

ENÜR SOLAR POWER PLANT BUNDLE PROJECT

Document prepared by

(Enür Enerji Üretim Sanayi ve Ticaret Limited Şirketi)

Project Document Template (Version 1.0)	
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Project Document Template (Version 1.0)	
	<ul style="list-style-type: none">• Orhaneli Elektrik Enerji Üretim Sanayi ve Ticaret Anonim Şirketi• Tabii Kaynaklar Enerji Üretim Sanayi ve Ticaret Anonim Şirketi• Serhat Öztimur
Version	Version 01
Date	12/09/2023
Project type	GHG Project
Grouped project	Grouped Project
Applied methodology	AMS-I.D Small-scale Methodology Grid connected renewable electricity generation Version 18.0
Project location (City, Country)	Bursa, TÜRKİYE
Starting date	19/02/2018
Quantification Period of GHG emissions reductions	19/02/2018 – 18/02/2025 renewable at most twice.

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Estimated total and average annual GHG emission reduction amount	4,887 tCO ₂ /year – 34,209 tCO ₂ /total
Sustainable Development Goals	<p>Goal 7. Ensure access to affordable, reliable, sustainable, and modern energy for all</p> <p>Goal 8. Decent Work and Economic Growth: Promote sustained, inclusive and sustainable economic growth, full and productive employment and decent work for all</p> <p>Goal 9. Build resilient infrastructure, promote inclusive and sustainable industrialization and foster innovation</p> <p>Goal 13. Take urgent action to combat climate change and its impacts</p>
Special category, related to co-benefits	<p>Target 7.2: By 2030, increase substantially the share of renewable energy in the global energy mix.</p> <p>Target 8.5 By 2030, achieve full and productive employment and decent work for all women and men, including for young people and persons with disabilities, and equal pay for work of equal value.</p> <p>Target 9.4: By 2030, upgrade infrastructure and retrofit industries to make them sustainable, with increased resource-use efficiency and greater adoption of clean and environmentally sound technologies and industrial processes, with all countries taking action in accordance with their respective capabilities</p> <p>Target 13.3: Improve education, awareness-raising and human and institutional capacity on climate change mitigation, adaptation, impact reduction and early warning.</p>

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1 Project eligibility

1.1 Scope

Enür Solar Power Plant Bundle Project is a group of five (5) individual unlicensed Photovoltaic Solar Power Plants (SPP) located in boundary of Beleneoluk village, Orhaneli District in Bursa province of Türkiye.¹ The Bundle project activity is a grid-connected electricity generation from renewable source project in the energy sector.

The purpose of the project is to generate electricity energy from renewable sources by using solar power and providing to the Turkish National Grid resulting with GHG emission reduction. The project aims to contribute to mitigate the effects resulted by climate change by reducing 4,887 tCO₂ emission from electricity generation in fossil fuel fired power plants that are displaced due to the project activity.

The scope of the BCR Standard is limited to:	
The following greenhouse gases, included in the Kyoto Protocol: Carbon Dioxide (CO ₂), Methane (CH ₄) and Nitrous Oxide (N ₂ O).	
GHG projects using a methodology developed or approved by BioCarbon Registry, applicable to GHG removal activities and REDD+ activities (AFOLU Sector).	
Quantifiable GHG emission reductions and/or removals generated by the implementation of GHG removal activities and/or REDD+ activities (AFOLU Sector).	
GHG projects using a methodology developed or approved by BioCarbon Registry, applicable to activities in the energy, transportation and waste sectors.	X

¹ Commissioning protocols of power plants

Quantifiable GHG emission reductions generated by the implementation of activities in the energy, transportation and waste sectors.	
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The project is eligible under the scope of the BCR Standard by meeting GHG Projects using a methodology developed or approved by BioCarbon Registry, applicable to activities in the energy, transportation and waste sectors.

1.2 Project type

Activities in the AFOLU sector, other than REDD+

REDD+ Activities

Activities in the energy sector

X

Activities in the transportation sector

Activities related to waste management and disposal

1.3 Project scale

The project is a small-scale, Type I project activity: Renewable energy project activities which have an output capacity up to 15 megawatts (or an appropriate equivalent), in accordance with the CDM rules and requirements.²

2 General description of the project

Enür Solar Power Plant Bundle Project is a group of five (5) individual unlicensed Photovoltaic Solar Power Plants located in Orhaneli District in Bursa province of Türkiye.

² https://cdm.unfccc.int/Reference/Guidclarif/glos_CDM.pdf

The project activity complies with GHG projects with BRC Standard which is an energy sector activity classified as Non-Conventional and Renewable Energy Sources (NCRE).³

The project is proposed to apply Solar Energy obtained from that non-conventional source of renewable that consist of electromagnetic radiation from the sun.⁴

The Bundle project activity is also a grid-connected electricity generation from renewable source project. The project activity includes the installation of solar photovoltaic panels, inverters, transformers and transmission lines to connect to national grid.

