Promoting Low Cost Energy Efficient Wooden Buildings in Turkey

GEF Secretariat Review for Full Sized Project

Basic Information

GEF ID
10090

Countries
Turkey

Project Title
Promoting Low Cost Energy Efficient Wooden Buildings in Turkey

GEF Agency(ies)
UNDP

Agency ID
UNDP: 5673

GEF Focal Area(s)
Climate Change

Program Manager
Ming Yang

Part I – Project Information

Focal area elements

1. Is the project/program aligned with the relevant GEF focal area elements in Table A, as defined by the GEF 7 Programming Directions?

Secretariat Comment at PIF/Work Program Inclusion

MY 10/15/2018

Yes, it is aligned with GEF7 CCM window of accelerating energy efficiency.

Agency Response

Indicative project/program description summary

2. Are the components in Table B and as described in the PIF sound, appropriate, and sufficiently clear to achieve the project/program objectives and the core indicators?

Secretariat Comment at PIF/Work Program Inclusion

MY 10/15/2018

Not at this time.

1. Please consider developing new codes and standards for energy efficient wooden buildings for the country;

2. Please consider updating the national sustainable forest management policy that will fit the forthcoming massive timber demand due to the transformational change from constructions of concrete buildings to wooden buildings using CLT technologies. As a result, the demand of timber may cause tree cutting more than the country's cap. Please design and describe a scenario and relevant government policy to deal with the situation. Please make sure that the massive timber demand due to wooden house construction will not cause any deforestation in Turkey and any other countries in the World.

3. Please set quantitative targets for workshops and trainings. This is to make evaluation of the project easier. For example, For 1. Please consider developing new codes and standards for energy efficient wooden buildings for the country; Component 3, please indicate the number of companies that will get benefits of CLT for new housing constructions.

4. In Table B and Component descriptions in paragraphs 15, 16 and 17 on pages 13 and 14, please (1) make it clear that the mechanisms will be put in place to ensure that persons/individuals are trained adequately to implement this new method of building construction. Consider updating of curriculums/training programs for engineers, construction workers, architects etc.; (2) develop a plan that will facilitate a certification system for companies that may potentially be involved in using wood for construction; (3) ensure this project will become complementary with other RE and EE aspects of the construction sector,

MY 11/6/2018

Yes. Comments have been addressed.

But in the PPG stage, please (1) develop a plan that will facilitate a certification system for companies in Turkey in using wood for construction; and (2) identify and develop new codes and standards for energy efficient wooden buildings for the country (this is essential for the CEO ER).

Agency Response

1. This is indeed being undertaken. Turkey's building energy regulation focuses on thermal resistance. The National Standard of Thermal Insulation Requirements for Buildings (TS 825) was first issued in 1999 and became mandatory in June 2000. This standard has been revised several times subsequently, latest version of which was published in 2013 and the latest standard moves in the direction of the EU's Energy Performance of Buildings Directive 2010/30/EU. The latest version of the standard from 2013 will be used as the baseline for this project. Updates and improvements will be made as part of component 1 on policy, legislative, and regulatory support. Please see relevant addition in PIF in Paragraph 15.

2. Please see paragraph 23 in the PIF with additional explanations. This work is indeed being done and is ongoing with the support of UNDP and the GEF. UNDP Turkey is leading the "Integrated approach to management of forests in Turkey, with demonstration in high conservation value forests in the Mediterranean region Project" supported by GEF. This ongoing project has successfully created sustainable forest management implementation modalities that are in line with international Sustainable Forest Management Criteria and Indicators (SFM C/I). The Project revised Turkey's SFM C/I with a strong stakeholder participation and General Directorate of Forestry (GDF) has taken into account of ecosystem-based management of Turkish forests that will guarantee sustainable management and harvest of Turkey's forests.

3. Please see additions made in paragraphs 15, 16, 17. Under component 1 it is envisaged that there will be a minimum of three workshops on policies, regulations, and legislation related to wooden buildings. Under component 2, there will be at least three workshops explaining the financial support mechanism to key stakeholders once the mechanism is up and running. Under component 3, there will be at least five general awareness and capacity building workshops. This means that at least eleven workshops will be held by the project. This number will be examined and possibly revised during the PPG phase.

4. Please see paragraphs 15, 16, 17. Specific training activities are defined in the PIF. These include training activities for the sector, public institutions and even at universities. Certification approach is also added to the project content. The Turkish forest business sector NGOs, UAB and TORID will be the center of certification approach to ensure quality, ownership and sustainability.

