion.
Financial Expert	600	20	• Collect information and analyse various financial and other marketing strategies schemes implemented in various countries to transform the market towards energy efficient appliances and equipment in consultation with the international Financial incentives consultant • Develop financial and economic analyses for the implementation of different financial incentive schemes for households • Coordinate the negotiation with different stakeholders on selected incentive scheme implementation • Coordinate the development and implementation of capacity building activities for banks and financial institutions
Information & Communication Expert	600	20	• Develop and coordinate the implementation of the project communication and awareness strategy, targeting different stakeholders groups; • Identify key partners in the implementation of the strategy including government, private and NGO organizations, media • Coordinate public awareness campaign linking energy efficiency with lower fuel bills. • Coordinate consumer surveys pre and post awareness campaigns. • Coordinate surveys to monitor the amount and quality of training of building professionals and boiler room operators • Coordinate the implementation of campaign of solar water heaters introduction
International Advisors/Consultants			
Chief Technical Adviser	3,000	30	• Support the NPM in setting up and managing the project during the first two years (part-time role, approx. 25% of the time) • Prepare TORs for international consultants and assist in preparing TORs for national technical experts • Assist in recruiting suitable national and international technical experts • Provide technical backstopping to all activities of the project during the first two years of the project, for technical matters as well as project management and reporting requirements • Assist in documentation of lessons learned throughout the project
EE Policy and Institutional	3,000	20	With local experts: • Assess the existing energy policy, building regulations and heating products standard and label frameworks. • Propose necessary amendments in the current legislation • Analyse existing institutional capacity to introduce and enforce building codes and heating products S&L; design training modules to meet existing needs for capacity building.
Building Code and Heating	3,000	20	• With local experts:

Product Standards and Labels			• Assess existing buildings regulation system, assess gaps and propose necessary amendments in the regulations • Analyse internationally adopted S&L policy for heating products, identify on-going international collaboration activities and propose S&L policy development plan for heating products • Undertake consultation on the development of the building code for thermal performance of buildings, testing standards, minimum energy performance standard and labelling regulations for heating products • Develop proposal for enforcement strategy and mechanisms for compliance based on identified gaps • Assess existing certification laboratories, their capacity to perform certification according the S&L standards, develop recommendations for improvement • Undertake consultations on the cost-effective energy saving measures to be implemented in pilot projects • Assist the local and international capacity experts in developing a strategy for manufacturers support including exchange of information and expertise with foreign equipment producers
Capacity Building to Manufacturers and Building Chain Professionals	3,000	12	• With local experts and international Building code and heating products standards and labels consultant • Design capacity building plan focused on manufacturers and supply chain stakeholders based on analysis provided by national consultant, • Analyse stakeholder's capacity building needs and propose training modules and technical assistance plan,
Monitoring and GHG Analysis Expert	3,000	8	• Development of methodology for measuring building and heating system performance and related emission reduction • Develop monitoring and evaluation system to monitor energy demand and savings in buildings for space and water heating
Financial Incentives	3,000	8	• Provide international best practice and an overview of possible financial support schemes and other marketing strategies • With local experts analyse and assess possibilities of introduction of such schemes in Iran
Awareness & Communication	3000	12	• Provide international and best practise experience on the implementation of energy efficiency communication and awareness raising campaigns for different stakeholders groups; • With local experts identify key partners in the implementation of the strategy, including government, private and NGO organizations and media • Review international best practise for solar water heaters introduction and report on this to the local team.
Justification for travel, if any: National technical experts will be required to travel to international conferences and meetings to obtain information from and exchange experiences with heating system retrofit projects in other countries in similar conditions. International experts will be required to travel on mission to Iran for their role in the project.			

Annex D: Iran Energy Policy Analysis

Policy instruments	Existing structure	Shortcoming[10]
Regulatory framework	Vision 2025, Grand strategies, five year development plans, budget laws, and by-laws.	No comprehensive energy policy document; no comprehensive program on energy efficiency; non-transparent laws and regulations; no information centres; Lack of data related to energy efficiency and energy consumption
Decision making	MoP is the major player; a large number of governmental institutions are also involved	No unified body responsible for implementation of laws and policies; limited capacity in the only organization dealing with energy efficiency; parallelism between institutions and lack of coordination and communication between major stakeholders
National building regulations and standards	Chapter 19 of national building regulation code. The code is enforced.	Single thermal zone for residential units; Inappropriate climatic zoning of country due to insufficient information; lack of data on air change rate; lack of validated information on solar gain; lack of trained engineers to conduct the accurate inspection; weak enforcement
Construction materials and supply standard	No standard is developed yet.	Lack of information on domestic construction materials that cause in accuracy in analysis
Energy appliances standard (performance and safety)	INSO is in charge; few standards for performance and safety have been developed.	The main types of heating system are not covered; only a very limited number of devices are standardized; the enforcement is very weak and unreliable; imported goods are not adequately controlled due to lack of infrastructure or standards.
Energy appliances standard (energy consumption)	No standard is developed for central heating system equipment No standard exists for solar water heaters but a comparison based performance test is developed	Inspection and enforcement is not adequate; the benchmark model that is used as the measure of standard is itself is not tested for meeting standards
Energy labels and communicative measures	No energy label is developed for central heating system equipment; few standards exist for heaters and water heaters	Inaccuracy in the labels issued for heaters; manufacturers of heaters use labels as marketing tools and there is no penalty for unlabelled products

10 The list of shortcomings given here was one of the inputs to the barriers analysis as described in section 1, of the proposal (SITUATION ANALYSIS). All barriers were considered and those which were rated as high priority are addressed by the proposal.