Total installed capacity of the project is 4.852MWp/4.250MWe and project is planned to generate 7,539MWh electricity energy annually.⁵

Table 1: List of SPPs (GES) in Enür Solar Power Plant Bundle Project

Name of Bundle		Powerplant Name	Installed Capacity (kWp)	Installed Capacity (kWe)	Date of Commissioning
Enür Solar Power Plant Bundle Project	1	ENÜR SPP	1,140.48	1,000.00	19/02/2018
	2	RENDA SPP	1,140.48	1,000.00	19/02/2018
	3	ORHANELİ SPP	1,140.48	1,000.00	19/02/2018
	4	TABIİ KAYNAKLAR SPP	1,140.48	1,000.00	19/02/2018
	5	SERHAT ÖZTİMUR SPP	290.48	250.00	19/02/2018
		TOTAL	4,852.32	4,250.00	

The purpose of the project is to generate electricity energy from renewable sources by using solar power and providing to the Turkish National Grid. The project activity started to reduce the GHG emissions resulting from the electricity generation for the generation mix of the national grid by supplying the same amount of electricity from the zero-emission solar power generation. The project started to encourage the sustainable development in its region and Country by utilization of solar power potential of Türkiye.

³ Section 10 - https://biocarbonregistry.com/standard/BCR_Standard_en.pdf

⁴ Section 10.1.3 - https://biocarbonregistry.com/standard/BCR_Standard_en.pdf

⁵ EPC Agreement

The project aims to contribute to mitigate the effects caused by climate change by reducing an average 4,887 tCO₂/year and 34,209 tCO₂/total emissions derived from fossil fueled conventional electricity generation in the national grid during the seven (7) years quantification (crediting) period that is renewable at most twice.

The Bundle project has been developed by Enür Enerji Üretim Sanayi ve Ticaret Limited Şirketi on behalf of Bundle companies presented below:⁶

- ENÜR Enerji Üretim Sanayi ve Ticaret Anonim Şirketi
- RENDA Enerji Üretim Danışmanlık Sanayi ve Ticaret A.Ş.
- ORHANELİ Elektrik Enerji Üretim Sanayi ve Ticaret Anonim Şirketi
- TABİİ KAYNAKLAR Enerji Üretim Sanayi ve Ticaret A.Ş.
- SERHAT ÖZTİMUR

The project is operational since February 2018. Project has been installed in accordance with the Turkish Electricity Market Law (Law No: 6446).^{7, 8} In line with Turkish environmental regulations, “Environmental Impact Assessment (EIA) exemption letters”⁹ for each solar power plant were approved by Ministry of Environment, Urbanization and Climate Change.

2.1 GHG Project name

ENÜR SOLAR POWER PLANT BUNDLE PROJECT

2.2 Objectives

Main objectives of the Enür Solar Power Plant Bundle Project include;

- Utilization of the Solar potential of Türkiye to meet increasing electricity demand and maintain energy security.
- Reduction of GHG emissions through increasing share of renewable resources.
- Reduction of import dependency on fossil fuel weighted electricity sector and increase substantially the share of renewable energy in the energy mix.

⁶ Company Registration Certificates

⁷ <https://www.mevzuat.gov.tr/mevzuatmetin/1.5.6446.pdf>

⁸ <https://www.mevzuat.gov.tr/File/GeneratePdf?mevzuatNo=31502&mevzuatTur=KurumVeKurulusYonetmeli&mevzuatTertip=5>

⁹ Copies of EIA exemption letters

- Contribution of economic development by creating job opportunities during construction and operation phases.
- Contribution to sustainable development through supporting local community and local economy. Project is expected to contribute UN Social Development Goals (SDG) 7, 8, 9 and 13.

2.3 Project activities

The project activity is installation of photovoltaic (PV) Solar power plant. Total installed capacity is 4.250MWe/4.852MWp. Photovoltaic Solar systems utilize cells to convert sunlight energy into the electricity energy. The generated electricity energy is transferred to the national grid without any GHG emissions and negative environmental impacts through the technology of PV systems.

The capacity of each power plant and energy generation data are presented in Table 2.

Table 2: Capacity and generation data of each Solar Power Plant

SPP Name	Installed Capacity ¹⁰ (kWp)	Installed Capacity ¹¹ (kWe)	Number of Panel Units ¹²
ENÜR SPP	1,140.48	1,000.00	4,224
RENDA SPP	1,140.48	1,000.00	4,224
ORHANELİ SPP	1,140.48	1,000.00	4,224
TABIİ KAYNAKLAR SPP	1,140.48	1,000.00	4,224
SERHAT ÖZTİMUR SPP	290.48	250.00	1,056
TOTAL	4,852.32	4,250.00	17,952

SOLITEK Solid Pro 270W P.60, model photovoltaic solar panels are used in Enür, Renda, Orhaneli and Tabii Kaynaklar solar power plants of bundle project. UPSOLAR

¹⁰ Data of EPC Agreement

¹¹ Data of EPC Agreement

¹² Data of EPC Agreement

275W PVM60 model photovoltaic solar panels are installed in Serhat Öztimur solar power plant of bundle project. These panels are basically Polycrystalline solar panels with dimension 1645x98x7,1mm. KACO 50.0 TL3 Basic/M/XL model inverters are installed in the project. Details of PV panels and inverters are presented in Table 3.