Details defined in the PIF follow as:

As a part of this component, specific capacity building activities will be developed for the construction companies, their engineers and architects and SMEs from the wood industry sector in order to ensure best use of methods and implementation of standards. At least 4 training activities will be held targeting different players of the sector. The details of training package will be defined during the PPG phase. Moreover, the project will initiate cooperation with several Turkish universities with civil engineering departments to plan to include courses in the curriculum. The UNDP Turkey is already working with universities in Ankara and İstanbul on diversification of wood products and their use in construction sector. This baseline will be further developed to ensure the dissemination of knowledge regarding wooden buildings for the undergraduate students. Moreover, the representatives of Turkish project partners Turkish Wooden Products Importers & Industrialists Association (TORID) and National Timber

Association (UAB) will look for options to design a certification system in collaboration with construction sector NGOs to be provided to companies who are interested to invest in wooden buildings. Furthermore, UNDP and GDF will ensure best selection of 6 demo projects with several key public and private organizations during the PPG. The PPG phase will ensure the ownership of buildings by those organizations for maintenance. The key sector NGOs TORID and UAB as well as GDF and UNDP will continue supporting for maintenance services to ensure a strong demonstration and sustainability of the buildings.

Co-financing

3. Are the indicative expected amounts, sources and types of co-financing adequately documented and consistent with the requirements of the Co-Financing Policy and Guidelines, with a description on how the breakdown of co-financing was identified and meets the definition of investment mobilized?

Secretariat Comment at PIF/Work Program Inclusion

MY 10/15/2018

Not completed at this time. In-kind contribution cannot be classified as "investment mobilized". Please revise it.

MY 11/6/2018

Yes. Comments have been addressed.

Agency Response

Revision have been made in the PIF. For the in-kind contributions, investment mobilized statements were changed as “recurrent expenditures”.

GEF Resource Availability

4. Is the proposed GEF financing in Table D (including the Agency fee) in line with GEF policies and guidelines? Are they within the resources available from (mark all that apply):
Secretariat Comment at PIF/Work Program Inclusion

MY 10/15/2018

Yes.

Agency Response

The STAR allocation?

Secretariat Comment at PIF/Work Program Inclusion

MY 10/15/2018

Yes.

Agency Response

The focal area allocation?

Secretariat Comment at PIF/Work Program Inclusion

MY 10/15/2018

Yes.

Agency Response

The LDCF under the principle of equitable access

Secretariat Comment at PIF/Work Program Inclusion

MY 10/15/2018

N/A

Agency Response

The SCCF (Adaptation or Technology Transfer)?

Secretariat Comment at PIF/Work Program Inclusion

MY 10/15/2018

N/A

Agency Response

Focal area set-aside?

Secretariat Comment at PIF/Work Program Inclusion

MY 10/15/2018

N/A

Agency Response

Impact Program Incentive?

Secretariat Comment at PIF/Work Program Inclusion

MY 10/15/2018

N/A

Agency Response

Project Preparation Grant

5. Is PPG requested in Table E within the allowable cap? Has an exception (e.g. for regional projects) been sufficiently substantiated? (not applicable to PFD)

Secretariat Comment at PIF/Work Program Inclusion

MY 10/15/2018

Yes.

Agency Response

Core indicators

6. Are the identified core indicators in Table F calculated using the methodology included in the correspondent Guidelines? (GEF/C.54/11/Rev.01)
Secretariat Comment at PIF/Work Program Inclusion

MY 10/15/2018

Not completed at this time. The GHG mitigation benefits were calculated on the basis of emissions between the constructions and materials of the two kinds of houses, concrete and wooden houses. Please take into account CO2 emissions of life time operations of the two houses including heating and air conditioning, and the replacement of wooden materials for the wooden houses.

MY 11/6/2018

Yes. Comments have been addressed.

Agency Response

As per the request of the GEF Secretariat, the GHG Calculations have now been made in more detail and dividing them into GHG emission reductions from construction, GHG emission reductions during repair and retrofitting and GHG emission reductions from cooling and heating. Energy Use and CO2 emissions are saved during three phases of a building's lifetime which includes (i) during construction (known as "cradle to gate"), (ii) during repair and retrofitting, and (iii) during heating and cooling during the lifetime of the house.

Estimates using CORRIM data show that during construction, it takes approximately 60MJ fossil fuel/m2 for wooden walls which saves about 12 kg CO2/m2. Each demonstration wooden home is estimated as having 500m2 of floor space and each wooden dormitory is estimated as having 6,000 m2 of floor space which works out to a total of 14,000 m2/floor space for 4 large wooden homes and 2 wooden dormitories. Based on an estimated savings of 288 Kg CO2/m2 of buildings this works out to some 4,032 tons of CO2 saved during construction of six demonstration project wooden buildings.