Policy instruments	Existing structure	Shortcoming[10]
Energy efficiency testing facilities	There are no energy efficiency testing facilities to test the energy performance of central heating system components. BHRC and ISNO[11] are considering a number of initiatives.	
Energy auditing	Energy auditing is mainly conducted in the industrial sector and some governmental buildings.	Lack of unified body that supervises energy audits. Parallelism e.g. SABA tests electricity consuming appliances, IFCO tests fossil fuel consuming appliances. However energy audits should have a holistic approach.
Public awareness	MoP and MoE are active in this field along with their subsectors	Public outreach is not being done adequately and properly; on some occasions incorrect information has been disseminated; parallelism and lack of coherent plan; lack of coordination between different sectors
Education and training	IFCO, TVTO[12], MoE, MoP, SABA are all involved in training. One training programs has been launched through SABA and GEF fund. No specialized degree or diploma in HVAC is offered.	Lack of skilled workers; lack of comprehensive educational program for workers (i.e. diploma or certificate in HVAC); insufficient attention to HVAC training in universities and colleagues as well as technical schools
R&D in energy efficiency	BHRC and SABA are in charge of R&D in residential energy efficiency. Also, the R&D budget of MoP in 2008 was 46 million USD; however, it is not clear what share of it is dedicated to energy efficient technologies in residential sector.	No comprehensive research plan; parallelism and lack of coordination between two institutions, insufficient relationships with universities and schools; Inadequate or no commercialization of research findings (both government institutions and academia); insufficient funding.
Financial incentives	Very limited and temporary financial incentives for households adopting high energy efficiency heating devices. These incentives were in the form of subsidizing the manufacturer to supply the equipment with lower price. No financial mechanism through utility companies have been developed	No direct financial incentives for households to adopt higher efficiency energy equipment; the funds and supports to industry were temporary and uncertain.

[11] The Institute of Standards & Industrial Research of Iran (ISIRI)

[12] Iran Technical and Vocational Training Organization (TVTO)

ANNEX E: PROBLEMS ANALYSIS AND SOLUTIONS LIST

This list of problems and solutions were generated by attendees of a logical framework Workshop discussing this project. Their unedited responses are listed here.

PROBLEMS	SOLUTIONS
1. Low technical quality of heating systems	**Improve technical quality of heating systems**
1. Lack of proper maintenance 2. A large number of burners in Iran market and also are already installed in the buildings have a low efficiency and have outdated technology 3. Lack of using new technology in designing and building burners and boilers [people use old model copy the technology and manufacture it] 4. Normally boiler capacity is considered the only measure to choose burner, whilst there are other characteristics that are important to consider 5. The major problems in boiler room are exhaust, lack of continuous maintenance, mismatch between burner and boiler due to lack of information in installers or seller that decide in place of an engineer 6. No thermostatic valve on radiators 7. The burners are not tuned 8. Controlling systems do not match with present setting 9. The inlet water is cold, it should be warmer 10. Intentional heat loss in buildings due to leaving doors and windows open 11. Low efficiency in heating systems and heaters 12. Lack of insulation in boiler room and residential buildings 13. Using low efficiency systems 14. Lack of doing infiltration insulation (around windows) 15. Heat leak from exhaust 16. Lack of a proper balance between inside and outside temperature 17. Same heating system for heating and water heating 18. Low efficiency in burners and boiler 19. incomplete combustion in combustion chamber 20. No time control for burners 21. Lack of using room temperature thermostat instead of the ones installed on radiator 22. Lack of temperature comfort level in CHS 23. Oversize design for CHS It is easy to use low quality system 24. No proper implementation and design of CHS, we don't have a technical	1. Control and incept the performance conditions of automation instrumentations of boiler room and adopting based on conditions and cultural and social aspects 2. Making mandatory, using intelligent and electrical valve as a the cheapest and most effective measures 3. Using turbolators in boilers 4. Using the hydrogen production and injection system 5. Using PLC and thermo control system 6. Using Solar system 7. Replacing the burner (on-off) controllers with proportional controllers (modulation) 8. Replacing immediately all atmospheric burner with high efficiency one 9. Installing filtration and water softener at water inlet 10. Insulating all piping and storages, particularly expansion tank 11. Integrate SWH into system 12. Using proper thermostat in boiler room or on radiators 13. Proper insulation of boiler room components 14. Using standard burners and proper matching with boilers 15. Increasing the efficiency of boilers 16. Using thermostat in boiler-room 17. Better insulation of boilers 18. Proper design of exhaust 19. Using standard burners 20. Using standard boilers 21. Adopting intelligent controller. and sending on/off signal based on DELTA T 22. Using proper hot water storage during night time 23. Immediate action in tuning the burners 24. Proper selection of boiler, burner, storages, and pumps 25. Accurate calculation of heat load of the building 26. Replacing CHS with packaged system in independent units if possible, and design piping systems along with separating NG and water meters 27. Replacing CHS in existing buildings by condensing CHS 28. Adopting SWH and integrate them in existing boiler room 29. Providing sufficient air flow for complete combustion in the burner with high efficiency

engineering design, it is mostly done by craftsmen without appropriate skills 25. Low quality maintenance 26. Producing low efficiency systems	30. Control exhausts of boiler room and make sure the correct performance 31. Disseminate a special packaged system C type, with special exhaust system 32. Adopting low cost hydrogen production and injection system in existing and new boiler room 33. Using solar system 34. Using energy management system in boiler room 35. Replacing old burners with new burners 36. Adopting intelligent controllers and electrical valve to stabilize the comfort temperature 37. Iran has 286 sunny days and using solar water heaters is appropriate
2. Lack of enforcement of energy standards	**Improve enforcement of energy standards**
1. The regulations are not mandatory, there is no guarantee in their accurate implementation 2. No supervision from municipality on implementation of code19 3. No implementation of current regulations 4. Lack of capacity to implement standards 5. Current and existing standards are not enforced and implemented 6. So many buildings without any standards or measures of EE implemented in them 7. Code 19 is not implemented well, (i.e. improper wall and roof insulation) 8. Municipality don't follow up on implementation of code 19, improper implementation of code 19 9. Lack of proper supervision on implementation of EE projects in buildings 10. There is no responsible unit in charge of building testing facility 11. No budget for building testing facilities 12. No assistance to equip testing facility for particularly water heaters 13. People suspect the performance of control system and solar system 14. Not eliminating permission for furnace (burners) in buildings due to safety issue 15. In responsiveness of constructor about the quality of heating system and building after the sale	1. Founding comprehensive inspecting firms and specialized building insurance companies 2. Equipping testing facility for boiler 3. Engine room and HVAC shall be approved by third party such as engineering organization 4. Not issuing contrition completion certificate for the buildings without appropriate systems 5. Creating an inspection units in municipality for issuing permit for new buildings with high enforcement capability 6. Preparing testing ground for the standards
3. Lack of public awareness about energy efficiency	**Raise public awareness about energy efficiency**
1. Lack of public awareness and informational campaign and educational activities 2. Lack of Public education, in appropriate advertisement through media,	1. Changing attitude toward rational consumption 2. Information dissemination by the related organization as IFCO NIGC, and make more attention to low cost and high return measures