Table 3: Technical details of solar panels and inverters

SPP Name	PANEL			INVERTER		
	Brand	Model	Unit	Brand	Model	Unit
ENÜR SPP	SOLITEK	Solid Pro 270W P.60	4224	KACO	50.0 TL3 Basic/M/XL	20
RENDA SPP	SOLITEK	Solid Pro 270W P.60	4224	KACO	50.0 TL3 Basic/M/XL	20
ORHANELİ SPP	SOLITEK	Solid Pro 270W P.60	4224	KACO	50.0 TL3 Basic/M/XL	20
TABİİ KAYNAKLAR SPP	SOLITEK	Solid Pro 270W P.60	4224	KACO	50.0 TL3 Basic/M/XL	20
SERHAT ÖZTİMUR SPP	UPSOLAR	PVM 275W	1056	KACO	50.0 TL3 Basic/M/XL	20
TOTAL			17,952			100

2.4 Project location

The Solar Power Plants included in Enür Solar Power Plant Bundle Project are located in region of Belenoluk village, Orhaneli District, Bursa province of Türkiye. The geo-coordinates of the project activity is presented in Table 4.¹³

Table 4: Address & geodetic coordinates of the physical site of the Project Activity

Geodetic coordinates of the physical site of the Enür, Renda, Orhaneli, Tabii Kaynaklar, Serhat Öztimur Solar Power Plants		
Physical address	Latitude	Longitude
ENÜR SPP	39.889964	29.054150
Belenoluk, Orhaneli, Bursa	39°53'23.87"N	29°03'14.94"E

¹³ GPS data included photographs of power plants.

RENDA SPP Belenluk, Orhaneli, Bursa	39.889858 39°53'23.49"N	29.053725 29°03'13.41"E
ORHANELİ SPP Belenluk, Orhaneli, Bursa	39.889958 39°53'23.85"N	29.054908 29°03'17.67"E
TABIİ KAYNAKLAR SPP Belenluk, Orhaneli, Bursa	39.890664 39°53'26.20"N	29.053483 29°03'11.34"E
SERHAT ÖZTİMUR SPP Belenluk, Orhaneli, Bursa	39.892544 39°53'33.16"N	29.053706 29°03'13.34"E

The project location in host country is presented in Figure 1.

Figure 1: Project Location



2.5 Additional information about the GHG Project

N/A

3 Quantification of GHG emissions reduction

3.1 Quantification methodology

The approved CDM methodology AMS-I.D Small-scale Methodology Grid-connected renewable electricity generation (version 18.0) is applied to establish the baseline for the project activity.¹⁴

The type of GHG emission mitigation action is “Renewable energy”, displacement of electricity that would be provided to the grid by more-GHG-intensive means.¹⁵

This methodology refers to the latest approved versions of the following tools those are used in project activity:

- TOOL07: Tool to calculate the emission factor for an electricity system (V7.0)¹⁶
- TOOL21: Demonstration of additionality of small-scale project activities (V13.1)¹⁷
- TOOL27: Investment analysis (Version 11.0)¹⁸
- Guideline: General guidelines for SSC CDM methodologies (Version 23.1)¹⁹

3.1.1 Applicability conditions of the methodology

Enür Solar Power Plant Bundle Project is a photovoltaic solar power type renewable energy generation project that is supplying electricity to a national grid in accordance with scope of the applied methodology.

¹⁴ <https://cdm.unfccc.int/methodologies/DB/W3TINZ7KKWCK7L8WTFQQOFQQH4SBK>

¹⁵ BCR Energy Sector Guide version 1.1 - <https://biocarbonregistry.com/methodologies/BCR-Energy-Sector-Guide.pdf>

¹⁶ <https://cdm.unfccc.int/methodologies/PAMethodologies/tools/am-tool-07-v7.0.pdf>

¹⁷ <https://cdm.unfccc.int/methodologies/PAMethodologies/tools/am-tool-21-v13.1.pdf>

¹⁸ <https://cdm.unfccc.int/methodologies/PAMethodologies/tools/am-tool-27-v12.pdf>

¹⁹ https://cdm.unfccc.int/sunsetcms/storage/contents/stored-file-20210211212225226/MethSSC_Guid25ver23.1.pdf

The project illustrates respective situation under AMS-I.D.: Small-scale Methodology Grid connected renewable electricity generation (version 18) methodology by supplying electricity to a national grid.

Applicability Conditions	Justification status of the Project activity
<p>1. This methodology comprises renewable energy generation units, such as photovoltaic, hydro, tidal/wave, wind, geothermal and renewable biomass:</p> <ul style="list-style-type: none"> (a) Supplying electricity to a national or a regional grid; or (b) Supplying electricity to an identified consumer facility via national/regional grid through a contractual arrangement such as wheeling. 	<p>1. The project activity is a renewable energy generation through photovoltaic units,</p> <p>(a) Supplying electricity to a national or a regional grid</p> <p>Condition is applicable.</p>
<p>2. This methodology is applicable to project activities that:</p> <ul style="list-style-type: none"> (a) Install a Greenfield plant; (b) Involve a capacity addition in (an) existing plant(s); (c) Involve a retrofit of (an) existing plant(s); (d) Involve a rehabilitation of (an) existing plant(s)/unit(s); or (e) Involve a replacement of (an) existing plant(s). 	<p>2. The project activity is installation of a Greenfield plant.</p> <p>Condition is applicable.</p>
<p>3. Hydro power plants with reservoirs that satisfy at least one of the following conditions are eligible to apply this methodology:</p> <ul style="list-style-type: none"> (a) The project activity is implemented in an existing reservoir with no change in the volume of reservoir; (b) The project activity is implemented in an existing reservoir, where the volume of reservoir is increased and the power density of the project activity, as per definitions given in the project emissions section, is greater than 4 W/m²; 	<p>3. Since the project activity is a renewable energy generation through photovoltaic units, this condition is not applicable.</p>