For more detailed see paragraphs 22, 23, and 24 of the PIF.

Project/Program taxonomy

7. Is the project/ program properly tagged with the appropriate keywords as requested in Table G?

Secretariat Comment at PIF/Work Program Inclusion

MY 10/15/2018

Yes.

Agency Response

We also included 'Climate Change Adaptation 0' in Rio Markers.

Part II – Project Justification

1. Has the project/program described the global environmental / adaptation problems, including the root causes and barriers that need to be addressed?

Secretariat Comment at PIF/Work Program Inclusion

MY 10/15/2018

Yes.

Agency Response

2. Is the baseline scenario or any associated baseline projects appropriately described?

Secretariat Comment at PIF/Work Program Inclusion

MY 10/15/2018

Not at this time.

The PIF does not include any information on cross laminated timber industry in Turkey. Please undertake research and provide the baseline information on the industry.

MY 11/6/2018

Yes. Comments have been addressed.

Agency Response

Additions have been made in paragraph 10 in the PIF about cross laminated timber (CLT) industry in Turkey. Detailed information on CLT and other massive wood products are explained in detail with barriers, constraints and competition with cement sector. The addition made in the PIF follows as:

The Turkish wood industry made several attempts to produce wooden materials that can be used in construction sectors. One of those materials is Glue-Laminated Timber (GLT) which is made by several layers of lumber which are attached by a durable type of adhesives. With this technology, a strong material that can be used in construction sector can be generated by small pieces of wood. GLT is used as post and beam in the building sector with various shapes including curved ones.

Production of GLT in Turkey was initiated in early nineties by a private company called Şişmanoğulları Lamine that followed by use of GLT in some buildings in İzmir region by a company called Vedat Tokyay. Later GLT was used in several other occasions including construction of small outside facilities of several touristic hotels. However, use of GLT never passed the threshold to be an industrial product. In addition to the GLT, the idea of using Cross-Laminated Timber (CLT) like in several other countries has been owned by several Turkish companies. CLT is different in terms of production of the material through putting several layers of lumber on top of each other with each layer to be perpendicular to adjacent layer and glued to each other to produce a panel to be used in buildings.

Up to now, most of the CLT used in a number of implementations were exported from other countries. Local CLT production is currently realized by a company called Naswood based in Antalya. However, due to the lack of demand, their production line is working with 30% capacity mainly providing CLT for companies' own need. The facility produces CLT with 14m length and 3.7m height with a thickness of 6-40cm. Currently, Naswood's production capacity is

enough to match the construction of several buildings at the same time. The market price for CLT produced by the company is almost equal to the European market and also equal to the price for steel in turkey. However, price levels are 20-30% more expensive than the cement.

Cement is the main element of the giant Turkish construction company that is available to all with reasonable market prices with an 80-years of history. With the current demand to CLT, it is not a competitor for the well-established cement sector. Having mis-information on the properties of wood to be used in construction, such as its weakness or vulnerability to fires, creates barriers for the wooden products.

In addition, the academic curriculum of Turkey within the universities in terms of civil engineering and architecture departments doesn't include wooden buildings as one of the main products of construction. Therefore, the graduates are not familiar with the benefits of the wood in construction sector. The project aims to identify those knowledge.

3. Does the proposed alternative scenario describe the expected outcomes and components of the project/program?

Secretariat Comment at PIF/Work Program Inclusion

MY 10/15/2018

Yes.

Agency Response

4. Is the project/program aligned with focal area and/or Impact Program strategies?

Secretariat Comment at PIF/Work Program Inclusion

MY 10/15/2018

Yes. It is aligned with the CCM energy efficiency program window.

Agency Response

5. Is the incremental / additional cost reasoning properly described as per the Guidelines provided in GEF/C.31/12?

Secretariat Comment at PIF/Work Program Inclusion

MY 10/15/2018

Yes.

Agency Response

6. Are the project's/program's indicative targeted contributions to global environmental benefits (measured through core indicators) reasonable and achievable? Or for adaptation benefits?

Secretariat Comment at PIF/Work Program Inclusion

MY 10/15/2018

Not completed at this time. Please take into lifetime operations between the concrete housing and wooden housing in calculating CO2 emission reductions.

MY 11/6/2018

Yes. Comments have been addressed.

Agency Response

As per the request of the GEF Secretariat, the GHG Calculations have now been made in more detail and dividing them into GHG emission reductions from construction, GHG emission reductions during repair and retrofitting and GHG emission reductions from cooling and heating. Energy Use and CO2 emissions are saved during three phases of a building's lifetime which includes (i) during construction (known as "cradle to gate"), (ii) during repair and retrofitting, and (iii) during heating and cooling during the lifetime of the house.