3. Cultural issues and lack of awareness about the high efficient technology 4. Improper culture of consumption 5. Lack of training for lay public on EE 6. Most of consumers, are people that personally decide on heating system and traditionally install central heating system 7. Selecting boilers and their capacity without sufficient information regarding the burner capacity, and mismatch between them 8. Insufficient information about EE among households 9. Lack of attention on public awareness in EE 10. High efficiency technologies are not introduced to people properly 11. Lack of information about the polluting characteristics of heating system	3. Changing attitudes toward comfortable temperature and using proper clothing according to season 4. Changing attitude of consumers and craftsmen toward intelligent controllers 5. Public awareness 6. Changing attitude and multimedia advertisement 7. More advertisement regarding EE in TV and radio through a comprehensive plan 8. Educating people 9. Changing attitude toward comfort temperature through public media 10. Changing attitude and media advertisement 11. Encouraging people to replace their old equipment. 12. Installing separate meters for residential units (low cost or free) in order to create incentive for energy conservation
4. Lack of coordinated energy efficiency policy	**Coordination of energy efficiency policy**
1. Lack of unified body of policy making 2. Formulating timely policies and clear regulations (no comprehensive timely policy) (with milestones) 3. There is no accurate and appropriate statistics and information on the heating system situation (nationwide) 4. No comprehensive and appropriate planning that can reach to a solid conclusion 5. Insufficient inspection of energy labels on heater and water heater 6. Lack of unified management 7. It doesn't look like per capita consumption is higher than other places but the trends are worrisome. Some decisions are made without long term planning 8. ISRI is under industries and mines ministry, it should be independent unit	1. Have a unified body that deals with energy issues 2. Integration of organization which involved in energy in Iran and following this subject seriously 3. Unified body in order to increase energy efficiency 4. Do not implement the laws and formulate policies subjectively and selectively in high governmental scales 5. Having commitment to the plans and policies in energy efficiency
5. Lack of energy standards	**Introduction or modification of energy standards**
1. Lack of sufficient standards to control products 2. Lack of necessary guarantees for consumers (they don't know the result of EE measure) 3. No rating on energy appliances 4. Lack of comprehensive and related standards 5. There is no guaranteed on the proper implementation of regulations and standards 6. Low priority for developing packaged system standards 7. Overemphasizing on building envelope in code 19 and lack of attention on heating system	1. Development related standards by ISIRI 2. Modifying national building regulations and paying attention to the missing points and eliminating the related issues and conflicts 3. Updating code 19, with aim to reduce energy consumption in buildings 4. Developing standards for construction materials 5. Developing standards for heating system 6. Developing standards and energy labels for energy consumption 7. Developing energy labels for CHS, including boilers 8. Making building energy label mandatory

	9. HVAC design details to be mandatory for construction 10. Development of energy labels for buildings 11. Building certification 12. Using energy labels for all energy consuming products 13. Making code 19 mandatory through not issuing completion certificate to engineers and create incentives to builders 14. Making code 19 mandatory for municipality and assigning fine for not compliance 15. Using comprehensive and practical standards
6. Lack of energy-efficient products	**Increase availability of energy-efficient products**
1. Low quality in some of new technologies such as some solar systems 2. High efficiency products do not exists and are not manufactured 3. It is easy to use low quality system 4. No proper implementation and design of CHS, we don't have a technical engineering design, it is mostly done by craftsmen without appropriate skills 5. Low quality maintenance 6. Producing low efficiency systems	1. Providing information to manufacturer of pumps, burners, and boilers to change their production process and increasing the efficiency of their products 2. Making the boilers manufacturer to produce boilers with specific heat capacity for each volume capacity 3. Prioritizing projects for manufacturing high quality products with energy labels 4. Importing or manufacturing the high efficiency heating and lighting system with update technology 5. Prioritizing development of packaged system standard due its share in the market in compare with CHS 6. Providing certificates to best manufacturers 7. Transferring and buying new technology that can increase the efficiency of manufacturing boilers and burners
7. Lack of training of professionals	**Training of professionals**
1. Lack of technical knowledge among people, designers and suppliers 2. Not enough skilled people for design and implementation 3. Lack of mandatory professional training courses for boiler and burner manufacturer by a responsible organization 4. The frontline of delivery of products to consumers are the HVAC shops and therefore they should have the right training and information 5. Lack of infrastructure for educational activities, lack of knowledge among the key decision making people 6. Lack of responsible skilled institution in EE	1. Creating infrastructure and financial capacity in order to train and grade skilled workforce 2. More practical courses related to Code 19 for engineers 3. Paying more attention to the courses for technical schools 4. Paying special attention to the traders association of HVAC and increasing supervision and control in this sector 5. Train workers 6. Educating HVAC craftsmen and people as users of intelligent controllers and solar water heaters 7. Training installers and others 8. Training of manufacturing and design sector engineers 9. Provide training course for the HVAC sellers who are the members of the traders association of HVAC in order to get familiarized with proper selection of