<p>(c) The project activity results in new reservoirs and the power density of the power plant, as per definitions given in the project emissions section, is greater than 4 W/m².</p>	
<p>4. If the new unit has both renewable and non-renewable components (e.g. a wind/diesel unit), the eligibility limit of 15 MW for a small-scale CDM project activity applies only to the renewable component. If the new unit co-fires fossil fuel, the capacity of the entire unit shall not exceed the limit of 15 MW.</p>	<p>4. The project activity units are only renewable components as photovoltaic solar panels, and total installed capacity is 4,250kWe which does not exceed the eligibility limit of 15 MW for a small-scale CDM project activity applies only to the renewable component. Condition is applicable.</p>
<p>5. Combined heat and power (co-generation) systems are not eligible under this category.</p>	<p>5. Since the project activity is a renewable energy generation through photovoltaic units, this condition is not applicable.</p>
<p>6. In the case of project activities that involve the capacity addition of renewable energy generation units at an existing renewable power generation facility, the added capacity of the units added by the project should be lower than 15 MW and should be physically distinct from the existing units.</p>	<p>6. Since the project activity is installation of a Greenfield plant which does not involve the capacity addition of renewable energy generation units at an existing renewable power generation facility, this condition is not applicable.</p>
<p>7. In the case of retrofit, rehabilitation or replacement, to qualify as a small-scale project, the total output of the retrofitted, rehabilitated or replacement power plant/unit shall not exceed the limit of 15 MW.</p>	<p>7. Since the project activity is installation of a Greenfield plant which does not involve the case of retrofit, rehabilitation or replacement, this condition is not applicable.</p>
<p>8. In the case of landfill gas, waste gas, wastewater treatment and agro-industries projects, recovered methane emissions are eligible under a relevant Type III category. If the recovered methane is used for electricity generation for supply to a grid then the baseline for the electricity component shall be in accordance with procedure prescribed under this methodology. If the recovered methane is used for heat generation or cogeneration other applicable Type-I methodologies such as “AMS-I.C.:</p>	<p>8. Since the project activity is a renewable energy generation through photovoltaic solar units which does not involve landfill gas, waste gas, wastewater treatment and agro-industries projects, recovered methane emissions are eligible under a relevant Type III category, this condition is not applicable.</p>

Thermal energy production with or without electricity” shall be explored.	
9. In case biomass is sourced from dedicated plantations, the applicability criteria in the tool “Project emissions from cultivation of biomass” shall apply.	9. Since the project activity is a renewable energy generation through photovoltaic solar units which does not involve biomass is sourced from dedicated plantations, this condition is not applicable.

The assessment of applicability of AMS-I.D Small-scale Methodology Grid-connected renewable electricity generation presents that it is applicable to project activity.

As per applied methodology AMS-I.D Small-scale Methodology Grid-connected renewable electricity generation (version 18.0) refers to TOOL07 for calculation of baseline emissions, compliance to applicability conditions of TOOL07: Tool to calculate the emission factor for an electricity system (Version 7.0)²⁰ is assessed as following:

Applicability Conditions	Justification status of the Project activity
1. This tool may be applied to estimate the OM, BM and/or CM when calculating baseline emissions for a project activity that substitutes grid electricity that is where a project activity supplies electricity to a grid or a project activity that results in savings of electricity that would have been provided by the grid (e.g. demand-side energy efficiency projects).	1. The project activity supplies electricity to a grid (Turkish National Grid) and substitutes grid electricity through supplying renewable energy to grid. Therefore, this tool will be applied to estimate the OM, BM and/or CM when calculating baseline emissions for a project activity. Condition is applicable.
2. Under this tool, the emission factor for the project electricity system can be calculated either for grid power plants only or, as an option, can include off-grid power plants. In the latter case, two sub-options under the step 2 of the tool are available to the project participants, i.e. option IIa and option IIb. If option IIa is chosen, the conditions specified in “Appendix 1: Procedures related to off-	2. The emission factor for the project electricity system is calculated for grid power plants only. Condition is applicable.

²⁰ <https://cdm.unfccc.int/methodologies/PAMethodologies/tools/am-tool-07-v7.0.pdf>

<p>grid power generation” should be met. Namely, the total capacity of off-grid power plants (in MW) should be at least 10 per cent of the total capacity of grid power plants in the electricity system; or the total electricity generation by off-grid power plants (in MWh) should be at least 10 per cent of the total electricity generation by grid power plants in the electricity system; and that factors which negatively affect the reliability and stability of the grid are primarily due to constraints in generation and not to other aspects such as transmission capacity</p>	
<p>3. In case of CDM projects the tool is not applicable if the project electricity system is located partially or totally in an Annex I country</p>	<p>3. The project electricity system is located totally in Türkiye which is not an Annex I country. Condition is applicable.</p>
<p>4. Under this tool, the value applied to the CO2 emission factor of biofuels is zero.</p>	<p>4. The project does not involve biofuels. Condition is not applicable.</p>

The assessment of applicability of TOOL07: Tool to calculate the emission factor for an electricity system (Version 7.0) presents that it is applicable to project activity.

As per applied methodology AMS-I.D Small-scale Methodology Grid-connected renewable electricity generation (version 18.0) rules normative reference to apply “General guidelines for SSC CDM methodologies”, information on additionality.

Guideline rules for demonstrating additionality, as project participants shall refer to the applicable provisions for the demonstration of additionality for small-scale project activities provided in the Project Standard.

The project is developed under rules of BCR Standard Version 3. For projects in the energy and waste sectors, the use of the Clean Development Mechanism tool is required by BCR Standard. TOOL21: Demonstration of additionality of small-scale project activities is opted due to applied methodology as requirement of Standard.