Estimates using CORRIM data show that during construction it takes approximately 60MJ fossil fuel/m2 for wooden walls which saves about 12 kg CO2/m2. Each demonstration wooden home is estimated as having 500m2 of floor space and each wooden dormitory is estimated as having 6,000 m2 of floor space which works out to a total of 14,000 m2/floor space for 4 large wooden homes and 2 wooden dormitories. Based on an estimated savings of 288 Kg CO2/m2 of buildings this works out to some 4,032 tons of CO2 saved during construction of six demonstration project wooden buildings.

For more detailed see paragraphs 22, 23, and 24 of the PIF.

7. Is there potential for innovation, sustainability and scaling up in this project?

Secretariat Comment at PIF/Work Program Inclusion

MY 10/15/2018

Not completed. Please write a para on sustainability, namely what will happen to the demonstration projects when the GEF project implementation period is over.

MY 11/6/2018

Yes. Comments have been addressed.

Agency Response

Please see Paragraph 16 and the section 7 on innovation, sustainability and potential for scaling up for the additions. UNDP and GDF will ensure best selection of 6 demo projects with several key public and private organizations during the PPG. The PPG phase will ensure the ownership of buildings by those organizations for maintenance. The key sector NGOs TORID and UAB as well as GDF and UNDP will continue supporting for maintenance services to ensure a strong demonstration and sustainability of the buildings.

Project/Program Map and Coordinates

Is there a preliminary geo-reference to the project's/program's intended location?

Secretariat Comment at PIF/Work Program Inclusion

MY 10/15/2018

Not yet. In Component 2 on pages 2, 3, 13 and 14, please indicate where the demonstration sub-project (investment) will take place.

MY 11/6/2018

Yes. Comments have been addressed.

But in the CEO ER stage, please indicate the locations of the demo projects.

Agency Response

The exact location of the demonstration projects will be identified during the PPG phase based on the co-financing assured by the key stakeholders. This is identified in the paragraph 16 of the PIF.

Stakeholders

Does the PIF/PFD include indicative information on Stakeholders engagement to date? If not, is the justification provided appropriate? Does the PIF/PFD include information about the proposed means of future engagement?
Secretariat Comment at PIF/Work Program Inclusion

MY 10/15/2018

Yes, it is shown on pages 18-19.

Agency Response

Gender Equality and Women's Empowerment

Is the articulation of gender context and indicative information on the importance and need to promote gender equality and the empowerment of women, adequate?
Secretariat Comment at PIF/Work Program Inclusion

MY 10/15/2018

Yes, it is shown on page 21.

Agency Response

Private Sector Engagement

Is the case made for private sector engagement consistent with the proposed approach?

Secretariat Comment at PIF/Work Program Inclusion

MY 10/15/2018

Yes, it is shown on page 21.

Agency Response

Risks

Does the project/program consider potential major risks, including the consequences of climate change, that might prevent the project objectives from being achieved or may be resulting from project/program implementation, and propose measures that address these risks to be further developed during the project design?
Secretariat Comment at PIF/Work Program Inclusion

MY 10/15/2018

Yes. It is shown on pages 21-22.

Agency Response

Coordination

Is the institutional arrangement for project/program coordination including management, monitoring and evaluation outlined? Is there a description of possible coordination with relevant GEF-financed projects/programs and other bilateral/multilateral initiatives in the project/program area?

Secretariat Comment at PIF/Work Program Inclusion

MY 10/15/2018

Yes. It is shown on page 23.

Agency Response

Consistency with National Priorities

Has the project/program cited alignment with any of the recipient country's national strategies and plans or reports and assessments under relevant conventions?

Secretariat Comment at PIF/Work Program Inclusion

MY 10/15/2018

Yes. It is shown on pages 23-24.

Agency Response

Knowledge Management

Is the proposed "knowledge management (KM) approach" in line with GEF requirements to foster learning and sharing from relevant projects/programs, initiatives and evaluations; and contribute to the project's/program's overall impact and sustainability?

Secretariat Comment at PIF/Work Program Inclusion

MY 10/15/2018

Yes. It is shown on page 24.

Agency Response

Part III – Country Endorsements

Has the project/program been endorsed by the country's GEF Operational Focal Point and has the name and position been checked against the GEF data base?

Secretariat Comment at PIF/Work Program Inclusion

MY 10/15/2018

Yes.

Agency Response

GEFSEC DECISION

RECOMMENDATION

Is the PIF/PFD recommended for technical clearance? Is the PPG (if requested) being recommended for clearance?

Secretariat Comment at PIF/Work Program Inclusion

MY 11/20/2018

Yes, all comments have been addressed. The project has been technically cleared. The PM recommends PIF clearance.

CEO Cover memo:

Objective: to promote and replicate the use of innovative wood-based technologies as low carbon construction materials in Turkey.

Rational: In its Nationally Determined Contributions to the UNFCCC (NDCs), the government of Turkey has decided to use energy efficiency (EE) improvement, including EE buildings, as a means to achieve the climate mitigation target. In 2014, it is estimated that there was 151,016,151m2 of new buildings constructed in all of Turkey (over 50,000 new buildings) of which only 289,681m2 (0.19%) used wooden frames and wooden materials. The greenhouse gas savings from this construction in the baseline is estimated as 289,681 x 0.288 tons $CO2/m^2$ = 83,428 tons CO2e reduced in 2014 due to the fact that 0.19% of all new buildings in Turkey were constructed from wood.

However, with the support of this project it is estimated that by the year 2026 it is ambitious but possible that an additional 1% of all new buildings in Turkey will be constructed from wood (approximately 1.51 million m2) going from currently approximately 0.19% to 1.19% of total building stock in 2026 meaning that the greenhouse gas emissions from construction will be

reduced by 1,510,161 x 0.288 tons CO_2/m^2 = 434,926 tons CO_2e per annum which includes GHG emission reductions not only during construction (cradle to gate) but also heating and cooling. If by 2026, the percentage of buildings constructed in Turkey using wood products reached around 5 percent, then the overall annual CO_2e savings would be approximately 2.2 million tons of CO_2e per annum. This project will facilitate the target of the CO_2 emission reductions from buildings.

Innovation: The innovativeness of the project lies in the fact that it is promoting a new technology called cross laminated timber which is taking wood buildings to the next level in terms of their suitability and durability as a construction material. The cross lamination provides dimensional stability, strength and rigidity which makes it a visible and viable alternative to concrete, masonry, and steel in many building applications. It can be used for an entire building or it can be used for part of a building. The project is innovative because it is supporting and promoting a technology, CLT, which has not been proven in Turkey and where there is significant potential for scaling up and replication.

Sustainability and Scaling up: The UNDP will ensure best selection of 6 demo projects with several key public and private organizations during the PPG phase. The PPG phase will identify key partners for the construction of the 6 new wooden buildings and aim to ensure the ownership of buildings by those organizations for maintenance. The key sector NGOs and the UNDP will continue supporting for maintenance services to ensure a strong demonstration and sustainability of the buildings. Besides, the potential for scaling up the results of this project is enormous given that so little wood is currently used in construction in Turkey. If the target is reached of an additional 1% of all new construction in Turkey each year coming from wood products then there will be significant CO_2 savings, estimated at around 434,926 tons of CO_2e per annum. With the assistance of this project in overcoming legal, regulatory, financial, and awareness barriers it is estimated that the potential for CO_2 savings from scaling up will be even more significant reaching at least 1 million tons of CO_2e per annum if eventually around 5% of all new construction in Turkey comes from wood products.

Co-financing ($34 million) comes from (1) the government, with $27 million grant and $5.2 million in-kind: (2) CSOs with $1.4 million in-kind, and (3) the agency with $80,000 grant and $320,000 in-kind.

This project has targeted to mitigate 434,926 tons of CO_2 equivalent in its lifetime.

ADDITIONAL COMMENTS

Additional recommendations to be considered by Agency at the time of CEO endorsement/approval.

Secretariat Comment at PIF/Work Program Inclusion

11/6/2018 MY

In the CEO ER stage, please (1) show a plan that will facilitate a certification system for companies in Turkey in using wood for construction; (2) add project activities that will help develop new codes and standards for energy efficient wooden buildings for the country (this is essential for the CEO ER); (3) indicate the locations of the demo projects; (4) on page of the PIF, please revise the GHG emission target from 434,926 million tons to 434,926 tons; (5) for Knowledge Management, please full address the following issues:

Overview of existing lessons and best practice that inform project concept	Plans to learn from relevant projects, programs, initiatives & evaluations	Proposed processes to capture, assess and document info, lessons, best practice & expertise generated during implementation	Proposed knowledge outputs to be produced and shared with stakeholders (at both program and project levels if a PFD)	Discussion on how knowledge and learning will contribute to overall project/program impact and sustainability	Plans for strategic communications

Review Dates

	PIF Review	Agency Response
First Review		
Additional Review (as necessary)		
Additional Review (as necessary)		
Additional Review (as necessary)		
Additional Review (as necessary)		