	system components and transferring their information to the consumers
8. Poor energy performance of buildings	**Improve quality of buildings**
1. Traditionally, construction is done without insulation, unlike other places 2. No mandatory building insulation 3. No standard developed and enforced on construction material 4. The construction material are not well known and therefore calculation of the heat capacity is not accurate 5. Lack of mass production or industrial construction of buildings, the buildings are made in traditional way	1. Whole building insulation 2. Insulating walls and roofs 3. Introducing building and as a consumer product and make sure the builders are responsible regarding the quality of the building and the installed heating system 4. Insulating the building, using high quality materials, 5. Disseminate double pane windows 6. Make windows modular and standardizing the size, number and the location of the windows 7. Full insulation of buildings
9. Low quality fuel and central heating water	**Improve quality fuel and central heating water**
1. Problem with water hardness in most cities in Iran 2. Low quality water 3. Low quality fuel (gas oil and low heat capacity of NG)	
10. Lack of coordination in building chain	**Improve coordination in building chain**
1. Lack of coordination among key actors 2. Lack of proper connection between construction builders and building users (conflicting interests)	1. Integrated management in construction regulations and practices 2. Creating proper connection, collaboration between stakeholders (organizations) in order to implement the results of the projects
11. Lack of incentives for more energy efficient products and use of SWH	**Introduce incentives for more energy efficient products and use of SWH**
1. No support for manufacturer 2. No incentive for producer to manufacture heaters with efficiency B and C 3. Lack of incentive for manufacturing high efficiency radiators 4. Provide incentives for manufacturing energy devices 5. No incentive for consumer 6. There is no transparent and solid support of ESCOs	1. Create, enhance ESCOs and facilitate their operation, and guarantee the return money saved by household 2. Supporting high efficiency product manufacturer and create incentive packages for consumers 3. Collaboration with Ministry of Industries and Mines to support manufacturer in producing high-efficiency products 4. Firm support the manufacturer to produce high efficient products 5. Firm support of ESCOs 6. Provide subsidy for SWH in high consuming and high population buildings 7. Immediate action with government subsidy to de-scale of boilers 8. Immediate action with government subsidy to insulate water tanks and boiler room piping system 9. Providing financial systems such as leasing for SWH or low consumption, high efficient systems through banking system or IFCO 10. Assigning funding by government to implement the EE measures in the buildings 11. Paying subsidy to industrial manufacturer as Tax incentive and low-rate loan

	12. Incentive policies for consumers, if they implement code 19 and energy efficiency measures in boiler rooms 13. Create and support ESCOs 14. Governmental support of banking system for boiler room retrofit if the standards are developed 15. Providing loan for buying high efficiency equipment and return on utility bills 16. Find a way for obligation of standards for heating and cooling equipment in building by encourage policies for users 17. Increasing the financial capacity of households and lack of incentive in using high efficiency products
12. Other issues	**Solutions to Other issues**
1. All of the mentioned above should be applied in both existing and new constructions 2. Not using low consumption lighting system 3. Lack of standard regarding size, number, and installation of windows [S: 4. Standards should be practical and implementable 5. Energy carriers low price 6. Expectations from room temperature is high (people like hot rooms), the comfort temperature is high	1. Initiating energy efficiency measures in government and related sector 2. Pilot execution in official buildings, documentation of the results 3. Few pilot buildings in the private sector 4. Constructing new pilot buildings by adopting techniques such as integration of SWH, CCHP, wall insulation and roof, double pan window, intelligent controllers, thermostatic valve, and use them as the pilot for Mehr construction project 5. Introducing projects in EE fields and providing accurate statistics and appropriate climatic zoning and categorizing the issues 6. Considering of energy level and certification in building price 7. ESCO development

Conditions required for positive change

1. Consider building sector as a national asset (treasure) and emphasizing on supporting consumers
2. Presence of standards and related testing facilities
3. Transparency and clear responsibilities and limitations of related organizations
4. Creating educational facilities
5. Educating the trainers
6. Developing and Modifying courses syllabus
7. Work ethics and procedures as well as guidance
8. Collaboration and coherency
9. Proper feasibility study for different measures

Actions required for positive change

1. Formulating policies to support building insurance firms and inspecting and controlling firms
2. Completion of standards and procedures
3. Formulating policies in support of development of standards and testing facilities
4. Adopting incentive policies
5. Provide funding for preparing educational materials, educating trainers, creating specialized training facilities
6. Integrate the energy related sectors of all ministries

ANNEX F: INCREMENTAL COST ANALYSIS

Global Environmental Objective
The global environmental objective of the project is the reduction of GHG emissions by reducing energy demand for heating and water heating in residential and commercial sector buildings in I.R. Iran.

Base Case
The base case scenario is meeting the heating energy needs primarily by increasing the use of fossil fuel, mainly natural gas, for space and water heating and the implementation of low ambition building codes and a modest amount of low cost heating system and SWH retrofitting measures in response to the Iranian government's existing baseline activities.

In the base case, I.R. Iran will introduce revised building energy codes, but these would cover only building shell insulation measures, which reduce heat losses but do not address the very substantial energy losses from the use of inefficient, out-dated heating technologies. We estimate that this baseline building energy code would reduce the average energy demand for new buildings from the current average of 277kWh/m^2/year to 221kWh/m^2/year, a 20% improvement.

In the base case, I.R. Iran will also continue its removal of energy price subsidies. However, as there would be fewer opportunities for consumers to reduce their energy bills through energy efficiency measures, it must be expected that this process will continue at a slower pace. International research shows a convincing, if hard to quantify, relationship between energy prices, availability and cost of energy efficiency measures and energy demand reduction. The effect of this interaction cannot be quantified, but we can qualitatively assume that the impact of energy subsidy reduction on energy demand will be less in the baseline (than in the alternative case).

The Ministry of Petroleum will implement its solar water heater (SWH) installations in government buildings, as it has been doing for several years. It will not start new pilots implementing boiler room improvements in government buildings, although it has conducted several pilots in recent years. A designated agency will also initiate training in the implementation of energy efficient technologies for, among others, 5000 skilled workers, 2100 building managers, as well as public awareness activities. Finally, BHRC will start developing test laboratories for boiler room components, solar water heaters and gas-fired appliances. However, there will be no integration of these activities, with building energy code developments and no follow-up with a comprehensive market transformation strategy.

Alternative (Project) Cases
In the alternative scenarios, space and water heating needs are increasingly met by improved heating technologies. Boiler rooms supplying heat to larger buildings will have been upgraded to improve their efficiency, new stand-alone heaters will have improved energy efficiency and solar water heaters are increasingly used to produce hot sanitary water. This drastically reduces the need for fossil fuel-based heating.

In the project alternative case, I.R. Iran will address heating system and heating product efficiency in its building energy code, requiring that new buildings and major retrofits comply with energy efficiency requirements. Since there is a vast potential for cost-effective modernization of heating technologies, both in new buildings and in retrofit situations, this is projected to reduce the average energy demand for new buildings from 277kWh/m^2/year to 110kWh/m^2/year (similar level as introduced for Turkey several years ago), a significant improvement over the baseline scenario. The introduction of these requirements via the building energy code will open up the market for novel (in the Iranian context) energy efficient technologies to the regular heating system market and regular market parties, starting a much-

needed development of experience with these technologies with all supply chain parties, which in turn reduces costs and leads to improved availability, installation and operation experience.

The removal of energy price subsidies will continue helped by the wider availability of energy efficient technologies, which provide consumers with opportunities to reduce their energy demand and thus mitigate, at least partially, the impact of rising energy prices. As a result, rising energy prices will provide an additional impetus for energy demand reduction, which in turn allows energy subsidy removals to proceed more quickly. As with the base case, this effect can only be described quantitatively.

In the project alternative, MoP will implement its SWH projects as in the baseline scenario. It will also start new pilots implementing boiler room improvements in residential buildings, taking its experience with government buildings into a new sector and starting the transformation of the wider market for heating systems. MoP will initiate training in the implementation of energy efficient technologies, as in the baseline scenario, but will also include the (evaluated) results of pilot projects in this training and link these to various other market transformation activities. The developing of test laboratories for boiler room components, solar water heaters and gas-fired appliances will, in the project alternative, be linked to the introduction of new energy efficiency building code requirements, minimum performance standards and energy labels for boilers, burners, solar water heaters and gas-fired space and water heaters, making these integrated parts of a market transformation. Finally, I.R. Iran will develop a cross-sectoral energy efficiency strategy and a comprehensive market transformation strategy, including a tailored public awareness campaign and the development of financial incentive schemes.

The GHG reduction impact of the project has been estimated as follows:

- Direct GHG emission reductions of approximately 1.0Mton CO_2 over the lifetime of the investments.
- Indirect GHG emission reductions of up to 233 Mton CO_2 over the project impact period (2015-2024) relative to the no policy, of which approx. 153 Mton CO_2 are incremental savings (relative to the base case).

Domestic benefits include a 23% reduction in energy demand for heating and water heating of buildings by 2024, from around 710TWh/year in the base case to around 550TWh/year following full implementation of the project. Further reductions in energy demand are expected in following years. This also leads to substantial reductions in household and commercial sector energy bills. In addition domestic and international competitiveness of domestic industries will improve as a result of investments in more advanced heating products.

Systems Boundary

For estimating the GHG reduction potential of the project, direct GHG emission reductions from reducing energy demand through boiler room and window retrofits as well as from the installation of SWHs in demonstration buildings have been taken into account.

In addition, the project generates substantial amounts of indirect emission reductions, through the legal, regulatory, training, and market transformation mechanisms it puts in place that will generate energy demand reduction in many more buildings. These savings are taken into account as indirect savings.

Summary of the Incremental Cost Analysis

Project Component	Baseline	Alternative	Increment
Component 1: *Legislative, policy and regulatory frameworks*	Under the base case scenario it is anticipated that building codes in I.R. Iran will address *building shell energy losses but not heating system efficiency*; that building code compliance mechanisms will be improved; and that a modest amount of heating system and SWH retrofitting will take place in response to on- going government baseline activities.	Building codes will be updated *to include heating system efficiency next to building shell energy loss reductions*, resulting in substantial energy demand reductions. Energy standards and labels will be developed and introduced for stand-alone space and water heaters Compliance with building code requirements will improve through better compliance checking mechanisms A cross-sectoral energy efficiency strategy is developed which will align programs of many Government departments and agencies to maximize benefits across all programs.	Building codes will be updated *to include heating system efficiency*, resulting in substantial energy demand reductions Energy standards and labels will be developed and introduced for stand-alone space and water heaters Compliance with building code requirements will improve through better compliance checking mechanisms A cross-sectoral energy efficiency strategy is developed which will align programs of many Government departments and agencies to maximize benefits across all programs.
	Cost: USD 6,800,000 (cash, I.R. Iran Government) *Total: USD 6,800,000*	USD 850,000 (GEF) USD 6,800,000 (cash, I.R. Iran Government) *Total: USD 7,650,000*	**Incremental cost:** USD 850,000 (GEF) **Total: USD 850,000**
Component 2: *Implementation of the Pilot for the existing building stock*	Limited, small-scale pilots will be conducted to demonstrate the benefits of building shell improvements. However, there will be no pilots demonstrating the technologies used in and benefits of heating system improvements and the use of solar water heaters. Dissemination of pilot results will be limited, without an elaborated dissemination plan.	Large-scale pilots will demonstrate the technologies used in and benefits of window and boiler room retrofits, and SWH installations to reduce energy losses Large-scale pilot will be systematically evaluated and results will be widely disseminated based on a thorough dissemination plan.	Pilots will demonstrate the benefits of window and boiler room retrofits, and SWH installations Pilot will be systematically evaluated and results will be widely disseminated based on a thorough dissemination plan.
	Cost: USD 10,500,000 (cash, I.R. Iran Government)	USD 2,000,000 (GEF) USD 13,641,760	**Incremental cost:** USD 2,000,000 (GEF)