Compliance to applicability conditions of TOOL21: Demonstration of additionality of small-scale project activities (Version 13.1)²¹ is assessed as following:

Applicability Conditions	Justification status of the Project activity
<p>1. The use of the methodological tool “Demonstration of additionality of small-scale project activities” is not mandatory for project participants when proposing new methodologies. Project participants and coordinating/managing entities may propose alternative methods to demonstrate additionality for consideration by the Executive Board.</p>	<p>1. Demonstration of additionality of small-scale project activities is opted to demonstrate additionality of project activity. Condition is applicable.</p>
<p>2. Project participants and coordinating/managing entities may also apply “TOOL19: Demonstration of additionality of microscale project activities” as applicable.</p>	<p>2. Although project scale is acceptable for microscale project activities, project activity does not utilize the rules of Tool 19: Demonstration of additionality of microscale project activities. Condition is not acceptable.</p>
<p>3. Project participants shall follow the applicable provisions for the demonstration of additionality in the CDM Project Standard.</p>	<p>3. Project activity is developed under BCR Standard not CDM Project Standard. Condition is not applicable.</p>
<p>4. This methodological tool refers to the following document: (a) “Non-binding best practice examples to demonstrate additionality for SSC project activities” (EB 35 Annex 34); (b) “TOOL19: Demonstration of additionality of microscale project activities”; (c) “TOOL32: Positive lists of technologies”.</p>	<p>4. (a) “Non-binding best practice examples to demonstrate additionality for SSC project activities” (EB 35 Annex 34); is applied to demonstrate project additionality. Condition is applicable.</p>

²¹ <https://cdm.unfccc.int/methodologies/PAMethodologies/tools/am-tool-21-v13.1.pdf>

<p>5. Project participants shall provide an explanation to show that the project activity would not have occurred anyway due to at least one of the following barriers1:</p> <p>(a) Investment barrier: a financially more viable alternative to the project activity would have led to higher emissions;</p> <p>(b) Technological barrier: a less technologically advanced alternative to the project activity involves lower risks due to the performance uncertainty or low market share of the new technology adopted for the project activity and so would have led to higher emissions;</p> <p>(c) Barrier due to prevailing practice: prevailing practice or existing regulatory or policy requirements would have led to implementation of a technology with higher emissions;</p> <p>(d) Other barriers: without the project activity, for another specific reason identified by the project participant, such as institutional barriers or limited information, managerial resources, organizational capacity, financial resources, or capacity to absorb new technologies, emissions would have been higher.</p>	<p>5. (a) Investment barrier: a financially more viable alternative to the project activity would have led to higher emissions; analysis is applied to demonstrate additionality of project. Condition is applicable.</p>
<p>6. Documentation of barriers, as per paragraph 10 above, is not required for the positive list of technologies and project activity types that are defined as automatically additional for project sizes up to and including the small-scale CDM thresholds (e.g. installed capacity up to 15 MW). For the positive list of technologies, the project proponent shall refer to methodological tool “TOOL32: Positive lists of technologies”.</p>	<p>6. The technology of project activity photovoltaic solar panels are not in the positive list of technologies according to TOOL32. Condition is not applicable.</p>

The assessment of applicability of TOOL21: Demonstration of additionality of small-scale project activities (Version 13.1) presents that it is applicable to project activity.

In order to apply investment analysis to demonstrate additionality of project activity TOOL27: Investment analysis (Version 11.0)²² is applied.

Compliance to applicability conditions of TOOL27: Investment analysis (Version 11.0) is assessed as following:

Applicability Conditions	Justification status of the Project activity
<p>1. This methodological tool is applicable to project activities that apply the methodological tool “Tool for the demonstration and assessment of additionality”, the methodological tool “Combined tool to identify the baseline scenario and demonstrate additionality”, the guidelines “Non-binding best practice examples to demonstrate additionality for SSC project activities”, or baseline and monitoring methodologies that use the investment analysis for the demonstration of additionality and/or the identification of the baseline scenario.</p>	<p>1. The guidelines “Non-binding best practice examples to demonstrate additionality for SSC project activities” is applied. Condition is applicable.</p>
<p>2. In case the applied approved baseline and monitoring methodology contains requirements for the investment analysis that are different from those described in this methodological tool, the requirements contained in the methodology shall prevail.</p>	<p>2. The applied approved baseline and monitoring methodology AMS-I.D.:Grid connected renewable electricity generation (version 18) does not contain requirements for the investment analysis that are different from those described in this methodological tool. Condition is not applicable.</p>

The assessment of applicability of TOOL27: Investment analysis (Version 11.0) presents that it is applicable to project activity.

²² <https://cdm.unfccc.int/methodologies/PAMethodologies/tools/am-tool-27-v12.pdf>

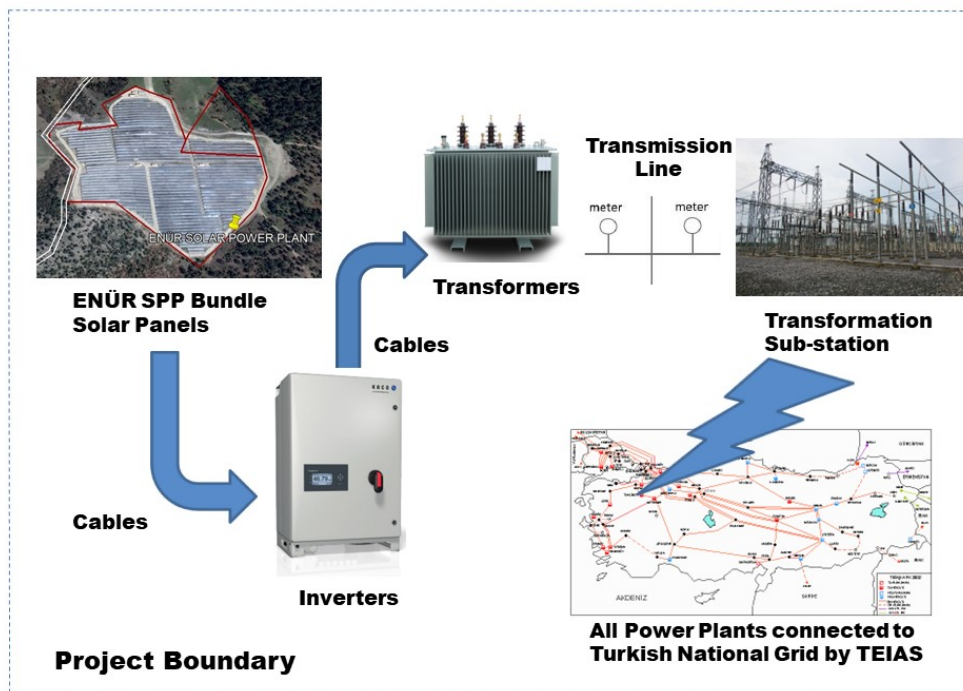
3.2 Project boundaries

3.2.1 Project area

The project boundary is considered as National Electricity Grid of Türkiye according to applied tool. The spatial extent of the project boundary includes the project power plant and all power plants connected physically to the electricity system that the project power plant is connected to.

The geographical and system boundaries for the connected electricity grid can be clearly identified and information on the characteristics of the grid is available.

Figure 2: Project Boundaries



3.2.2 Carbon reservoirs and GHG sources

	Source or reservoir	GHG	Included (Yes/No/Optional)	Justification
Baseline	CO ₂ emissions from electricity generation in fossil fuel fired power plants that are displaced due to the project activity	CO ₂	Yes	Main emission source
		CH ₄	No	Minor emission source
		N ₂ O	No	Minor emission source
Project Activity	For dry or flash steam geothermal power plants, emissions of CH ₄ and CO ₂ from non-condensable gases contained in geothermal steam	CO ₂	No	Not Applicable Project is Solar Source
		CH ₄	No	Not Applicable Project is Solar Source
		N ₂ O	No	Not Applicable Project is Solar Source
	For binary geothermal power plants, fugitive emissions of CH ₄ and CO ₂ from non-condensable gases contained in geothermal steam	CO ₂	No	Not Applicable Project is Solar Source
		CH ₄	No	Not Applicable Project is Solar Source
		N ₂ O	No	Not Applicable Project is Solar Source
	For binary geothermal power plants, fugitive emissions of hydrocarbons such as n-butane and isopentane (working fluid) contained in the heat exchangers	Low GWP hydrocarbon/ refrigerant	No	Not Applicable Project is Solar Source
	CO ₂ emissions from combustion of fossil fuels for electricity generation in solar thermal power plants and geothermal power plants	CO ₂	No	Not Applicable Project is Solar Source
		CH ₄	No	Not Applicable Project is Solar Source
		N ₂ O	No	Not Applicable Project is Solar Source
	For hydro power plants, emissions of CH ₄ from the reservoir	CO ₂	No	Not Applicable Project is Solar Source
		CH ₄	No	Not Applicable Project is Solar Source
N ₂ O		No	Not Applicable Project is Solar Source	

3.2.3 Time limits and periods of analysis

Project start date

The start date for project activity is 19/02/2018 that result in actual reductions/removals of GHG emission begins.

Quantification period of the GHG emissions reduction

The quantification period of the project will cover a period of seven (7) years starting from the project start date of 19/02/2018 until 18/02/2025, with the potential to be renewed two (2) times.

- (a) Each renewable crediting period shall be at most seven years and may be renewed at most two times, for a maximum total length of 21 years;

The option (a) which is stated paragraph 87, article 7.6 of CDM project standard for project activities version 03.0 is opted for project activity.²³

Monitoring periods

The first monitoring period of the project will cover dates between 19/02/2018 and 31/12/2022. The second monitoring period of the project will cover dates between 01/01/2023 and 18/02/2025. Future monitoring periods will be determined due to renewal of next quantification periods.

3.3 Identification and description of baseline scenario

The approved CDM methodology AMS-I.D version 18.0 Small-scale Methodology Grid-connected renewable electricity generation is applied to establish the baseline for the project activity.²⁴

The project activity is installation of Greenfield power plant. "The baseline scenario for Greenfield power plant is that the electricity delivered to the grid by the project activity

²³ https://cdm.unfccc.int/sunsetcms/storage/contents/stored-file-20210921115752577/reg_stan04_v03.0.pdf

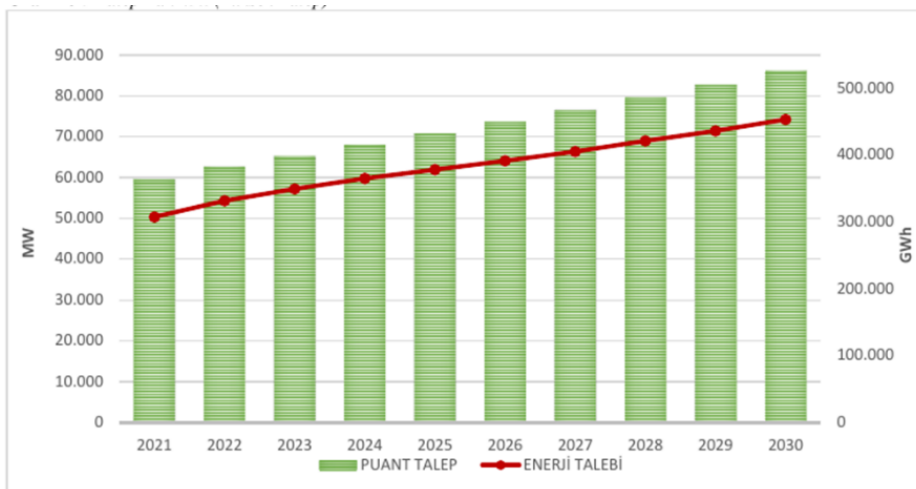
²⁴ <https://cdm.unfccc.int/methodologies/DB/W3TINZ7KKWCK7L8WTXFQQOFQQH4SBK>

would have otherwise been generated by the operation of grid-connected power plants and by the addition of new generation sources into the grid.”²⁵

Turkish Electricity Grid is dominantly served by thermal power plants, resulting in greenhouse gas emissions. The energy statistics published by the TEIAS (Turkish Electricity Transmission Company), indicates that Türkiye has a total electricity generation of 306,703GWh which, 57.7% is thermal, 42.3% is all types of renewable generation by end of year 2020.²⁶

Since Türkiye is an advanced developing country, demand for electricity is very high depending on economic development and population increase. However, development of renewable energy resources and investment are lower than increasing number of thermal power plants. The infrastructure development of natural gas pipelines encourages the natural gas power plants. The economic policy to utilize domestic lignite resources also promotes the coal fired thermal power plant investments that will cause increase in GHG emissions. Peak Load and consumption projection for Turkish electricity system between 2021 and 2030 is presented in Figure 2.

Figure 3: Peak Load and consumption projection for Turkish electricity system



²⁵ <https://cdm.unfccc.int/methodologies/DB/W3TINZ7KKWCK7L8WTFQOQFQQH4SBK>

²⁶ Latest available “Capacity Projection Report by TEIAS 2021-2025,
<https://www.epdk.gov.tr/Detay/Icerik/3-0-66/elektrikuretim-kapasite-projeksiyonlari#>

In other words, the baseline scenario is the existing electricity generation prior to the implementation of the project. In case the project activity has not been implemented, it was assumed that the same amount of electricity would be generated from mostly thermal power plants connected to the grid.

3.4 Additionality

In line with Project Standard, for projects in energy and waste sectors, the use of the Clean Development Mechanism tool is required to establish the project additionality.

The approved CDM methodology AMS-I.D Small-scale Methodology Grid-connected renewable electricity generation (version 18.0) is applied to establish the baseline for the project activity. The normative references of applied methodology refer to project participants shall apply the “General guidelines for SSC CDM methodologies, information on additionality.”²⁷

As per Guidelines on TOOL21: Demonstration of additionality of small-scale project activities (Version 13.1)²⁸ and, it has to be provided an explanation to show that the project activity would not have occurred anyway due to at least one of the following barriers:

- (a) **Investment barrier:** a financially more viable alternative to the project activity would have led to higher emissions;
- (b) **Technological barrier:** a less technologically advanced alternative to the project activity involves lower risks due to the performance uncertainty or low market share of the new technology adopted for the project activity and so would have led to higher emissions;
- (c) **Barrier due to prevailing practice:** prevailing practice or existing regulatory or policy requirements would have led to implementation of a technology with higher emissions;
- (d) **Other barriers:** without the project activity, for another specific reason identified by the project participant, such as institutional barriers or limited information, managerial resources, organizational capacity, financial resources, or capacity to absorb new technologies, emissions would have been higher.

²⁷ https://cdm.unfccc.int/Reference/Guidclarif/ssc/methSSC_guid15_v01.pdf

²⁸ <https://cdm.unfccc.int/methodologies/PAMethodologies/tools/am-tool-21-v13.1.pdf>

The most significant barrier is identified as the investment barrier according to context of the project activity to demonstrate in a conservative and transparent manner that the proposed project activity is financially attractive or unattractive.

Best practice examples of Investment analysis is defined as:

“Best practice examples include but are not limited to, the application of investment comparison analysis using a relevant financial indicator, application of a benchmark analysis or a simple cost analysis (where CDM is the only revenue stream such as end-use energy efficiency). It is recommended to use national or global accounting practices and standards for such an analysis according to non-binding best practice examples to demonstrate additionality for SSC project activities to demonstrate additionality of the project activity”²⁹

The investment analysis is applied by using TOOL27-Investment analysis (Version 11.0)³⁰ to evaluate financial status of the project activity to discuss Investment barrier. The steps of “Tool for demonstration and assessment of Additionality”³¹ utilized in order to determine method of financial analysis.

The alternative to the project activity undertaken without being registered as a BCR (CDM) project activity could be a realistic option since it is already installed although the project is not feasible without carbon credit finance are deemed as a realistic scenario.

Step 2: Investment analysis

Determine whether the proposed project activity is economically or financially less attractive than at least one other alternative, identified as a realistic scenario, without the revenue from the sale of emission reductions credits. To conduct the investment analysis, use the following sub-steps:

Sub-step 2.a: Determine appropriate analysis method

Simple Cost Analysis is not applicable since the project obtains revenue from the sale of generated electricity. Investment Comparison Analysis is also not applicable since the

²⁹ https://cdm.unfccc.int/Reference/Guidclarif/ssc/methSSC_guid15_v01.pdf

³⁰ <https://cdm.unfccc.int/methodologies/PAmethodologies/tools/am-tool-27-v12.pdf>

³¹ <https://cdm.unfccc.int/methodologies/PAmethodologies/tools/am-tool-01-v7.0.0.pdf>

baseline of the project is generation of electricity energy by Turkish grid and no alternative investment is point at issue.

Sub-step 2b (Option III): Apply benchmark analysis

Benchmark Analysis option has been selected for the assessment of the project investment as the most proper method. The financial indicator of project activity is determined as post-tax equity IRR in-line with the Sub-step 2b.

Determination of Benchmark Indicator:

At the time of investment decision date, the methodological TOOL27: Investment Analysis (Version 6) was the latest available for project proponent.

In line with Sub-step 2b, article 38 (b) of “Tool for demonstration and assessment of Additionality, benchmark rate has been derived from “World Bank Report”³² published in 2017 indicates that **25%** for equity IRR for similar PV Solar Energy generation projects in Türkiye as “commercial lending rate”. It has been taken from World Bank Loan provided to Turkish Renewable Energy Sector within the scope of clean technology (CTF) fund. It is clearly stated in report (Annex 3, pp 39-41) that the desired thresholds were assessed as 15 percent for small hydro, 20 percent for biomass, and 25 percent for “Solar Project Energy Investments” in Türkiye. Threshold IRRs have been determined for each type of projects which are the minimum, conservative and reliable IRRs to attract investors.

“It was assessed at appraisal that, for newer RE (renewable energy) technologies and EE (energy efficiency) investments, and for smaller-scale hydro and wind projects, financial barriers existed which reduced the rates of return on equity (IRR) below the levels required to attract investors. The desired thresholds were assessed as follows: 15 percent for small hydro, 20 percent for biomass, and 25 percent for solar.”³³

³² Annex 3-Economic and Financial Analysis, Table 3.3-Prototype Sub-projects for CTF Financing, pp 40
<https://documents1.worldbank.org/curated/en/799701498842988254/pdf/ICR00004069-06192017.pdf>

³³ <https://documents1.worldbank.org/curated/en/799701498842988254/pdf/ICR00004069-06192017.pdf>

Sub-step 2c: Calculation and comparison of financial indicators

The main parameters used for investment analysis are presented in Table 5 below. Time of the investment decision is accepted as the date of technical EPC agreement with contractor which is the earliest of the dates at which the implementation or construction or real action of the project activity begins. Installed capacity is derived from technical EPC agreement. Projected amount of generation is calculated according to plant load factor PLF provided by third party company as 20.27%.

Investment cost is derived from “World Bank Report”³⁴ published on June 2017 indicates that lowest data 1,423 US\$/kW per kW of capacity installed as conservative cost value whereas it was 1,570 US\$/kW per kW in IRENA³⁵ cost data. Operation and Maintenance cost is derived from “Renewable Power Generation Costs in 2021 report”³⁶ published in 2022 by IRENA – International Renewable Energy Agency indicating 21.5 US\$ per kW/year in 2017 for PV projects in OECD Countries that includes Türkiye.

Electricity tariff is received from “#5346: Law on Utilization of Renewable Energy Sources for The Purpose of Generating Electrical Energy”³⁷ published on 10/05/2005 indicates that 13.3 ct/kWh for ten (10) years after commissioning.

The market price after ten (10) years is accepted as 6.3ct/kWh according to average market price for electricity energy generation derived from last 4 years (2013-2016) average market price³⁸ from EPIAS³⁹ Energy Markets Operator Company records which was latest data available at the time of investment decision.

³⁴ Annex 3-Economic and Financial Analysis, Table 3.4- Investment Cost per kW of Capacity Installed (US\$/kW) for all 53 RE Sub-projects by Category, pp 41

<https://documents1.worldbank.org/curated/en/799701498842988254/pdf/ICR00004069-06192017.pdf>

³⁵ <https://www.irena.org>

³⁶ Table A1.4 - https://www.irena.org/-/media/Files/IRENA/Agency/Publication/2022/Jul/IRENA_Power_Generation_Costs_2021.pdf?rev=34c22a4b244d434da0accde7de7c73d8

³⁷ Table: “I Sayılı Cetvel”, pp 10 <https://www.mevzuat.gov.tr/MevzuatMetin/1.5.5346.pdf> and also

<https://www.epdk.gov.tr/Detay/DownloadDocument?id=5TsScgaXpeE=>

<https://www.epdk.gov.tr/Detay/Icerik/1-1270/electricityelektricity-legislation>

³⁸ <https://seffaflik.epias.com.tr/transparency/piyasalar/gop/ptf.xhtml>

³⁹ <https://seffaflik.epias.com.tr/transparency/about.xhtml>

Table 5: Parameters of Investment Analysis

Parameters	Data Value	Unit	Reference
Technical Data			
Installed Capacity	4.250	MWe	EPC Agreement data
Plant Load Factor	20.25%	%	Third party contracted
Projected Generation	7,539	MWh/year	Calculated value
Average Annual Emission Reduction	4,887	tCO ₂ /year	Calculated value
Financial Data			
Feed in Tariff	13.3	ct/kWh	https://www.mevzuat.gov.tr/Mevzuat/Metin/1.5.5346.pdf
Market Price after 10 years	6.3	ct/kWh	https://seffaflik.epias.com.tr/transparency/piyasalar/gop/ptf.xhtml
Expected ACCs price	4.00	USD/tCO ₂	VER price assumption
Corporate Tax rate	20	%	Official record of Republic of Türkiye, Ministry of Treasury and Finance, