



# REQUEST FOR CEO ENDORSEMENT

**PROJECT TYPE: Full-sized Project**

**TYPE OF TRUST FUND: GEF Trust Fund**

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## PART I: PROJECT INFORMATION

Project Title: Sustainable Energy Financing Mechanism for Solar Photovoltaic Systems in Forest Villages in Turkey			
Country(ies):	Turkey	GEF Project ID: <sup>1</sup>	5732
GEF Agency(ies):	UNDP (select)	GEF Agency Project ID:	5323
Other Executing Partner(s):	Ministry of Forestry and Water Affairs, General Directorate of Forestry (GDF), Forest Village Relations Department (ORKOY)	Submission Date:	November 30, 2015
GEF Focal Area (s):	Climate Change	Project Duration (Months)	48
Name of Parent Program (if applicable):		Project Agency Fee (\$):	359,100
	<ul style="list-style-type: none"> <li>➤ For SFM/REDD+ <input type="checkbox"/></li> <li>➤ For SGP <input type="checkbox"/></li> <li>➤ For PPP <input type="checkbox"/></li> </ul>		

### A. FOCAL AREA STRATEGY FRAMEWORK<sup>2</sup>

Focal Area Objectives	Expected FA Outcomes	Expected FA Outputs	Trust Fund	Grant Amount (\$)	Co-financing (\$)
CCM-3 - Renewable Energy	<p>Outcome 3.1 – Favourable policy and regulatory environment created for renewable energy investments</p> <p>Indicator 3.1: - Extent to which renewable energy policies and regulations are adopted and enforced (score of 1 to 5)</p> <p>Outcome 3.2 – Investment in Renewable Energy Technologies increased</p> <p>Indicator 3.2: - Volume of Investment Mobilized</p>	<p>Output 3.1: Renewable energy policy and regulation in place</p> <p>Output 3.2: Renewable energy capacity installed</p> <p>Output 3.3: Electricity and heat produced from renewable sources</p>	GEF TF	\$3,780,000	\$52,500,000

<sup>1</sup> Project ID number will be assigned by GEFSEC.

<sup>2</sup> Refer to the [Focal Area Results Framework and LDCF/SCCF Framework](#) when completing Table A.

<b>Total project costs</b>	3,780,000	52,500,000
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## B. PROJECT FRAMEWORK

### Project Objective:

This project will assist Turkey with the promotion and financing of on-grid village cooperative solar PV in forest villages with the goal of having at least 30 MW of installed capacity of grid-connected, cooperative solar PV in forest villages) by the end of the project, thereby leading to significant greenhouse gas emission reductions.

Project Component	Grant Type	Expected Outcomes	Expected Outputs	Trust Fund	Grant Amount (\$)	Confirmed Cofinancing (\$)
Policy & Institutional Framework for supporting Sustainable energy financing mechanism for solar power in forest villages	TA	Outcome 1.1 Enhanced enabling policy and environment, within which ORKOY's sustainable energy financing mechanism continues to operate beyond the lifetime of the project	<ul style="list-style-type: none"> <li>•Output 1.1 – Evaluation and selection of public-private business models (ORKOY, solar PV installers, utilities, domestic banks) for provision of affordable, grid-connected residential solar PV to forest villagers, using an individual household and/or cooperative model.</li> <li>•Output 1.2 - Terms of Reference for ORKOY's Credit Programme are revised, agreed, published and disseminated</li> <li>•Output 1.3 Sustainable energy Financing unit established within ORKOY with dedicated full time staff</li> <li>•Output 1.4 – Model contract for ORKOY soft loan developed and utilized</li> <li>•Output 1.5 – National Framework designed and operationalized to use Turkey's feed-In-Tariff scheme for the purpose of residential solar PV for forest villagers.</li> </ul>	GEF TF	755,100	750,000

			<ul style="list-style-type: none"> <li>•Output 1.6 – Technical report on grid capacity and requirements to enable feed-in of grid-connected PV and to define technical information for the national grid code.</li> <li>•Output 1.7 – Methodology for innovative approach (e.g. net metering) is developed, published and disseminated</li> </ul>			
Solar PV demonstration Projects	TA INV	Outcome 2.1 Sustainable Energy Financing Mechanism of ORKOY successfully finances four solar PV demonstration projects (each up to 100 kW in total) in forest villages, using either individual household and/or cooperative models	<p>Output 2.1 Business plans &amp; feasibility studies prepared for a total of four demonstration projects in forest villages up to 400kW</p> <ul style="list-style-type: none"> <li>• Output 2.2 – Four demonstration projects successfully implemented in forest villages in 4 different regions.</li> <li>• Output 2.3 – Case Studies Prepared on each of the Demonstration Projects</li> <li>• Output 2.4 – Short video documentary prepared on the demonstration projects</li> </ul>	GEF TF	<p>TA: \$591,009</p> <p>Inv: \$650,000</p>	<p>TA: \$100,000</p> <p>Inv: \$750,000</p>
Replication and scaling up – Enhancement of the sustainable energy financing mechanism	TA	Outcome 3.1: Sustainable Energy Financing Mechanism of ORKOY successfully provides soft loans to contribute to the deployment of at least 30MW of solar PV during project lifetime Outcome 3.2: Sustainable Energy Financing	<ul style="list-style-type: none"> <li>•Output 3.1 National Awareness Raising Programme for ORKOY Sustainable Energy Financing Mechanism addressing forest village end-users and cooperatives</li> <li>•Output 3.2 – Solar PV Training Manual for actors in solar PV value chain (ORKOY officials, installers, utilities) on how to develop, finance, and</li> </ul>	GEF TF	<p>TA: \$887,650</p> <p>INV: \$746,241</p>	<p>TA: \$2,000,000</p> <p>INV: \$48,575,000</p>

		<p>Mechanism of ORKOY has in place systems for M&amp;E, quality standards, and certification systems and training programmes</p>	<p>implement solar PV projects is prepared, published and disseminated widely</p> <ul style="list-style-type: none"> <li>•Output 3.3 – Twenty National workshops held to promote the solar PV training manual targeting solar PV value chain (ORKOY officials, installers, utilities)</li> <li>•Output 3.4 – MRV system and indicators designed and implemented to reliable track energy consumption</li> <li>•Output 3.5 – Quality standards and certification scheme designed and implemented for solar PV hardware and for skilled technicians</li> <li>•Output 3.6 – Workshops with domestic and international banks to consult, build familiarity and integrate their lending to solar PV with ORKOY</li> <li>• Output 3.7 – Project Website – Practical Guide to Investing in Solar PV in Turkey.</li> <li>•Output 3.8. – Programme of Activities (PoA) for voluntary carbon market for forest villages solar PV project</li> <li>•Output 3.9. - 30 MW of solar projects successfully implemented</li> </ul>				
			Subtotal			3,630,000	52,175,000

Project management Cost (PMC) <sup>3</sup>	GEF TF	150,000	325,000
<b>Total project costs</b>		<b>3,780,000</b>	<b>52,500,000</b>

**C. SOURCES OF CONFIRMED COFINANCING FOR THE PROJECT BY SOURCE AND BY NAME (\$)**

Please include letters confirming cofinancing for the project with this form

Sources of Co-financing	Name of Co-financier (source)	Type of Cofinancing	Cofinancing Amount (\$)
National Government	ORKOY	In-kind	2,675,000
National Government	ORKOY	Cash	45,000,000
GEF Agency	UNDP	In-kind	100,000
GEF Agency	UNDP	Cash	100,000
Others	GUNDER	In-kind	125,000
Private Sector	PI ENERJI	In-kind	1,500,000
Private Sector	SOLAR TURK ENERJI	In-kind	1,500,000
Private Sector	ODUL ENERJI	In-kind	1,500,000
<b>Total Co-financing</b>			<b>52,500,000</b>

**D. TRUST FUND RESOURCES REQUESTED BY AGENCY, FOCAL AREA AND COUNTRY<sup>1</sup>**

GEF Agency	Type of Trust Fund	Focal Area	Country Name/ Global	(in \$)		
				Grant Amount (a)	Agency Fee (b) <sup>2</sup>	Total c=a+b
UNDP	GEF TF	Climate Change	Turkey	3 780 000	359 100	4 139 100
<b>Total Grant Resources</b>				<b>3 780 000</b>	<b>359 100</b>	<b>4 139 100</b>

<sup>1</sup> In case of a single focal area, single country, single GEF Agency project, and single trust fund project, no need to provide information for this table. PMC amount from Table B should be included proportionately to the focal area amount in this table.

<sup>2</sup> Indicate fees related to this project.

**F. CONSULTANTS WORKING FOR TECHNICAL ASSISTANCE COMPONENTS:**

Component	Grant Amount (\$)	Cofinancing (\$)	Project Total (\$)
International Consultants	358,750	50,000	408,750
National/Local Consultants	382,000	0	382,000

**G. DOES THE PROJECT INCLUDE A “NON-GRANT” INSTRUMENT? No**

(If non-grant instruments are used, provide in Annex D an indicative calendar of expected reflows to your Agency and to the GEF/LDCF/SCCF/NPIF Trust Fund).

**PART II: PROJECT JUSTIFICATION**

**A. DESCRIBE ANY CHANGES IN ALIGNMENT WITH THE PROJECT DESIGN OF THE ORIGINAL PIF<sup>4</sup>**

<sup>3</sup> PMC should be charged proportionately to focal areas based on focal area project grant amount in Table D below.

<sup>4</sup> For questions A.1 –A.7 in Part II, if there are no changes since PIF and if not specifically requested in the review sheet at PIF stage, then no need to respond, please enter “NA” after the respective question.

The project is generally consistent with the design in the PIF. The project has been designed in such a way as to design, develop and launch a financial support mechanism as the main tool to assist the accelerated deployment of solar pv in forest villages in Turkey. This financial support mechanism will be supported by changes to the regulatory framework (component 1) and through enhancing the effectiveness of the sustainable financial support mechanism through training and awareness raising. Generally, speaking, the project follows the same overall strategy and approach as in the PIF. However, one change has been that the amount of subsidy for investment in demonstration projects has been reduced from \$1,400,000 to \$650,000 for support for four demonstration solar PV projects in four different villages. The reason for this reduction in the budgeted GEF investment amount under component 2 is that it is understood that 100% subsidies do not provide a long-term solution towards increased deployment of solar PV in forest villages in Turkey and therefore we have decided to focus more on partial subsidies under component 3 (Amount budgeted is \$746,241) as a means towards reducing the required interest rate required for financing the first 30Mw of installed capacity. After 30Mw is installed we envisage that the market will support further deployment with soft loans only with no further subsidies required. The main difference from the PIF is therefore that in the UNDP project document and GEF RCE now has a full 100% subsidy for the first four 100kw demonstration projects under component 2 and then it has partial subsidies for further upscaling under component 3.

A.1 National strategies and plans or reports and assessments under relevant conventions, if applicable, i.e. NAPAS, NBSAPs, national communications, TNAs, NCSA, NIPs, PRSPs, NPFE, Biennial Update Reports, etc.