	Total: USD 10,500,000	(cash, I.R. Iran Government) *Total: USD 15,641,760*	USD 3,141,760 (cash, I.R. Iran Government) **Total: USD 5,141,760**
Component 3: *Implementation of market transformation strategies*	Under the base case scenario no capacity development of heating product manufacturers, specific training or awareness raising on heating system energy efficiency are anticipated although some general awareness raising on energy conservation and energy efficiency will be undertaken that can be considered relevant parallel activities.	The technical capacity of manufacturers to develop and produce energy efficient heating products will be assessed and training and support provided to enable the manufacturing of better products and systems. Building professionals and boiler room engineers will be trained to improve the installation, maintenance and operation of heating systems Stakeholder awareness campaigns will inform market parties and the general public of the importance of heating system energy savings and ways to achieve substantial energy cost reductions, in addition to general awareness raising on energy conservation and energy efficiency Financial incentives and support schemes will be discussed and elaborated with government and financial sector representatives	The technical capacity of manufacturers to develop and produce energy efficient heating products will be assessed and training and support provided to enable the manufacturing of better products and systems. Building professionals and boiler room engineers will be trained to improve the installation, maintenance and operation of heating systems Stakeholder awareness campaigns will inform market parties and the general public of the importance of heating system energy savings and ways to achieve substantial energy cost reductions Financial incentives and support schemes will be discussed and elaborated with government and financial sector representatives
	Cost: USD 5,500,000 (cash, I.R. Iran Government) *Total: USD 5,500,000*	USD 850,000 (GEF) USD 6,300,000 (cash, I.R. Iran Government) Total: USD 7,150,000	**Incremental cost:** USD 850,000 (GEF) USD 800,000 (cash, I.R. Iran Government) **Total: USD 1,6500,000**

Total Costs	Cost: USD 22,800,000 (cash, I.R. Iran Government) *Total: USD 22,800,000*	USD 3,700,000 (GEF) USD 26,741,760 (cash, I.R. Iran Government) *Total: USD 30,441,760*	**Incremental cost:** USD 3,700,000 (GEF) USD 3,941,760 (cash, I.R. Iran Government) **Total: USD 7,641,760**

Global Environmental Benefits	Emission reductions will occur due to reduced energy losses from building shell requirements, amounting to approx. 4 Mton CO_2 p.a. by 2024, and 79 MtonCO_2 cumulatively over the total impact period (2015-2024). This is based on our estimate that base case impacts would amount to around 30% of the expected savings from the advanced building code improvements in this project.	In total, the expected impact is the reduction of 35 Mton CO_2 p.a. indirect savings, plus around 52 ktons CO_2 p.a. direct impact from pilot projects[13]. This annual savings amounts to 233 Mton CO_2 emission reduction cumulatively over the project impact period (2015-2024).	The total estimated incremental impact in Iran is a reduction of 31 Mton CO_2 p.a., amounting to 153 Mtons CO_2 over the project impact period (2015-2024).
Domestic Benefits	Limited energy savings will be achieved under the baseline scenario, thereby creating limited financial benefits for electricity end-users and moreover industry and commerce will reduce their (inter)national competitiveness.	The proposed activities under components 1 to 3 lead to reduced energy consumption, resulting in reduced energy costs, improved competitiveness of the manufacturing of products and provision of processes.	Nationwide in Iran, energy use as a result of the combined direct and indirect impacts would reduce from around 730 TWh/year to around 550 TWh/year by 2024, a reduction of 23% of fuel consumption in residential and commercial buildings. As Iran is becoming a fuel-importing country, this will have a substantial impact on saving foreign currencies. Improved competitiveness and export opportunities for the manufacturing sector, through improved product quality. Reduced residential energy costs, which is especially important now that domestic energy prices are increasing in Iran.

[13] These values are derived in Annex H, below

ANNEX G: CALCULATION OF DIRECT AND INDIRECT PROJECT IMPACTS

The assumptions and calculations behind the modelling of the direct and indirect project impacts are summarised here.

Direct Impacts

Direct project impacts are based on the planned retrofits of buildings in pilot projects (Component 2). The retrofits include: windows, boiler rooms, solar water heaters (SWH) installations.

I. Inputs

- Building numbers: 100 government buildings for window retrofits; 80 government buildings for SWH installations; 330 residential buildings for boiler room retrofits.
- Assumed average floor size per government building: 10,000m^2
- Assumed average floor size per residential building: 50 units x 104m^2 = 5,200m^2
- Assumed base case energy demand: 277 kWh/year.m^2 (space & water heating); 195 kWh/year.m^2 (space heating only); 82 kWh/year.m^2 (water heating only)
- Assumed energy demand reduction: 10% (window retrofit); 40% (boiler room retrofit); 80% (SWH installation)
- Assumed system lifespan: 30 years (windows); 20 years (boiler room retrofits & SWHs)

II. Calculations

Building retrofits

Inputs	
Number of buildings - window retrofit	100
Number of buildings - boiler room retrofit	330
Assumed average floor area per building government (m2)	10,000
Assumed average floor area per building residential	5,200
Assumed base case energy demand - space and water heating (kWh/year.m2)	277
Assumed base case energy demand - space heating (kWh/year.m2)	195
Assumed energy demand reduction - window retrofit	10%
Assumed energy demand reduction - boiler room retrofit	40%
Assumed lifespan window retrofit (years)	30
Assumed lifespan boiler room retrofit (years)	20
Annual energy demand reduction - window retrofit (GWh/yr)	19
Cumulative energy demand reduction - window retrofit (GWh)	584
Annual energy demand reduction - boiler room retrofit (GWh/yr)	190.30
Cumulative energy demand reduction - boiler room retrofit (GWh)	3,806
Cumulative energy demand reduction - subtotal (GWh)	4,390
Cumulative CO2 impacts - subtotal (kton CO2)	865

SWH installations

Inputs	
Number of buildings - SWH	80
Assumed average floor area per building (m2)	10,000
Assumed base case energy demand - water heating (kWh/m^2/yr)	82
Assumed energy demand reduction - SWH	80%
Assumed Lifespan SWH (years)	20
Annual energy demand reduction - SWH (GWh/yr)	53

Cumulative energy demand reduction - SWH (GWh)	1,056
Cumulative energy demand reduction - subtotal (GWh)	1,056
Cumulative CO2 impacts - subtotal (kton CO2)	208

III. Results

- Annual energy savings of 260 GWh/yr (9 TJ/year)
- Cumulative lifetime savings of 5,500 GWh (20,000 TJ)
- Cumulative CO_2 impacts of 1,000 ktons

No direct post-project impacts are assumed.

Indirect Impacts

Based on international best practice a building stock and heating systems turnover model was developed in order to assess the indirect impacts of the project. A number of different "Outcome" scenarios were modelled, and compared against a base case.

I. Standard Inputs

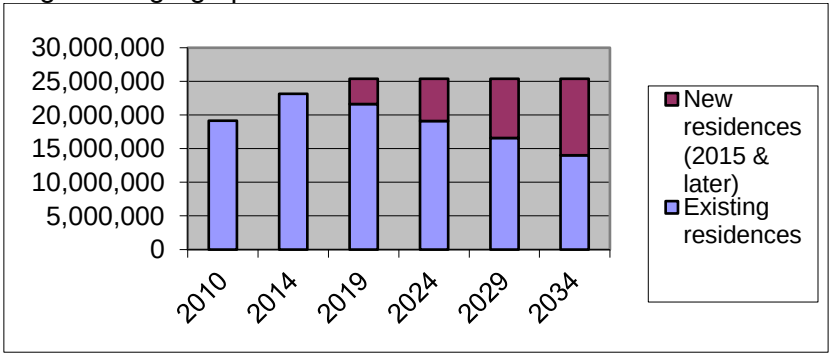
The following assumptions were made for all the scenarios modelled (unless stated, assumptions are based on 2006 data)

Housing stock

- Housing stock figures were drawn from a number of sources including 2006 census data, Ministry of Housing historical figures and projections and Iran's Vision 2025 strategy. The following reconciled figures were used in the modelling:

Year	Number of dwellings (in thousands)
2006	15,860
2007	16,690
2008	17,490
2009	18,290
2010	19,140
2011	20,050
2012	21,020
2013	22,070
2014	23,170
2015	24,270
2016	25,370
2017	25,370
2034	25,370

- From 2016 2% of old dwellings are demolished and replaced with new buildings, but the total number of dwellings remains constant (modellers' assumption). This results in the following building age profile:



- The average floor area of residential dwellings is taken to be 104m^2.
- The number of dwellings with central heating systems will remain constant at 5.5%
- 8% of dwellings do not have mains water supply, and are therefore not suitable for retrofitting/replacing heating systems or for retrofitting SWHs
- All new buildings will have mains water supply

Residential Energy Use

- The average residential annual energy use per m^2 of dwelling is taken to be[14]:

Energy Carrier	BOE/ORU	kWh/m^2	Space Heating	Water Heating	Cooking
Natural Gas	14.33	234.06	153.07	67.41	13.58
Kerosene	2.49	40.61	32.32	8.2	0.08
LPG	0.69	11.25	5.75	5.11	0.39
Gas Oil	0.33	5.40	3.63	1.76	0.00

Emissions factors

- The modelling uses international figures for GHG emissions by different fuels. Variations in the emission factors for these fuels are marginal.
- When weighted by residential energy use, this gives an average emissions factor of 0.055kton CO_2/TJ

Non-residential buildings

- Based on non-residential stock numbers from 2001 and the fact that non-residential buildings are likely to be larger than residential units and have a greater energy use, the modellers have assumed that non-residential energy use (and savings) will be that of the residential sector plus 20%.

Compliance

- Minor non-compliance results in average energy use of 10% over the specified maximum
- Major non-compliance results in average energy use of 50% over the specified maximum

Project impacts over lifetimes of investments

- The GEF methodology of calculating project impacts over the lifetimes of investments has been applied: new impacts are added up to 10 years after the end of the project and then savings are accumulated until the end of their lifetime
- The lifetime of investments is conservatively assumed to be 20 years.
- The one exception to these assumptions is under those Outcomes which assume the introduction of more ambitious building codes (Outcomes 1a and 1b). It is unreasonable to assume that following the end of the project that these codes will revert to less ambitious levels. Therefore it is assumed that new buildings will continue to meet the ambitious building codes after the end of the project, and the lifetime of each new building code-compliant building is assumed to be 20 years.

II. Scenario assumptions

A. No policy case – represents what would happen without any new policy or baseline activities

[14] This data (as quoted earlier in the ProDoc) corresponds well with 2008 IEA data for Iran: http://www.iea.org/stats/balancetable.asp?COUNTRY_CODE=IR

B. Base case – represents the implementation of a low ambition building code for new buildings from 2015 and some low-cost retrofitting measures undertaken in existing buildings in response to IFCO baseline activities and public awareness raising campaigns.
   - Based on modellers' best estimates it is assumed that a revised building code will require better wall and roof insulation, resulting in a 20% reduction of energy use for new buildings from 2015 onwards. This will reduce energy use to 222 kWh/m^2 (83 GJ/dwelling).
     Levels of compliance are assumed at: 25% full compliance, 50% minor non-compliance; 25% major non-compliance
   - Based on IFCO baseline activity data, it is assumed that 4,000 dwellings with CHSs will have systems refitted each year between 2012-2015
   - Based on IFCO baseline activity data it is assumed that 9,000 dwellings will have SWHs systems retrofitted each year between 2012 and 2015.
   - In response to public awareness raising campaigns, 1% of non-CHSs heating in existing dwellings will be retrofitted each year up to 2012- 2024
   - All dwellings which have CHSs refitted will have SWHs fitted.

C. Scenario 1A – represents the implementation of an ambitious building code for new buildings from 2015, as a result of the GEF project
   - The project-led building code set maximum energy usage at 40% of the 2006 average (international experience suggests that this level is easily achievable).
   - Compliance levels are the same as the base case

D. Scenario 1B- represents the implementation of an ambitious building code for new buildings from 2015, as a result of the GEF project
   - The project-led building code set maximum energy usage at 40% of the 2006 average (international experience suggests that this level is easily achievable).
   - Compliance levels by 2018 are: 50% full compliance; 40% minor non-compliance; 10% major non-compliance

E. Scenario 2 – represents efficiency improvement of non-CHS systems as a result of the GEF project
   - From 2015, 5% of all existing non-CHS systems (i.e. those that have reached the end of their assumed 20 year life) are annually replaced by a 20% more efficient system
   - From 2015, 5% of these higher efficiency non-CHS systems would also be fitted each year in new buildings

F. Scenario 3 – represents efficiency improvement of CHS systems as a result of the GEF project
   - From 2015, 5% of all existing CHS systems are annually replaced by a 40% more efficient system; the 5% refurbishment rate has been assumed by the modellers, given the relatively low number of this system type.
   - From 2015, 5% of these higher efficiency CHS systems would also be fitted each year in new buildings

G. Scenario 4 – represents the installation of SHW systems to existing buildings as a result of the GEF project
   - From 2015 SHW systems are retrofitted to all existing buildings at a rate of 2% per year, saving 80% of water heating energy use
   - From 2015, 2% of SHW systems would also be fitted each year in new buildings

H. Combined Impact

- Scenario 1B was used when combining the impacts of the outcomes above.
- All dwellings which have SWHs fitted will have their heating system refitted.

III. Results

CASE\Year	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023	2024	Cumulative
	Energy Impacts Relative to the Base Case (TJ/year)											
No policy case	13426.0	23257.9	31570.6	38771.4	45123.0	50804.7	55944.4	60636.5	64952.9	68949.3	72669.8	512680.3
Scenario 1A impact	57822.0	82576.6	107331.2	132085.8	156840.4	181595.0	206349.6	231104.2	255858.8	280613.4	305368.0	1939723.0
Scenario 1B impact	62006.0	88551.4	115096.8	141642.2	168187.6	194733.0	221278.4	247823.8	274369.2	300914.6	327460.0	2080057.0
Scenario 2 impact				8138.7	54142.4	92046.0	122585.8	146498.3	164519.7	177386.5	185835.0	951152.4
Scenario 3 impact				1405.3	8660.8	14629.0	19427.0	23171.8	25980.3	27969.7	29257.0	150500.9
Scenario 4 impact				5177.9	34276.2	58248.8	77561.7	92680.8	104072.1	112201.7	117535.4	601754.6
Combined impact	43119.0	108202.2	170504.4	230025.8	286766.4	340726.0	391904.8	440302.6	485919.6	528755.8	568811.0	3551918.6
	CO2 Reductions Relative to the Base Case (Mton/year)											
No policy case	-1.137	-1.970	-2.674	-3.284	-3.822	-2.983	-3.285	-3.560	-3.814	-4.048	-3.748	-33.2
Scenario 1A impact	3.184	4.547	5.910	7.274	8.637	10.000	11.363	12.726	14.090	15.453	17.000	107.0
Scenario 1B impact	3.503	5.002	6.502	8.001	9.501	11.000	12.500	13.999	15.499	16.998	18.000	117.0
Scenario 2 impact	0.000	0.000	0.000	0.442	2.941	5.000	6.659	7.958	8.937	9.636	10.000	51.6
Scenario 3 impact	0.000	0.000	0.000	0.096	0.592	1.000	1.328	1.584	1.776	1.912	2.000	10.3
Scenario 4 impact	0.000	0.000	0.000	0.267	1.765	3.000	3.995	4.773	5.360	5.779	6.000	30.9
Combined impact	2.325	5.835	9.195	12.405	15.465	18.375	21.135	23.745	26.205	28.515	30.868	191.7

Bottom-up indirect impacts

It is expected that the market transformation activities carried out by the project will result in a nationwide implementation of retrofit measures. During the 10 year influence period following project completion, it is assumed that the pilot installations will be replicated by a factor of 20, resulting in a bottom-up indirect GHG reduction of 20 $MtCO_2$.

Top-down indirect impacts

For the estimation of indirect impacts using the top-down approach, the indirect impacts (combined impacts) need to be scaled with a causality factor. Given that most of the indirect impact is due to incremental activities implemented with this project, a Level 4 causality factor should be applied. ("Level 4 = "The GEF contribution is dominating, but some of this reduction can be attributed to the baseline," GEF causality factor" = 80%).

Results overview

This leads to the following estimation of project impacts:

- Direct impacts amount to 1.0 $MtCO_2$
- Bottom-up indirect impacts amount to 20 $MtCO_2$.
- Top-down indirect impacts amount to 80% x 192 MtCO2 = 153 $MtCO_2$
- The GEF grant amounts to $4 million
- **The cost-effectiveness of this project is $4.0/tCO$_2$**
- The cost-effectiveness taking into account indirect impacts also is $ 0.03/tCO_2

Annex H: Inception Phase workplan

Draft Inception Phase To Do List

Activity item	Responsible	Jul	August 2016				September 2016				October 2016			
Signing of the Project Document	***IP - UNDP***													
Recruitment of Intl. CTA	***UNDP***													
- finalize the ToR in consultation with IP and BRH														
- put advertisement on UNDP Jobs														
- prepare long/short list														
- hold interview session														
- finalize recruitment and issue contract														
Official nomination of NPD to MFA and UNDP	***IP***													
Recruitment of National Core Team Members	***IP***													
- establish a joint committee consisting of UNDP, MFA and IP to be engaged with recruitment processes														
- decide on key posts to be filled during the Inception Phase														
- finalize ToRs in close consultation with UNDP and BRH														
- put advertisement on UNDP Iran website														
- prepare long/short lists														
- hold interview sessions														
- finalize recruitments and issue contracts														
- hold briefing meetings with UNDP for project core team														

Establish and equip the Project Office	***IP***													
- formally establish the Project Office														
- procure equipment for project office														
Prepare Inception Report	***IP***													
- prepare and finalize Table of Content in consultation with CTA, UNDP CO and BRH														
- discuss and finalize the project roadmap														
- elaborate on project components														
- revise project outputs														
- revise project RRF														
- revise ToRs for project staff and consultants														
- draft Inception Report														
Hold Inception Workshop	***IP***													
- start organizing the event														
- hold the Workshop														
- introduce NIM procedures and GEF to project core team														
- introduce project to key stakeholders														
- review and approve Inception Report by project key stakeholders														
Hold the first meeting of PSC	***IP***													
- approve the ToR and composition for PSC														
- approve and finalize the Inception Report														