Title of Policy, Strategy, or Plan	Adoption Date	Description/Assessment of relevant strategy, policy or plan
National		
Turkey's Fifth National Communication Under the UNFCCC	2013	Pursuant to decision 26/CP.7 of the United Nations Framework Convention on Climate Change (UNFCCC) at the 7 <sup>th</sup> Session of the Conference of Parties held at Marrakesh, Morocco in 2001, Turkey's name was deleted from Annex II of the UNFCCC, and the Parties were invited to recognize the special circumstances of Turkey. These circumstances place Turkey in a situation different from that of other Parties included in Annex I to the UNFCCC. Subsequent to this decision Turkey became a Party to UNFCCC on 24 May 2004.
Energy Strategy 2012-2023	2012	Turkey envisages producing 30% of its electricity need from the renewables by 2023. The target to commission 20GW of wind power, 3GW of solar power and 600MW of Geothermal.
Turkish 10 <sup>th</sup> Development Plan (2014-2018)	2014	According to 10 <sup>th</sup> five year development plan; to establish a competitive energy system that makes use of local and renewable energy sources as extensively as possible
Climate Change Action Plan 2011-2023	2011	Turkey's national vision within the scope of "climate change" is to become a country fully integrating climate change-related objectives into its development policies, disseminating energy efficiency, increasing the use of clean and renewable energy resources, actively participating in the efforts for tackling climate change within its "special circumstances", and providing its citizens with a high quality of life and welfare with low-carbon intensity.
National Climate Change Strategy	2010	This strategy specifically addresses land use, agriculture and forestry strategies in its chapter on greenhouse gas (GHG) emission control. The share of renewable energy in total electricity generation shall be increased up to 30% by 2023. Electricity generation from solar energy will be supported.

National Rural Development Plan (2009-2013)	2009	Plan targets the conservation of agricultural areas, pastures and forests, including soil and water resources in areas that will be integrated into forest regimes.
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Law or Regulation Title	Adoption Date	Description/Assessment of Law/Regulation
<b>Forestry Sector</b>		
Forestry Law (6831)	1956	This Law sets forth the basic forestry legislation. The boundaries of protection forest are determined and declared to the surrounding villages. The conditions, principles, and periods of designation of such forests; and management, development, improvement and utilization principles, and decisions are decided by the Ministry of Forestry and Water Affairs.
Law on Supporting Forest Villages' Development (2924)	1983	This law sets forth the principles and process of supporting forest villages' development.
Regulation on Activities for Supporting Forest Villages' Development	2012	This regulation sets forth the details of supporting mechanism and management of ORKOY funds. Details such as credit requirements, eligible activities, eligibility criteria, co-finance thresholds, application process, interest rates, and repayment plan identified with this regulation.
Regulation on Forestation	2012	Regulation includes main procedures and principles for forestation, erosion control, pasture improvement, seed production, seedling tree nursery, and energy forestry.
<b>Energy Sector</b>		
Law on utilization of the renewable energy source for the purpose of generating electrical energy (Law 5346)	2005	The first renewable energy law to be enacted by the Turkish government. The purpose of this law is to expand the utilization of renewable energy sources for generating electric energy, to benefit from these resources in a secure, economic and qualified manner, to increase the diversification of energy resources, to reduce greenhouse gas emissions, to assess waste products, to protect the environment and to develop the related manufacturing industries for realizing these objectives.
Law on amendments on the law on utilization of the renewable energy source for the purpose of generating electrical energy (Law 6094)	2010	Renewable energy resources (RES) support mechanism is amended as follows: In the event that the mechanical and/or electro-mechanical equipment used in the production facilities of license holder entities based on the Renewable Energy Resources within the scope hereof and commissioned before 31/12/2015* are manufactured domestically; prices in Schedule-I (Feed in Tariff) will be added to the prices given in Schedule-II (Domestic product support), attached hereto, for a term of five years as from the commissioning of the production facility for electrical energy produced and given in such facilities and given to the distribution system.

		<p>Principles and procedures relating to domestic contribution for RES certified production facilities that will be commissioned after 31/12/2015* will be determined and announced by the Council of Ministers upon the Ministry's proposition.</p> <p>*This time is extended until 31.12.2020 with the official gazette published in December 5th 2013.</p>
Turkish Electricity Market Law (Law 6446)	March 2013	<p>This law is substituting the old regulation of 2001 (number 4628).</p> <p>This law envisages a waiver of license for those generation facilities based on renewable resources. This allows investors to initiate solar or wind energy projects, among others, in Turkey without needing a previous authorisation from the <i>Energy Market Regulatory Authority</i>. In order to benefit from this advantage, it is however required that the installed capacity should not exceed 1MW, which may be eventually further increased by 5MW by the respective authorities. The old legislation established on the contrary a more restrictive limit of 500Kw.</p>
Unlicensed Electric Power Production Market Regulation (Official Gazette Communique-Number 28783)	October 2013	<p>The purpose of this regulation in the electricity market; Electricity Market Law No. 6446, dated 14.03.2013 under Article 14, the point of consumption to the nearest production facilities to meet the needs of electricity consumers, facilities to meet the needs of electricity consumers supply of the country's economy to gain and ensuring the efficient use of electricity in order to reduce the amount of network losses occurring without any obligation to obtain a license to establish the company, natural or legal persons to produce electrical power to determine the procedures and principles to be applied.</p>
Regulation on Electricity Facilities Project (Official Gazette Communique-Number 29221)	30 December 2014	<p>The Regulation abolishes the Regulation on Electricity Facilities Project published in the Official Gazette on December 16, 2009 and numbered 27434. The purpose of the Regulation is to determine the procedures and principles regarding (i) the incorporation and the project approval process of the electricity facilities to ensure compliance with modern technology; (ii) the connection of the facilities to the transmission and distribution networks; (iii) the safety and protection of life, property and environment; and (iv) authorization for institutions/establishments or legal entities in charge of granting project approvals.</p>

A.2. GEF focal area and/or fund(s) strategies, eligibility criteria and priorities.



The project corresponds with the climate change mitigation strategy for GEF 5 in following objective: Climate change objective 3 – Promote investment in renewable energy technologies; Outcomes 3a – Appropriate policy, legal and regulatory frameworks adopted and enforced; Outcome 3b – Sustainable financing and delivery mechanisms established and operational and Outcome 3c – GHG emissions avoided.

*Country Eligibility:* Turkey is eligible for GEF funding.

*Fit with National Priorities & Programs:* Turkey became a Party to the UNFCCC on 24 May 2004 and an official Party to the Kyoto Protocol on 26 August 2009. Greenhouse gas emissions in Turkey have been growing at a rapid rate of between 8-10% per year in recent years. Total greenhouse gas emissions from Turkey in 1990 have doubled from about 187 million tons of CO<sub>2</sub>eq (when Land Use, Land Use Change and Forestry (LULUCF) were not taken into account, to 401 million tones of CO<sub>2</sub> eq in 2009. While sinks absorbed about 44 million tones of CO<sub>2</sub> eq of greenhouse gases emission in 1990, this value increased to about 82 million tones of CO<sub>2</sub> eq in 2009. In addition, Turkey has a high population growth rate of 1.27% which is above the OECD average and which contributes to further growth in GHG emissions in Turkey. GHG emissions per capita in Turkey increased from approximately 3.4 tonnes CO<sub>2</sub>eq per capita in 1990 to 5.2 tonnes CO<sub>2</sub>eq per capita in 2010. Taking into account its commitments under the UNFCCC and the Kyoto Protocol to reduce GHG emissions, the Turkish Government is committed towards implementing policies which reduce greenhouse gas emissions and enhance sinks and this includes promoting solar PV.

*Fit with Regional Priorities & Programs:* A forest village is defined under Turkish Forest Law # 6832 as any village that contains a forest area within their administrative borders. Forest villages are eligible for financial and technical support by the Department of Forest and Village Relations (ORKOY) within the General Directorate of Forestry under the Ministry of Forestry and Water records. According to the 2013 census, there were 7,332,000 people living in 21,549 forest villages who constitute approximately 9.6% of the total population and 35% of the total rural population of the country. Forests cover 27% of the surface area of Turkey and due to their limited land resources as well as lack of alternative sources of income, the communities living in forested areas in Turkey have traditionally been heavily dependent on utilizations from the forest areas and are among the poorest in Turkey. Due to their high level of dependency on fossil fuels and their weak capacity to finance solar PV on their own, forest villages are an excellent choice for a GEF project which aims to overcome barriers to promote greater investment in renewable energy. Greenhouse gas mitigation potential from forest villages is high given the fact that currently forest villagers are not able to easily finance and implement renewable energy electricity generation projects, despite feed-in tariffs that make investment in solar PV systems more attractive than in the past. Forest villages have been identified in the 5th National Communications to the UNFCCC of Turkey as being particularly vulnerable to the impacts of climate change, as well as having high mitigation potential and low capacity to reduce GHG emissions without additional incentives and assistance.

### A.3 The GEF Agency's comparative advantage:

UNDP has a comparative advantage when dealing with issues related to poverty alleviation. UNDP's core mandate is aimed at poverty alleviation and this project is therefore very much consistent with UNDP's core mandate. Forest villagers are almost among some of the poorest communities in Turkey and this project will therefore help with energy supply in low-income communities. Forest villages have the lowest share from the national income and such public services as health and education and therefore their capacity (on their own) to successfully deploy solar PV is going to be limited without external support. Initial estimates suggest that without this project only 3MW of additional solar PV might be installed over the next five years without this project taking place. In addition, UNDP has developed core expertise related to renewable energy projects working successfully to support the establishment and/or expansion of financial mechanisms for investment in renewable energy projects in Georgia, Zimbabwe and the Philippines.

UNDP has been working in Turkey in close partnership with the Turkish Government for more than 50 years and this includes playing a transformational role in Turkey's climate change and local development agenda through extensive support, capacity building and concrete projects including support for each of the following:

- Preparation of the first and second national communications of Turkey to the UNFCCC with the participation of a wide range of NGOs and expert institutions alongside official institutions;
- Assistance with drafting Turkey's National Climate Change Action Plans in collaboration with the Ministry of Environment and Urbanization, with the participation of a wide range of municipalities, NGOs, universities, private sector partners, and expert institutions;
- Drafting of "Registration procedures for projects that reduce Greenhouse Gas emissions" that structure the MoEU's national carbon registry system, which has accelerated Turkey's participation in global voluntary carbon markets;
- Capacity Development and Technical Support of the Government of Turkey in the international climate negotiations and with the Rio+20 conference;
- Working in collaboration with the Capital Markets Board in helping set up a national carbon exchange; - Support to the Government in developing and preparing NAMAs in Turkey;
- Managing UNDP/GEF projects related to energy-efficiency in buildings, energy-efficiency in appliances, and energy-efficiency in industry;
- Establishment of a 'National Clean Production and Eco-Efficiency Centre' and promoting industrial symbiosis in organized industrial zones, to develop sustainable methods for managing natural resources used by both the public and private sectors, in line with Turkey's development priorities
- Development of the renewable energy and energy efficiency investment and business potentials of the Southeast Anatolia Region, including development of a renewable energy and energy-efficiency strategy, and establishment of pilot renewable energy investments;
- Management of UNDP/GEF full scale project with multi-benefits on integrated forest management at the landscape level with climate change mitigation and biodiversity benefits, including a MRV system with a LULUCF database and a forestry sector NAMA

The GEF funds will be used for developing and implementing of the SEFM under ORKOY's Credit Programme, amending legal and policy frameworks; for carrying out capacity building and awareness activities necessary to enable the adoption and replication of grid-connected cooperative PV systems and the strengthening of a Solar PV market in the regions; and for installing and operating demonstration PV systems. The proposed project is requesting grant money for both technical assistance and investment; approximately 26% of GEF funds will go directly towards investment in a pilot solar PV system. The funds for the implementation of the PV systems of totally 30 MWp installed power will come from governmental (ORKOY) co- financing. The transfer of GEF funds through the financial mechanism will be conditional on the verified installation and active operation of the forest cooperatives PV systems, so that GEF funding can directly be attributed to reductions in GHG emissions. As such, GEF funds will support activities that are incremental to the existing baseline.

#### A.4. The baseline project and the problem that it seeks to address:

Turkey is located on two continents, Europe and Asia. Area of Turkey is 814.578 square kilometers. 97 per cent of the area is located on the Asian side. Marmara Sea and the Dardanelles separate Anatolia and the Eastern Thrace. Neighboring countries are Bulgaria and Greece in the west, Iraq and Syria in the south and Azerbaijan, Georgia and Iran in the east. Turkey is surrounded by four seas: Black Sea in the north, Marmara Sea in the northwest, Aegean Sea in the west and the Mediterranean in the south. The country is mountainous - Pontic Mountains follow the Black Sea and Taurus Mountains follow the Mediterranean in the south. Between them there is the Central Anatolian highland. Turkey receives most of the rainfall in the winter season when the temperature is usually below 5°C and there is scarce evaporation. Summer rainfall is very limited and could not be enough to remove water deficit resulted from increased temperature and evaporation. The Aegean and Mediterranean coasts have cool, rainy winters and hot, moderately dry summers. Annual precipitation in those areas varies from 580 to 1,300 mm, depending on location. The Black Sea coast receives the greatest amount of rainfall. The eastern part of that receives 2,200 mm annually and is the only region of Turkey that receives rainfall throughout the year. In the Eastern region of Anatolia, the elevation of mountains exceeds 2500-3000 m. Northern Black Sea Mountains and Caucasian Mountain hold the rain clouds, and therefore the area is affected by the continental climate with long and very cold winter. Minimum temperatures of -30°C to -38°C are observed in the mountainous areas in the east, and snow may lie on the ground 120 days of the year. Winters are bitterly cold with frequent, heavy snowfall. Villages in the region remain isolated for several days during winter storms.

In Turkey, villages that have some forest landscape within their official boundaries and/or nearby a forest area are designated as forest villages. The population of forest villages is around 7,332,000, representing 9.6% of the entire country's people and 35% of the rural population. This population is distributed around the country across 21,549 villages. They account for the poorest section of Turkish society with an average gross annual income in 2004 of \$400 compared with a national average of \$5,780 (GDF, 2004).

Forest villages are eligible for financial and technical support by the Forest Village Relations Department (aka ORKOY) within the General Directorate of Forestry (GDF) under the Ministry of Forestry and Water Affairs. ORKOY was founded in 1970 and has gone through several organizational changes. Until recently ORKOY was itself a General Directorate but following changes in the structure of the Ministry of Forestry and Water Affairs it has been placed under GDF as a department. ORKOY aims to contribute to the conservation of forests by supporting local communities. It has been operating a grant/loan program since 1974 targeting the forest villagers. ORKOY is running two grant/loan systems: 1 - social (non-profit projects, including grants, available only for individuals) and 2 – economic (typically 20 % grant, available for both individuals and cooperatives). Forest villages in Turkey enjoy almost 100% grid-access and access to energy and intermittent energy supply, for the most part, is not an issue. Forests cover 27% of the surface area of Turkey and due to their limited land resources as well as lack of alternative sources of income; the communities living in forest areas in Turkey have traditionally been heavily dependent on utilizations from the forest areas and are among the poorest in Turkey

Turkey has liberalized its energy sector. Now, 65% of electrical generation facilities are run by the private sector; the aim is increasing up to 100% in near future. All power distribution is now completely within private hands. In addition to having a large domestic market, Turkey is strategically well located amongst other major national energy consumers and suppliers and thus has the potential to serve as a regional energy hub. Turkey's increased leverage over the energy prices and its potential gateway status has been raised via the current and planned oil and gas pipelines, and promising findings of hydrocarbon reserves in the country, as well as the critical Turkish straits.

Renewable energy is seen as a potentially effective solution to a more cost effective, sustainable and secure development of the country. Whilst the country is resource rich for renewables, with the possible exception of hydro, these resources have been heavily under exploited to date. With the adoption of the Electricity Sector Strategy in 2009, Turkey has outlined renewable energy and energy efficiency programs that aim to provide 30% of the country's power supply by the centenary of the Turkish Republic in 2023. These goals are reiterated in Turkey's National Climate Change Action Plan of 2011. As well as focusing on renewable generation, technologies such as waste processing and electrical transmission efficiency are also cited as mechanisms to help reduce carbon emissions. The total amount of investments required to meet the energy demand in Turkey by 2023 is estimated to be around \$120bn, more than double the total amount invested over the last decade. In Turkey's tenth development plan (2014-2018), the main objectives of its energy policy are "to ensure sufficient, reliable and economical energy supplies in order to maintain economic and social development, to meet the growing energy demand, reform and liberalize the energy sector to increase productivity and efficiency and to advance transparency". Additionally, Turkey envisages specific targets for the energy sector including:

- Increasing installed power to 120,000MW
- Increasing the share of renewables to 30%
- Maximizing the use of hydropower
- Increasing wind power installed capacity to 20,000MW
- Installing power plants with 600MW of geothermal and 3,000MW of solar energy
- Extending the length of transmission lines to 60,717km
- Reaching a power distribution unit capacity of 158,460MVA
- Extending the use of smart grids
- Raising the natural gas storage capacity to 5 billion m<sup>3</sup>
- Establishing an energy stock exchange
- Commissioning nuclear power plants (two operational nuclear power plants, with a third under construction)

- Building a coal-fired power plant with a capacity of 18,500MW

The use of renewable energy resources for generating electricity was first supported with law no 5346 “Utilization of Renewable Energy Sources For the Purpose of Generating Electrical Energy” in 2005. The Feed-in Tariff or Renewable Energy Resource (RER) Support Mechanism, is a policy mechanism designed to accelerate investment in renewable energy technologies. It achieves this by making use of medium-term agreements and pricing tied to costs of production for renewable energy generators. By offering medium-term contracts and guaranteed pricing, producers are sheltered from some of the inherent risks in renewable energy production, thus allowing for more diversity in energy technologies. According to legislation, any subscriber may install a renewable energy based generation facility such as a solar system after approval of regional distribution company, giving them the opportunity to generate their own electricity and reduce the costs of their imported electricity. Subscribers also have the right to sell surplus energy onto the grid. The primary legislative framework for unlicensed electricity generation is the Electricity Market Law (Law No 6446), which has been in force since March 2013. According to Article 14 of this law, all electricity subscribers have the right to generate their own electricity without having the requirement to obtain a license or establish a company, although a lengthy approval process is still required. For plants subject to the Renewable Energy Resource (RER) Support Mechanism, prices are applied to license holders for 10 years. These prices are also valid for unlicensed RER in order to sell the surplus energy. The Main FiT is banded according to method of generation, and is fixed in USD for a period of 10 years.

Renewables projects can be approved as either licensed or unlicensed. Following modifications to the new electricity market law on 30 March 2013 (Law no: 6446), the capacity limit for individual unlicensed solar projects has been increased from 500kW to 1000kW. Following the announcement of these new regulations on 2nd October 2013, there has been an increase in demand for unlicensed solar power plant approvals in Turkey: As of 11th November 2014, submitted applications amounted to a combined capacity of 532,068kW. 132,768kW of these have been approved by TEDAS (Turkish Electricity Distribution Company). Of this, just 24,345kW has received a provisional acceptance certificate. The total amount of approved solar power has so far reached 2,000MW according to TEIAS (Turkish Electricity Transportation Company) and they cite this as evidence that the 3,000MW target will be reached much earlier than the 2023 target. However, to put this 3GW target into context, it appears to be remarkably unambitious for such a large country of high average solar irradiance when compared for example to Germany, which has half the land area and 30% less irradiance/m<sup>2</sup>, which has recently been installing 7.5GW per year, and has so far reached 38GW total solar capacity.

According to the new Turkish Electricity Market Law 6446, which entered into force in March 2013, and the Electricity Market License Regulation that came into force in November 2013, generating electricity in the Turkish market requires an electricity generation license to be obtained from the Energy Market Regulatory Authority (EMRA). With respect to solar schemes, a license is required if the capacity is greater than 1MW. Unlike applications for electricity generation from conventional sources, such as natural gas and coal, the RES Law mandates that license applications concerning solar generation facilities can only be made on a specific date, to be determined by EMRA. In addition, the current legislation introduces limits on established capacity and requirements in relation to the land. EMRA has brought two limitations with respect to capacity of licensed solar plants. Under the Electricity Market License Regulation, the established capacity of a single solar power plant cannot exceed 50MW. Moreover, the aggregate established capacity of solar energy based generation facilities to be connected to the grid is limited through time. An attractive benefit of the licensed solar power generation process is the provision of land to investors at a special discount of 85%. To be able to manage the provision phase properly, a limit has been defined with respect to the land area of the plant. According to this limit, a maximum 20,000 m<sup>2</sup> of land can be utilized per MW. Applications that request the establishment of a solar power plant on agricultural land will be automatically rejected.

Even so called ‘unlicensed’, these installations require a lengthy bureaucratic approval processes, which is a significant bottleneck for the sector. The total length of the permitting procedure can vary between 9 – 12 months. The secondary legislative framework for unlicensed electricity generation from renewable sources is the “Regulation on the Unlicensed Electricity Generation on the Electricity Market” and “Communication Concerning the Application of Regulation on the Unlicensed Electricity Generation on the Electricity Market” that came into force in October 2013. If the solar system connects to the grid via a transformer of the local distribution company,

it is classified as a low voltage connection and has limitations such as: a maximum 30% of the capacity of each transformer is allowed for all renewables connected to it and additionally, each individual applicant is allowed a maximum 10% of the transformer's capacity. Alternatively, if the solar system connects to the grid via a transformer that belongs to the solar system, it is classified as a medium voltage connection. Here the limit of the connection is raised to match the capacity of the transformer. The disadvantage of this method is the transformer cost, elevating investment costs by 2-3%. The capacity of transformers supplying forest villages is typically between 50-100kVA. In these cases, the maximum capacity of a solar power plant for direct connection would be 15-30kW. Hence, in such situations where higher capacity installations are required, a transformer needs to be purchased for an indirect connection.

With a significant area of land, much of it of limited agricultural value, and high levels of annual solar irradiance, the country is particularly well suited to solar PV development. However, to date, Turkey's progress on solar renewable energy has been limited. The only notable use of the resource has been in the thermal sector, which yielded 1.5TWh in 2000, which is equivalent to ~ 0.15% of total energy consumption across the country. This limited benefit from solar has been due to an unappealing financial, legislative and institutional environment. Whilst in recent years there has been significant government rhetoric on encouraging renewables, supported by, for example, the introduction of financial incentives such as a Feed-in Tariff (FiT), the level of these efforts is still considered to be insufficient to kick-start the industry into achieving the great potential it promises. The government target, for example, of 3GW PV installed capacity by 2023, appears to be remarkably unambitious for a country of high average solar irradiance when compared to Germany, which has half the land area and 30% less irradiance, which has recently been installing 7.5GW per year, and has so far reached 38GW.

The Main FiT component for PV of \$0.133/kWh (for 10 years) is thus theoretically capable of being raised to \$0.20/kWh (for the first 5 years) if all sub-components are of domestic origin. However, in practice, no producers have been able to get adequate licensing under the challenging certification process for their equipment to fully qualify for the domestic component, which demands that at least 55% of all production is of Turkish origin. Some producers have managed to get partial licensing for some elements of their equipment (2 producers of inverters, 2 companies as candidates at the end of 2014) and the maximum practicable achievable level of the domestic component is currently \$0.007/kWh. The maximum total FiT support as it currently stands then is \$0.14/kWh fixed for the first 5 years plus \$0.133/kWh fixed for the subsequent five years. There is an additional domestic FiT component available for the utilization of domestically produced equipment which lasts for just 5 years, again banded by generation mechanism and, within this, further subdivided by the level of individual components that are locally sourced.

A scheme such as this project, combined with lobbying activity to change legislative practices, would help kick-start the industry and give some of the neediest people in Turkey access to green energy – helping mitigate climate change whilst assisting in the plight of these poverty stricken forest villagers.

The project seeks to remove barriers regarding the forest villager's benefiting from the solar PV installations and thus contribute to the GHG emission reductions as well as rural development for the poorest community of the country through establishing sustainable financing mechanisms. The ORKOY's support system for forest villages is a key tool to achieve this backed by other possible financial mechanism. The project is aiming to establish a 30 MW capacity in 4 years with 575,000 tonnes of CO<sub>2</sub>e direct life-time emission reductions and 1,437,480 tonnes of CO<sub>2</sub>e life-time indirect emissions reductions. Moreover, with the removal of the barriers the PV market for forest villages is expected to grow further within the next 10 years with greater emission reduction figures.

A.5. Incremental /Additional cost reasoning: describe the incremental (GEF Trust Fund/NPIF) or additional (LDCF/SCCF) activities requested for GEF/LDCF/SCCF/NPIF financing and the associated global environmental benefits (GEF Trust Fund) or associated adaptation benefits (LDCF/SCCF) to be delivered by the project:

<b>Value-Added of GEF Involvement in the Project Demonstrated through Incremental Reasoning</b>	
<b>The baseline</b>	<b>GEF Alternative</b>

<b>Component 1. Policy &amp; Institutional Framework for supporting Sustainable energy financing mechanism for solar power in forest villages</b>	
<p>No scheme for support of PV installations in forest villages is in place. Villagers interested in residential PV installation have to use the unlicensed procedure and apply to the regional electricity distribution company directly. However no scheme, framework or any supporting mechanism is available, which limits the potential project to almost zero. It is expected that only a few residential installation would be developed without the support scheme in next four years (up to 100 installations with max installed capacity 30 kWp each). The benefit from such installations will go directly to the individual households and will not have a positive social effect to the community. The overall spread of the information about the PV technologies and related issues (technical conditions, permitting procedure, supply chain, operation of the installation) is very low among average villagers. Following the previous issues, the most important is the lack of available funding among the forest villagers. The sole household is limited in getting the funding from banks, mostly the installations connected with the households belonging to some entrepreneurs from various sectors will have enough funding and experience to implement the residential PV successfully. Further no special support from the local distribution authority could be expected in case of the grid capacity or other technical problems in case of sole projects in distant regions. It is expected, that only of-grid systems in areas with very limited access to grid or often black outs will expand rapidly due to the need of overcoming these substantial problems. Due to the limited number of installations no need or push on the regional distributing companies will arise to enable the innovative approaches in the residential PV operation (e.g. net metering). To introduce this approach the strong demand on site of PV operators is substantial.</p>	<p>The detailed evaluation of available business models will be carried out with special focus on cooperative model of PV installation. This system enters the cooperative as an eligible partner for financing and multiplies the social benefit of each installation. The larger projects can be developed (100 – 300 kWp) in this regime, the main limitation would be the technical capacity of the village transforms and the connection grid. The ORKOYs Credit Programme will be revised and updated to correspond with needs of the cooperative type of installations. The strong framework will be established including the model of contract for installation, pre-negotiated conditions with the regional distribution offices, and the technical analysis of the grid conditions. All of these steps and outputs will be intensively and widely disseminated across the regions among forest villagers, regional distribution offices, producers of PV equipment and suppliers of the PV installations. This will increase significantly not only demand on the side of forest villages, but also involvement of the PV value chain to promote their services. The key factor is the availability of funding for the forest villagers. As it was already described, the four step approach is planned first as a 100% grant for the pilots , later the partial grant and soft loan combination, with introduction and increasing of the private funding in later phases of the project. As a strong partner, the ORKOY SEFM unit can negotiate with the regional distribution companies the strategy, how to apply the innovative ways of PV operation/accounting for the benefit of forest villages. This activity will enable the wider introduction of such schemes in the national level and will contribute significantly to the PV market development of the country.</p>
<b>Component 2. Solar PV demonstration Projects</b>	
<p>Currently no small scale demonstration projects have been installed in the regions. The installations which can be used for lessons learned are usually large scale (over 1MWp</p>	<p>The four pilot sites will be selected for the development of the 100kWp installations in a cooperative model. The selection will be made according to the multi-criterial scheme developed by</p>

<p>with different permitting procedure) or some residential rooftop installation in urban areas. Therefore there is a lack of resources for education and knowledge building among the forest villages and the existing ones are of different type/scale which doesn't bring required effect in building the familiarity and credibility in the PV technology.</p>	<p>this project. All steps of the construction will be monitored and documented. The video documentation will be prepared and broadcasted; the manual how to develop the PV installations for forest village cooperatives will be prepared based on the existing experience. Together with set of workshops and training (involved cooperatives, PV value chain, banks) these outputs will contribute to the high awareness level and building the familiarity and credibility of the cooperative PV model. The information about the successful pilot projects will be disseminated on regional and national level, all forest villages (21,549) will be reached through the local ORKOY offices.</p>
<p><b>Component 3. Replication and scaling up – Enhancement of the sustainable energy financing mechanism</b></p>	
<p>No programme on awareness rising focused on solar PV is operated by the ORKOY. The level of solar installations is limited due to the lack of information (permitting procedure, available technologies) and availability of funding for forest villagers.</p> <p>No quality standards focused on small scale domestic equipment are developed, which creates problems with the quality of installed projects not only in core equipment, which is usually in compliance with the international standards, but also with the related technologies (supporting frames and structures, data collection systems, monitoring systems etc.). There are missing conditions for the establishing of the voluntary carbon market related to the PV under ORKOY Credit Programme.</p>	<p>National Awareness rising programme will be developed, which enable effective distribution of the information to the all PV supply chain and other stakeholders. The success stories from the pilot sites will be adopted to demonstrate the technical viability and also the reasonability of the cooperative model. Special focus under this component will be put on the banks and other financing institutions to bring the commercial financing into 3<sup>rd</sup> and 4<sup>th</sup> step of the proposed financial model (combination of the soft loan with the commercial financing).</p> <p>The quality standards for the project installations will be developed. This approach will support the regional suppliers' involvement into the scheme and give the preference to quality companies. The awarding ceremony scheme will be developed for the best projects under the SEFM. It will increase the marketing value of the scheme and will help to the involved suppliers also on the market outside the project borders.</p> <p>The installation of at least 30MWp is planned (as described in paragraph 59) by the end of the project which represents 28,750 tonnes of CO<sub>2e</sub> being reduced per annum by the end of the project and also approx. 450 new working positions directly for the villagers on the operation of their installations (maintenance, security).</p> <p>The MRV system will be developed under the project to monitor the key indicators of the project. Based on the project development results the plan of activities for the voluntary carbon market will be prepared. It will provide the other options for the scaling up phase and will create the post-project phase more attractive to the other investors.</p>

At the current time there has been no major emphasis of the ORKOY programme on supporting renewable energy power generation projects and the capacity of ORKOY staff to support such activities is very low. The scale of such investments are much higher than for home insulation and for solar water heating and higher levels of due diligence are required so it is unlikely that in a business as usual scenario, the ORKOY programme would be expanded to also support solar PV. The key issue for forest villagers is the affordability of the residential solar PV system and the electricity it will generate. While the technology costs of solar PV have fallen dramatically in recent years, forest villagers have limited capital of their own available and very limited access to financing, and when financing is available it often costly. In general the affordability of renewable energy is highly sensitive to financing costs due to renewable energy's upfront capital intensity. Without this project, it is initially estimated that a maximum of 3MW of solar PV might be deployed in forest villages over the next five years.

It is estimated that approximately 3,600,000 MWh of electricity is consumed each year by approximately 7 million inhabitants of forest villages in Turkey. Given that these villages are all, or almost all, grid connected we can make an initial calculation that the total greenhouse gas emissions in Turkey from electricity generation in all forest villages are approximately 2,178,000 tonnes per annum from forest villagers using the grid emission factor for Turkey of 0.605 tonnes of CO<sub>2</sub>e/MWh. With the GEF intervention it is estimated that over 2.5% of all forest villages in Turkey should be able to benefit from the ORKOY soft loans and planning to install or have installed 30MW of solar PV systems by the end of the project resulting in approximately 28,750 tonnes of CO<sub>2</sub>e being reduced per annum by the end of the project or shortly thereafter. Over a 20 year lifetime of the solar PV systems this works out to approximately 575,000 tonnes of CO<sub>2</sub>e reduced (28,750 x 20 = 575,000) which represents approximately US \$6.57 of GEF money spent per tonne of CO<sub>2</sub> reduced which, if achieved, is a highly cost-effective number.

A.6 Risks, including climate change, potential social and environmental risks that might prevent the project objectives from being achieved, and measures that address these risks:

Description	Date Identified	Type	Impact & Probability 1 (low); 5 (high)	Countermeasures / Management Response
ORKOY loan mechanism is not sustainable	During PIF. Updated during project formulation	Organizational and regulatory	I: 4 P: 1	<p>ORKOY has been running its support mechanisms since 1974 with its obligations coming from the Law 2924. With GoT having a rural development focus, support mechanisms for economic development in rural areas are likely to continue in the future including the finance mechanism of ORKOY. Moreover, the GoT has published a new action plan for 2014-2018 on Energy Development Program Depending on Domestic Sources. In the action plan, it clearly states to undertake solar energy implementations in a shorter term and in an intense way.</p> <p>In case of support for solar PV, the historic experience of ORKOY indicates that upon successful demonstrations followed by awareness rising and communication activities, the necessary environment is likely to occur to achieve success on solar PV in forest villages. The project will have 4 pilot demonstrations in the first year that will be followed by capacity building activities towards ORKOY central and local staff as well as advertising activities towards forest villagers and cooperatives to create the willingness and</p>



				<p>motivation coming from forest villages. This will ensure the motivation of ORKOY decision-making during and after the project period. This fact has been highlighted several times by the ORKOY decision makers during the PPG period.</p> <p>Defaults rates can approach zero if appropriate legal structures are put in place eg US solar loan products from Mosaic reports default rates of 0% for their commercial scale projects and 0.2% for residential.</p> <p>Loans should be considered as project finance rather than debt finance. In this way, a legal framework can be established under which FiT income is paid directly to creditors until loans are settled, such that the villages themselves do not have direct access to funds and are therefore unable to actively default. The debt repayment risk then falls upon the performance of the equipment and this risk can be negated by an appropriate warranty with the supplier/installer.</p>
The climate change phenomenon is affecting the project activities and success.	During PIF	Natural	I: 2 P: 3	Turkey is expected to be affected by the climate change phenomenon with drier periods, warmer summers and colder winters. These are not expected to affect the renewable energy situation in a negative way. On the contrary these can further trigger the demand for energy that is also related with renewable energy. The climate change is not expected to create a risk for the project.
Technical and capacity risks for ORKOY central and regional staff that are key to implementation and generalizing the solar PV in forest villages.	During PIF	Organizational	I: 4 P: 1	<p>The ORKOY finance system works through the demand coming from the forest villagers. The historic examples have showed that local staff of ORKOY is key to achieve success through informing and motivating the villagers. The key issue here is to increase the technical capacities in order to increase the motivation and ownership of ORKOY staff. Moreover, once the scheme for solar PV is in place, the technical capacities of ORKOY staff will be necessary to assess the applications and monitor the progress.</p> <p>ORKOY will allocate 2 full time staff as the loan officers (LO). First LO will be focused on the financial aspects of the scheme, the second LO will deal also with some technical aspects of the solar PV. The team will be supported by contracted international and local part time experts. The project will have systematic capacity building activities towards the central and local staff of ORKOY. The pilot demonstrations will be increasing the capacities of ORKOY staff that are</p>

				<p>working in 4 different regional directorates of General Directorate of Forestry. Moreover, these demonstrations and existing experience of these 4 regional directorates will be used to disseminate the know-how obtained to others. Furthermore, several other training programs will be executed by the project on project design for solar PV, monitoring, maintenance, evaluation, regulations regarding electricity generation etc. These activities are expected to decrease the probability of this risk.</p>
<p>Environmental and social risks of solar PV instalments and electric generation.</p>	<p>During PIF</p>	<p>Operational and strategic</p>	<p>I: 3 P: 2</p>	<p>The large-scale solar PV systems can cause land degradation and/or habitat loss due to the size of installments. However, the solar PV installments that are foreseen under this project are small-scale that are under 100 kwp.</p> <p>During the project preparation phase, the project development team has come up with draft site selection criteria that will be the base of ORKOY's conditions for solar PV. These criteria include no harm to habitats and biodiversity. Moreover, the project is planning to establish the solar PV panels within or nearby the village boundaries that are not valuable in terms of key habitats. Moreover, during the project preparation phase, several meetings and workshops were carried out to find out the best methodology for solar PV installation. All of the options were also assessed by the experts in terms of social risks too. The project preparation team has come up with the most suitable approaches that are having the least social conflict possibilities.</p> <p>Furthermore, the project will be implemented in accordance with UNDP's Social and Environmental Screening Procedures (SESP). The objectives of the SESP are to: (a) Integrate the SES Overarching Principles (human rights, gender equality and environmental sustainability); (b) Identify potential social and environmental risks and their significance; (c) Determine the Project's risk category (Low, Moderate, High); and (d) Determine the level of social and environmental assessment and management required to address potential risks and impacts.</p>
<p>Increased dependence on natural gas will lead to less demand for</p>	<p>During PIF</p>	<p>Political</p>	<p>I: 4 P: 2</p>	<p>The Government of Turkey wants to achieve security of energy supply and wants to reduce its dependence on imported oil and gas. New laws to promote and support renewable energy and a stated national target of 30% renewable by 2023 mean this risk is low. Awareness campaigns,</p>

renewable energy.				<p>trainings and study tours are planned to expand the knowledge about the solar PV appliances among forest villagers, governmental officers and installers and to guarantee expanding demand for renewable energy within the target group.</p>
Co-financing does not materialize	During PIF			<p>As the main beneficiary of the project, the ORKOY will contribute to the project with an amount of 45,000,000 through its loan mechanisms. ORKOY funding for its Credit Programme is already approved so this risk is very low. The release of funding depends on the demand by forest villages and this risk is already addressed above. Additional co-financing from forest villagers represents the in-kind contribution of technical, administrative, and maintenance staff for the solar PV systems, estimated at \$1.6 million in-kind contribution. As this contribution is expected to be in-kind there is no risk of it failing to materialize.</p> <p>Another key co-financer is the private sector with an amount of 125,000 through Gunder association.</p>
Lack of financial support in the solar PV market for small-scale projects by banks.	During project formulation	Financial	I: 3 P: 2	<p>In Turkey, mainly due to lack of experience among financing institutes, project financing is currently limited for small scale solar PV schemes and so most debt is based upon the balance sheets of sponsors and, in this particular case, with forest villagers being some of the poorest members of Turkish society, their access to this is both severely limited and perceived as high risk and is therefore penalized with high interest rates.</p> <p>During the project development phase, several meetings have been undertaken with banks and international financing organizations to develop methods to overcome this barrier. Project will focus on developing alternative financing mechanisms on top of ORKOY's financing scheme.</p> <p>The workshops, media releases and study tours are planned during implementation phase to increase the involvement of the potential partners from banking sector.</p>
Application process is complex and long.	During project formulation	Regulatory	I: 4 P: 1	<p>Although the application for unlicensed projects are easier, still the current application process has so many steps and is quite time consuming. For an average forest villager this is a barrier and unless a faster and easier way is defined and implemented, it creates a risk in terms of less application.</p> <p>During the project preparation phase this issues has been discussed among various stakeholders</p>

				and it is agreed to ease the process for forest villagers. TEDAŞ is currently working on developing a faster system for roof installments with smaller scales projects. TEDAŞ indicated that their new application procedure will be operational soon and a similar system can be developed for forest villages under a protocol between TEDAŞ and General Directorate of Forestry. This will minimize the risk of forest villager’s avoidance of solar PV applications.
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A.7. Coordination with other relevant GEF financed initiatives

Integrated Approach to Management of Forests in Turkey, with Demonstration in High Conservation Value Forests in the Mediterranean Region of Turkey Project is currently under implementation by UNDP and granted by GEF. Project aims to ensure multiple benefits of forests focusing on climate change mitigation and biodiversity benefits at landscape level. Both projects will be led by the same unit under UNDP and General Directorate of Forestry (GDF) is the beneficiary of both Projects. Therefore close collaboration of the projects will be achieved. Participation of both the UNDP Project Management Unit and Ministry of Forestry and Water Affairs on Project Steering Committees of both projects will assist in enhancing coordination between the two projects. **The MRV activities under component 3 of this project, which includes the hiring of an international MRV expert, as well as MRV capacity building activities will contribute to the project and ORKOY itself.**

GDF is also implementing the Murat Basin Rehabilitation Project in Eastern Turkey covering Elazığ, Muş and Bingöl provinces with 25 micro-basins. The project is funded by IFAD and GDF. The project aims to stop natural resources degradation and contribute to the poverty reduction in the region. Forest villages are one of the key target groups of the project and ORKOY has a key role in the project, establishing the coherence between two projects is important in order to maximize the efficiency. One of the project’s pilot provinces is Elazığ that is also the demonstration site of the solar PV project.

GDF’s another project is the Çoruh River Watershed Rehabilitation Project supported by JICA. The project is implemented in northeast Turkey covering a region of greater than 2 million hectares. Project objectives are to provide integrated watershed rehabilitation including vegetation, soil and water resources; Better living conditions for the rural population; Soil conservation; Rehabilitation of degraded forests; Prevention of natural disasters (avalanche, flood and overflow control). Some of the project activates will contribute to the solar power panels in order to reduce the use of fossil fuels. As ORKÖY plays a key role in this project lessons learnt from this project can contribute to the Project.

As a key stakeholder to the Project, GUNDER is undertaking several projects regarding the improving the market for solar PV in Turkey. Two of these projects are key to the subject. Development of Advocacy, Lobbying and Campaigning Constituencies on Solar Power to Develop Alternative Supply Narrative Project is supported by European Climate Foundation and aims to develop political will to scale up electricity production from solar power through lobbying, advocacy, campaigning and constituency building to develop alternative supply debate. The project will undertake several awareness raising activities aiming at public institutions and general public. The other project of GUNDER is PV Financing and is granted by Horizon 2020 program of EU. GÜNDER is one of the member of the implementing consortium led by BSW Solar. The goal of the project is to help stakeholders with the implementation of PV projects based on the new business models while using various equity financing schemes. The project has a direct link with the Solar PV project in terms of investigating finance of solar PV.

As a part of EBRD, Turkey Private Sector Sustainable Energy Finance Facility (TURSEFF) is providing special credit lines to eligible banks for on-lending to private sector borrowers for energy efficiency (“EE”) and small-scale

renewable energy (“RE”) investments. The influence on the small-scale RE produces would be multiplied in cooperation with this project.

**B. ADDITIONAL INFORMATION NOT ADDRESSED AT PIF STAGE:**

**B.1 Describe how the stakeholders will be engaged in project implementation.**

The Department of Forest Village Relations (ORKÖY) under General Directorate of Forestry of Ministry of Forestry and Water Affairs is the main beneficiary of the project. With its long lasting existence and working relations with forest villagers ORKÖY is one of the most experienced public organizations in Turkey in terms of rural development. ORKÖY has been the center for supplying the fundamental needs of forest villagers through its loan programs. The organization has been implementing GHG emission reduction related loans including house isolation and solar thermal heating for several years. ORKÖY’s success on these has triggered organization’s will to include solar electric generation.

Project Stakeholder	Relationship With The Project
<p>Ministry of Forestry and Water Affairs (MFWA)</p>	<p>Ministry of Forestry and Water Affairs (MFWA) is the organization that is responsible from management and protection of natural resources including forests and water resources in Turkey. MFWA has six general directorates operating in different subjects: State Hydraulic Works, Nature Conservation and National Parks, Forestry, Water Management, Combating Desertification and Erosion, State Meteorological Service.</p> <p>General Directorate of Forestry (GDF) is the organization responsible from management, development and protection of forests in Turkey. Organization’s mission is to protect forest resources against any threats and danger, to develop forest resources in a nature-friendly manner and to achieve sustainable forest management at a level that will provide far-reaching sustainable benefits for society in ecosystem integrity. Project beneficiary ORKOY is a department working under GDF.</p>
<p>Forest and Village Relations Department (ORKOY)</p>	<p>Working under General Directorate of Forestry (GDF) of Ministry of Forest and Water Affairs, ORKOY has a long history of working with people living in and around forests. ORKOY, GDF will be the Executing Partner of the GEF Project and will provide the soft loans necessary to make sure that the projects are successfully implemented. The ORKOY was founded in 1970 and has gone through several organizational changes. Up to recent years ORKOY was itself a General Directorate but following changes in the structure of Ministry of Forestry and Water Affairs it has been placed under GDF as a department. ORKOY aims to contribute to the conservation of forests through supporting the local communities. ORKOY has been operating a grant/loan program since 1974 targeting the forest villagers. Main duties of the organization are:</p> <ul style="list-style-type: none"> <li>• To support socio-economical development of forest villagers;</li> <li>• To undertake inventories and researches as well as planning projects and implementation;</li> <li>• To develop and implement projects on decreasing the wood consumption and alternative energy resources;</li> <li>• To support the industry on wood and non-wood related product;</li> <li>• To direct all sorts of loans and support mechanisms to forest villagers;</li> <li>• To enable efficient use of products through supporting cooperatives on a project base;</li> <li>• To undertake village transfer related tasks according to law no 2924.</li> </ul>

<p>Ministry of Environment and Urbanization (MoEU)</p>	<p>Ministry of Environment and Urbanization is the focal point of UNFCCC. The Climate Change Department under the General Directorate of Environmental Management is one of the key stakeholders to the project. MoEU has released the MRV legislation that is directly linked to the project. Moreover, MoEU is leading the Turkey part of World Bank supported Partnership for Market Readiness (thepmr.org) program that can have close links to the Project.</p>
<p>Ministry of Energy and Natural Resources (MRNR)</p>	<p>The Ministry of Energy and Natural Resources is responsible for developing energy policy for Turkey and policies related to natural resource use. The Energy and Environmental Management Department under the General Directorate of Energy Affairs is one of the key stakeholders to the project. This department is responsible from monitoring and assessment of carbon emissions related to the energy sector as well as defining the climate change policies regarding the sector. Moreover, General Directorate of Renewable Energy is another key stakeholder to the project. They are the key organization to identify renewable energy policies of Turkey. Although their role is limited in terms of Solar Energy Project applications by individuals (they are responsible from assessment of application in terms of controlling the possible overlaps between different projects in the same region) they are key to sustainability of the project.</p>
<p>Ministry of Development (MoD)</p>	<p>The Ministry of Development (MoD) is natural member of the Project Board/Steering Committee, with a responsibility for defining, assessing, and monitoring programme outputs towards country-level outcomes to ensure that the project results have been linked to the national development plans. MoD will work closely with UNDP to ensure that the plan of the programme includes necessary aspects, including identification of projects required to achieve the expected outcomes. MoD will be represented on the Project Steering Committee and provide inputs related to solar PV technologies for promoting sustainable development as well.</p>
<p>Turkish Electricity Distribution Company (TEDAS)</p>	<p>TEDAS is the state economic enterprise responsible to undertake approval procedure of energy projects including photovoltaic according to the related legislations (i.e. Law#5346 “Law on Utilization of Renewable Energy Sources For the Purpose of Generating Electrical Energy”). TEDAS is the key stakeholder of the project. TEDAS identifies the energy project’s structure, properties etc. All energy projects are currently approved by TEDAS before they are initiated. TEDAS has local offices but currently project approvals are handled in Ankara headquarters. TEDAS is currently working on easing the procedure for unlicensed PV projects less than 30 kW. The project will envisage methods for establishing PV in forest villagers specific to the project and TEDAS’s role and cooperation with GDF is key to the success of the project.</p>
<p>Turkish Electricity Transmission Company (TEIAS)</p>	<p>TEIAS is the state economic enterprise responsible for transmission of electricity within the country. TEIAS is a key stakeholder to the project in terms of defining the quotas for electricity feed in. The regional distribution utilities approaches TEIAS and ask for suitability of energy projects in terms of quotas. TEIAS’s contribution and approach to the project is therefore key to the project strategy.</p>
<p>Energy Market Regulation Authority (EPDK)</p>	<p>Energy Market Regulatory Authority has been founded in 2001. The main aim of the organization is to perform the regulatory and supervisory functions in the energy market. The objectives of the organization are; to ensure the development of</p>

	<p>financially sound and transparent energy markets operating in a competitive environment and the delivery of sufficient, good quality, low cost and environment-friendly energy to consumers and to ensure the autonomous regulation and supervision of these markets. EPDK has regulatory functions such as licensing to transcribe the entries and exits to the market; regulating the market to assure non-discriminatory third party access to the monopolistic infrastructures such as grids; ratemaking to inhibit monopoly rents; and supervising and penalizing (if necessary) to make sure that the market participants are in compliance with the rules and regulations. Although EPDK is a higher policy making organization their role in the project can be key to overcome specific barriers in terms of defining the methodology, permissions and ensuring the replicability of the project results.</p>
<p>Turkish Utilities (Private sector)</p>	<p>Turkish utilities will purchase the electricity provided by the solar PV systems through power purchase agreements, either on the spot market or through longer-term agreements. Electricity will be purchased in accordance with the Turkish legislation on preferential feed-in-tariffs for renewable energy. Three of these utilities are key to the project in terms of projects pilot areas. Osmangazi EDAŞ is the local company for Afyon Project site. Fırat EDAŞ is the distribution company in Elazığ Region, Yeşilirmak EDAŞ is the distribution company for Çorum and finally Meram EDAŞ is the company for Konya region. The project will keep these organizations in the loop in terms of successful implementation of the project activities.</p>
<p>Forest Cooperatives and the OR-KOOP</p>	<p>Forest cooperatives are legal non-governmental bodies consist of forest villagers with a mandate of development of forest villagers. OR-KOOP (Central Union of Turkish Forest Cooperatives) is the organization that is representing the forest cooperatives in Turkey with its headquarter in Ankara. OR-KOOP is an organization that is founded by 27 regional forest cooperative unions with more than 2,000 cooperative members. The forest cooperatives are eligible to be supported by ORKOY. Forest cooperatives will be supported by GDF in terms of capacity building activities to maximize benefits of the sustainable energy-financing program. The role of forest cooperatives will be to utilize ORKOY soft loans with the goal of investing in small-scale solar PV systems.</p>
<p>Forest Village Legal Entity</p>	<p>Forest Village Legal Entities are the smallest governance body in Turkey. It is managed by the “Mukhtar”, Head of Village, who was elected for 5 years period during national elections. Forest village legal entities are eligible to be supported by ORKOY. The GEF project will support forest village legal entities in terms of capacity building activities. Two villages to be selected for demonstration component of the project will benefit from the sustainable energy finance program with GEF partial finance support and the Government co-finance. In return, the forest village legal entity will be responsible on running the system and serve as a training centre for the deployment of the program.</p>
<p>Agriculture and Rural Development Support Institution (TKDK)</p>	<p>TKDK is an institute working under Ministry of Food, Agriculture and Livelihood that is eligible for supporting rural development under IPARD program of Turkey. TKDK has a grant scheme made of IPARD and national funding that supports instalments of solar PV systems. The main aim of the program is to give credits to support rural development. Currently the program has initiated its 13<sup>th</sup> call for proposals. Both individuals and organizations are eligible for crediting. Any solar PV instalment up to 1 mw that is to match the energy needs of facilities such as</p>

	<p>integrated animal husbandry systems can be supported within the program. Although, currently solar energy is the only renewable energy source that is eligible, in the near future other renewables will be added to the portfolio.</p>
<p>Domestic and International Banks (private sector)</p>	<p>Initially, it is expected that domestic and international banks would have no role in the project as they cannot compete with zero interest soft loans from ORKOY. However, the ORKOY soft loan programme (initially US \$45 million) is not going to be large enough to cover the financing needs for solar PV for all forest villagers and over time technology and financing costs are expected to come down. Therefore, under component 3 of the project it will be important to bring in domestic and international banks to see how they might provide financing for further investment in solar PV systems for forest villagers.</p> <p>DenizBank, one of the private banks in Turkey has a financing scheme for solar PV projects for private sector. During the stakeholder consultation meetings of the PPG period a meeting was held with DenizBank team. The Bank has a good experience on solar PV projects and financing in Turkey that can contribute to the Project implementation. Moreover, DenizBank has been working with agricultural cooperatives that have similar structure with forest cooperatives.</p> <p>Moreover, several public banks in Turkey (mainly Ziraat Bankası and Halkbank) have a long history and great experience on supplying credits to farmers and villagers. Their contribution to the project in terms of establishing financial structures can be a positive asset.</p>
<p>Solar PV installers/manufacturers (private sector)</p>	<p>The role of the solar PV installers/manufacturers will be to install and maintain solar PV equipment for forest villagers who will have successfully obtained financing either from the ORKOY soft loans or later from domestic and international banks. The solar PV installers should benefit from the fact that this project will lead to greater interest and uptake in solar PV systems. In Turkey, the domestic solar PV installers and manufacturers have been increasing during the last years. They are mostly the members of the GUNDER (see below). Private sectors role on policy making is a key asset for the project.</p>
<p>International Solar Energy Society – Turkish Section GUNDER</p>	<p>International Solar Energy Society – Turkish Section (GUNDER) is the umbrella organization of solar PV companies in Turkey. The aim of the society is to promote all activities directed at the better utilization of solar energy. Since GUNDER is an umbrella organization serving not only governmental bodies but also private sector, GUNDER is a partner of the GEF project. Some of technical support activities will be implemented by GUNDER along with capacity development activities for sustainable energy finance program, through a project cooperation agreement with UNDP. They will be a co-financer of the project and contribute to the project activities.</p>
<p>WWF Turkey (NGO)</p>	<p>WWF-Turkey is committed to stopping the degradation of Turkey’s natural environment and building a future in which humans live in harmony with nature. Addressing climate change is one of the main pillars of WWF-Turkey’s strategy. For effective climate change mitigation, scaling up the share of renewable energy in power generation, as well as primary energy demand is a top priority for WWF-Turkey. Organization has recently conducted a research in collaboration with Bloomberg New Energy Finance and on energy policies of Turkey named “Turkey’s Changing Power Markets”. As of early January 2015, WWF-Turkey has submitted a</p>



	<p>proposal to UK Prosperity Fund, “Laying the Groundwork (Legislation, Business and Finance Models and End-User Awareness) in Order to Scale up Residential Solar Power in Turkey” that is relevant with the project. Main objectives of the project are (i) to provide legislative and policy recommendations to help establish a more effective and better functioning residential solar PV market in Turkey and (ii) to provide accurate information, which will prevail over the widespread misinformation about the technical and economical feasibility of the use of residential solar PV, for prospective end-users.</p>
<p>Ziraat Bankası (Agriculture Bank)</p>	<p>Ziraat Bankası is one of the oldest and most widespread public banks of Turkey. With its widespread local branches, it has been a key bank for the people living in the rural areas. The bank has a long history and experience of given credits to the farmers and villagers. The beneficiary of the project, ORKOY, also has a long working history with the Bank. Currently its loan programs run through the bank. During the project preparation period Ziraat Bankası has been consulted on various possible financing mechanism for the project period. The bank was positive on collaborating with the project and the Ministry on developing solar-forest village specific credit lines and other financing mechanism. The bank will be a key stakeholder to the project.</p>
<p>French Agency of Development (AFD - The Agence Française de Développement)</p>	<p>AFD is a public development finance institution that has been working to fight poverty and foster economic growth in developing countries and the French Overseas Provinces for seventy years. AFD has been actively working in Turkey since 2005 with its headquarters in Istanbul and Ankara office. A framework agreement on bilateral cooperation for environmental protection was signed in 1996 between Turkey and France on environmental protection and AFD has been directly contributing to this framework. This bilateral cooperation concerns the major issues of common interest for the sustainable development of economies and societies. With specific targets on climate change and environmental protection in Turkey, AFD works with public and private institutions through variety of financial tools. During the project preparation phase the officials of AFD were consulted several times and they expressed their interest to provide low interest loans for solar PV in forest villages in Turkey.</p>

B.2 Describe the socioeconomic benefits to be delivered by the Project at the national and local levels, including consideration of gender dimensions, and how these will support the achievement of global environment benefits (GEF Trust Fund/NPIF) or adaptation benefits (LDCE/SCCF):

Cooperative model of the PV installation: In the PIF the residential solar installation in forest villages has been defined without specification on household/cooperative type of the installation. After investigation of the situation and based on the strategy of ORKOY to focus not only on the “energy aspect” of the project, but also on the social benefits it has been decided to focus mainly on the cooperative model of installation. As such, the benefits from the utilization of one PV plant will be multiplied on all cooperative members, the job positions for maintenance and security of the plants will be created (average 1,5 work position per site, costs for the employment will be covered from the plant revenues). The forest village cooperatives have a long term history and strong legal background under ORKOY, moreover the cooperative will be more acceptable partner for the bank investments in later phases of this project and post-project scaling up. However the sole household installations are not generally excluded from the project scheme.

B.3. Explain how cost-effectiveness is reflected in the project design:

The proposed project activities to promote the installation of solar PV systems in the forest villages represent the most cost-effective opportunity for ORKOY to significantly increase renewable energy production in forest villages. The initial assumption is that over 2.5% of all forest villages in Turkey should be able to benefit from the ORKOY soft loans and planning to install or have installed 30MW of solar PV systems by the end of the project resulting in approximately 28,750 tonnes of CO<sub>2</sub>e being reduced per annum by the end of the project or shortly thereafter. Over a 20 year lifetime of the solar PV systems this works out to approximately 575,000 tonnes of CO<sub>2</sub>e reduced (28,750 x 20 = 575,000) which represents approximately US \$6.57 of GEF money spent per tonne of CO<sub>2</sub> reduced which, if achieved, is a highly cost-effective number. In addition to these direct benefits, the project is expected to “jumpstart” the market for grid-connected PV systems in the regions. The demand for turnkey developers of the PV projects and operation, maintenance and servicing companies will grow in line with the number of project installations.

<b>Particulars</b>	<b>Direct: Project (20-year equipment life)</b>	<b>Direct: Post-Project</b>	<b>Indirect – Bottom Up: Post-project with replication (GEF Replication Factor of 3)</b>	<b>Indirect – Top Down: (GEF Causality Factor of 80%)</b>
Installed PV (MW)	30	100	75	30 – 300
Total CO <sub>2</sub> emissions reduced (tons)	574 992	1 914 723	1 437 480	4 599 936
CO <sub>2</sub> emissions reduced (tons) per GEF \$ (GEF Budget of \$3,780,000)	\$6.57	\$1.97	\$2.63	\$0.82

**C. DESCRIBE THE BUDGETED M & E PLAN:** The monitoring and evaluation (M&E) plan is detailed in Section 6 of the UNDP Project Document. The indicative monitoring and evaluation work plan and corresponding budget are presented in the Table below.

<b>Type of M&amp;E activity</b>	<b>Responsible Parties</b>	<b>Budget (US\$)</b>	<b>Time frame</b>
Inception Workshop (IW)	Project Manager Ministry of Forestry and Water Affairs, General Directorate of Forestry, UNDP, UNDP-GEF	30,000 (based on experience of UNDP CO)	Within first two months of project start up
Inception Report	Project Manager Project Board, UNDP CO	None	Immediately following IW
Measurement of Means of Verification for Project Results	Project Manager will oversee the hiring of specific studies and institutions, and delegate responsibilities to relevant team members	To be finalized in Inception Phase and Workshop. Cost to be covered by targeted survey funds.	Start, mid and end of project

<b>Type of M&amp;E activity</b>	<b>Responsible Parties</b>	<b>Budget (US\$)</b>	<b>Time frame</b>
Annual Measurement of Means of Verification for Project Progress and Performance	Oversight by Project GEF Technical Advisor ,Project Manager and M&E local expert	TBD as part of the Annual Work Plan's preparation. Cost to be covered by field survey budget.	Annually prior to APR/PIR and to the definition of annual work plans
APR/PIR	Project Team Project Board UNDP-RTA UNDP-GEF	None	Annually
QPR	Project Team (including M&E local expert)	None	Quarterly
Project Board meetings	Project Manager	None	Following IW and annually thereafter.
Technical and periodic status reports	Project team Hired consultants as needed 13, 750	13,750	TBD by Project team and UNDP-CO
Mid-term External Evaluation	Project team Project Board UNDP-GEF RCU External Consultants (evaluation team) – 18,000	20,000	At the mid-point of project implementation.
Final External Evaluation	Project team, Project Board, UNDP-GEF RCU External Consultants (evaluation team) – 18,000	20,000	At the end of project implementation
Terminal Report	Project team Project Board External Consultant	None	At least one month before the end of the project
Audit	UNDP-CO	5,000 in project life-time	Yearly

Type of M&E activity	Responsible Parties	Budget (US\$)	Time frame
	Project team (included in PMC costs)		
Visits to field sites (UNDP staff travel costs to be charged to IA fees)	UNDP-CO, UNDP-GEF RCU Government representatives	None	Yearly average one visit per year
TOTAL (indicative) COST (Excluding project and UNDP staff time costs)		88,750	

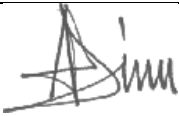
**PART III: APPROVAL/ENDORSEMENT BY GEF OPERATIONAL FOCAL POINT(S) AND GEF AGENCY(IES)**

**A. RECORD OF ENDORSEMENT OF GEF OPERATIONAL FOCAL POINT(S) ON BEHALF OF THE GOVERNMENT(S):**  
 (Please attach the [Operational Focal Point endorsement letter\(s\)](#) with this form. For SGP, use this [OFP endorsement letter](#)).

NAME	POSITION	MINISTRY	DATE (MM/dd/yyyy)
Mr. Prof. Dr. Lutfi AKCA	Undersecretary	MINISTRY OF FOREST AND WATER AFFAIRS	MARCH 28, 2014

**B. GEF AGENCY(IES) CERTIFICATION**

This request has been prepared in accordance with GEF/LDCF/SCCF/NPIF policies and procedures and meets the GEF/LDCF/SCCF/NPIF criteria for CEO endorsement/approval of project.

Agency Coordinator, Agency Name	Signature	Date (Month, day, year)	Project Contact Person	Telephone	Email Address
Adriana Dinu UNDP-GEF Executive Coordinator		November 30, 2015	John O'Brien Regional Technical Advisor, EITT	(+90) 212 512 58 53	john.obrien@undp.org

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

<b>This project will contribute to achieving the following Country Programme Outcome as defined in the 2011 – 2015 CPD for Turkey</b>					
Outcome 3: Strengthening policy formulation and implementation capacity for the protection of the environment, and cultural heritage in line with sustainable development principles and taking into consideration climate change and disaster management					
<b>Country Programme Outcome Indicators:</b> Reductions in the level greenhouse gas emissions.					
<b>Primary applicable Key Environment and Sustainable Development Key Result Area (same as that on the cover page, circle one):</b> Enhanced national capacity to develop market for and access to environmental funds to support strategic environmental protection areas, including (b) climate change adaptation and mitigation. Focus area Energy (renewable energy and energy efficiency)					
<b>Applicable GEF Strategic Objective and Program: Climate change objective3:</b> To promote investment in renewable energy technologies					
<b>Applicable GEF Expected Outcomes:</b> 3a Appropriate policy, legal and regulatory frameworks adopted and enforced; 3b Sustainable financing mechanisms established and operational; 3c GHG emissions avoided.					
<b>Applicable GEF Outcome Indicators:</b> 3a Extent to which EE policies and regulations are adopted and enforced; 3b Volume of investment mobilized; 3c Avoided GHG emissions from on-grid PV electricity generation (tons CO <sub>2</sub> /MWh); and \$/t CO <sub>2</sub> .					
Strategy	Indicator	Baseline	Targets	Source of Verification	Assumptions
<b>Project Objective: To support the successful launching of a sustainable energy financing mechanism within the ORKOY social credit mechanism to ensure that by the end of the project there is at least 30 MW of installed capacity of grid-connected, residential solar PV in forest villages in Turkey (approximately 2.5% or 175,000 people living in forest villages will have their electricity needs met by solar PV) by the end of the project</b>	• Amount of reduced CO <sub>2</sub> emissions from the power sector (compared to the project baseline) by EOP, tons CO <sub>2eq</sub>	• 0	• 28,750	Project’s annual reports, GHG monitoring and verification reports	Continued commitment of project partners, including Government agencies and investors / developers    1,5 work positions per project (maintenance, security)
	• Cumulative installed capacity of grid-connected PV systems (kWp)	• 0	• 30,000	Project final evaluation report	
	• Cumulative total electricity generation from installed grid-connected PV systems (kWh/year)	• 0	• 47,520,000	Post project market monitoring and evaluations	
	• Cumulative number of created job positions for forest villagers related to solar pv	• 0	• 450	Annual reports from forest cooperatives	
	• Number of people living in forest villages in Turkey will have electricity needs met by solar power	• 0	• 175,000		

<b>Component 1.</b>					
<b>Policy &amp; Institutional Framework for supporting Sustainable energy financing mechanism for solar power in forest villages</b>					
<b>Outcome 1.1</b> Enhanced enabling policy and environment, within which ORKOY's sustainable energy financing mechanism continues to operate beyond the lifetime of the project	<ul style="list-style-type: none"> <li>SEFM unit appointed, introduced and confirmed by ORKOY</li> <li>National Framework published and approved</li> <li>Technical report developed and published</li> </ul>	<ul style="list-style-type: none"> <li>None</li> <li>None</li> <li>None</li> </ul>	<ul style="list-style-type: none"> <li>5 months after project start</li> <li>6 months after project start</li> <li>7 months after project start</li> </ul>	Published documents. Projects annual reports.	Unchanged commitment of ORKOY and relevant stakeholders (utilities, government). Unchanged legislative framework.
<b>Component 2.</b>					
<b>Solar PV demonstration Projects</b>					
<b>Outcome 2.1</b> Sustainable Energy Financing Mechanism of ORKOY successfully finances four solar PV demonstration projects (each up to 100 kW in total) in forest villages, using either individual household and/or cooperative models	<ul style="list-style-type: none"> <li>No. of projects implemented</li> <li>No. of regions involved</li> <li>Total installed capacity of the projects (kWp)</li> </ul>	<ul style="list-style-type: none"> <li>0</li> <li>0</li> <li>0</li> </ul>	<ul style="list-style-type: none"> <li>4</li> <li>At least 3</li> <li>400</li> </ul>	Project documents Approvals from competent bodies Press releases	Unchanged commitment of ORKOY and interest of forest villages
<b>Component 3.</b>					
<b>Replication and scaling up – Enhancement of the sustainable energy financing mechanism</b>					
<b>Outcome 3.1:</b> Sustainable Energy Financing Mechanism of ORKOY successfully provides soft loans to contribute to the	<ul style="list-style-type: none"> <li>Amount of reduced CO<sub>2</sub> emissions from the power sector (compared to the project baseline) by EOP, tons CO<sub>2</sub>eq</li> <li>Cumulative installed capacity of grid-connected PV systems (kWp)</li> </ul>	<ul style="list-style-type: none"> <li>0</li> <li>0</li> </ul>	<ul style="list-style-type: none"> <li>28,750</li> <li>30,000</li> </ul>	Project's annual reports, GHG monitoring and verification reports	Unchanged commitment of ORKOY and relevant stakeholders (utilities, government).

<b>deployment of at least 30MW of solar PV during project lifetime</b>	<ul style="list-style-type: none"> <li>Cumulative total electricity generation from installed grid-connected PV systems (kWh/year)</li> </ul>	<ul style="list-style-type: none"> <li>0</li> </ul>	<ul style="list-style-type: none"> <li>47,520,000</li> </ul>		Successful implementation of demonstration projects Interest of other financial subjects in the program.
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**ANNEX B: RESPONSES TO PROJECT REVIEWS** (from GEF Secretariat and GEF Agencies, and Responses to Comments from Council at work program inclusion and the Convention Secretariat and STAP at PIF).

<b>STAP Review Questions</b>	<b>Responses to STAP Review</b>
<p>1. STAP welcomes this project which outlines an initiative which is all embracing in terms of financing; demonstration sites in forest villages where power quality is low and inhabitants generally poor (over half of total funding for two medium scale 100 kW PV plants and two 50 kW PV linked with solar hot water as hybrids); grid integration; soft zero interest loans to encourage scale up to 30MW; awareness raising and preparation of their NAMAs. The 2005 FIT programme for PV support was revised in 2012 but has not been taken up in rural villages. Capacity building is a key component of this initiative.</p>	<p>The project documentation has been prepared in line with the PIF. Several changes have been implemented based on the findings from the PPG phase. The support of the credit mechanism will be focused on cooperative model of the PV installations of average size 100kWp instead of small residential rooftop installations. Therefore the aim of the pilot sites has been changed on 4 cooperative PV pilots in different regions of total 400 kWp. The strong need for the introduction and gradual implementation of the innovative method of PV operation in terms of accounting (e.g. net metering) has been identified, this output has been introduced instead of NAMAs preparation, as the NAMA process is under development of the governmental bodies at the moment. All the economical modelling is based on the FIT mechanism as a cornerstone instrument in line with the Derisking Renewable Energy Investment methodology, as published by UNDP. The maximum emphasis is placed on the capacity building and awareness rising activities including trainings and workshops for different levels of the PV market members (forest villagers, cooperatives, regional offices of ORKOY, TEIAS, TEDAS, banks, manufacturers and EPC companies etc.)</p>
<p>2. The ORKOY budget is limited but they are planning to increase the budget in this area so this GEF funding would enable the barriers as listed to be overcome and PV deployment to occur more rapidly than what might otherwise be the case.</p>	<p>Based on the positive responses and findings from the PPG phase the contribution of ORKOY into the project budget has been increased already on USD 45 million to ensure successful implementation of the project target 30 MWp and further scaling up.</p>
<p>3. Component 1: The business model for the soft loans has not yet been confirmed. It is not clear who at ORKOY will make this decision and on what basis. The project could benefit from looking at similar efforts in other countries to avoid pitfalls, etc. Portugal and Spain are models that might be followed, with similar solar resources, so perhaps more appropriate than Germany or UK, also with successful programmes based on FITs.</p>	<p>The very detailed analysis of existing models and possible options has been made, including the review of foreign FIT schemes. As a result the introduction of the net metering has been integrated as a project output. The project documentation has been consulted with ORKOY during all steps, one of the first output to deliver will be the amendment of the existing Credit programme with respect to the needs of this project. The financing scheme will be divided on 4 phases. The first one will use grants only for financing of the pilot sites installation; second phase will use combination of GEF and ORKOY grants and ORKOY soft loan; third phase will introduce commercial loan together with GEF/ORKOY grants and ORKOY soft loan and the last phase will use deferred supplier payment tool in combination with ORKOY grant/soft loan and commercial line of credit. For more details see project document, section 2.4. and annex 8.</p>
<p>4. Component 2: Where will the four selected villages be located? If the ultimate objective is to scale up, it will be very important to carefully select the first four villages to demonstrate local</p>	<p>The methodology for the selection of pilot sites has been developed during the PPG phase. The selection of the four villages will be made on the basis of a combination of technical, environmental and financial criteria. Technical criteria will consider the solar irradiation potential of the selected sites, accessibility for the construction and transport, good conditions for</p>

<p>economic and environmental benefits. Will each village be representative of a different region within the (very large) country? And what level of co-financing is expected? If selection is to be based on technical and financial criteria, including solar irradiation potential of selected sites, where will this data come from? What type of analysis (or model) will be used to incorporate all of the variables? HOMER, RETSCREEN and LEAP may be worth investigating.</p>	<p>the grid connection, shading obstacles and orientation of the site with preferred southern orientation. From the environmental point of view the preferred sites should be hardly utilized for any other purpose. Financial criteria will relate to the ability of the forest villagers to provide co-financing for the demonstration projects. The villages will represent 4 different regions – Corum, Afyon, Elazig and Konya. For details see project document, Annex 9.</p>
<p>5. Component 3: Finance through the banks has been arranged in other countries in a similar way so there may be lessons to learn in this respect.</p>	<p>The interest of banks in participation in the project finance scheme has been investigated during the PPG phase. There is a positive response and interest in participation among banks (e.g. Ziraat Bankasi, AFD), however their involvement will be analyzed and confirmed by ORKOY during the project implementation phase.</p>
<p>6. The mitigation potential at \$3/t CO2 avoided appears surprisingly cost effective for PV systems. Over 20 years life, it is calculated 1.09 Mt of CO2 is avoided from 30MW total schemes. If the claim is \$3/t avoided total the investment cost is around \$3M. It is not clear what investment cost was selected for the calculation 1 but this equates to \$100 / kW which must be incorrect. The mitigation costs and potential should be reviewed.</p>	<p>The calculation has been corrected during PPG phase, details as follows: The initial assumption is that over 2.5% of all forest villages in Turkey should be able to benefit from the ORKOY soft loans and planning to install or have installed 30MW of solar PV systems by the end of the project resulting in approximately 28,750 tonnes of CO2e being reduced per annum by the end of the project or shortly thereafter. Over a 20 year lifetime of the solar PV systems this works out to approximately 575,000 tonnes of CO2e reduced (28,750 x 20 = 575,000) which represents approximately <b>US \$6.57 of GEF money spent per tonne of CO2 reduced.</b></p>
<p>Turkey: Sustainable Energy Financing Mechanism for Solar PV in Forest Villages in Turkey, GEF ID = 5732 Germany agrees with the comments by STAP on the careful selection of demonstration sites and on the revision of the calculated mitigation cost and potential. - Germany welcomes the formulation of a NAMA to further establish and support the medium term development of solar PV in Turkey. To ensure the successful development of a NAMA, the design of MRV systems and indicators as envisaged under Component 3 needs to be well aligned from the beginning with the NAMA development under</p>	<p>It is still not clear whether or not Turkey is eligible to formulate a NAMA given the unclear status of Turkey under the Kyoto Protocol. UNDP met with the Climate Change Department of the Ministry of Environment and Urbanization to discuss this issue and they advised us to take the development of a NAMA out of the project document and GEF Request for CEO Endorsement. If, at some point in future, Turkey does clearly become eligible for a NAMA then , with the agreement of the Project Board , it may be possible to introduce the activity of preparing a NAMA under the project, However, given the current circumstances, NAMA is out of the revised project.</p>

Component 1. Indicators should not only focus on GHG emissions but also include other nonGHG related aspects such as the progress of the NAMA and potential co-benefits. - Germany would welcome further information on the assigned responsibilities for the development of a NAMA. - Clarification on the amount of co-financing that can be expected from the villages, especially when considering the individual household model and given that forest-villagers are among the poorest of the country, is necessary. - The relation between technical and financial (and other) criteria in the weighing for the selection of pilot sites should be elaborated upon. - Germany suggests involving the Turkish Ministry of Energy in the further process.

**ANNEX C: STATUS OF IMPLEMENTATION OF PROJECT PREPARATION ACTIVITIES AND THE USE OF FUNDS<sup>5</sup>**

A. PROVIDE DETAILED FUNDING AMOUNT OF THE PPG ACTIVITIES FINANCING STATUS IN THE TABLE BELOW:

PPG Grant Approved at PIF: <b>100,000</b>			
<i>Project Preparation Activities Implemented</i>	<i>GEF/LDCF/SCCF/NPIF Amount (\$)</i>		
	<i>Budgeted Amount</i>	<i>Amount Spent To date</i>	<i>Amount Committed</i>
Component A: Baseline Report	7,500	7,500	0
Component B: Stakeholder Consultations Report, Co-financing Letters and Data Coordination	20,000	20,000	0
Component C: Design of Sustainable Energy Financing Mechanism (SEFM)	9,000	9,000	0
Component D: Project Documentation – UNDP Project Document and GEF CEO Endorsement Document & GEF Tracking Tool	36,000	33,000	3,000
Workshops/Miscellaneous/Local Travel	27,500	12,575.5	14,924.5
<b>Total</b>	<b>100,000</b>	<b>82,075.5</b>	<b>17,924.5</b>

<sup>5</sup> If at CEO Endorsement, the PPG activities have not been completed and there is a balance of unspent fund, Agencies can continue undertake the activities up to one year of project start. No later than one year from start of project implementation, Agencies should report this table to the GEF Secretariat on the completion of PPG activities and the amount spent for the activities.

**ANNEX D: CALENDAR OF EXPECTED REFLOWS (if non-grant instrument is used)**

Provide a calendar of expected reflows to the GEF/LDCF/SCCF/NPIF Trust Fund or to your Agency (and/or revolving fund that will be set up)

n/a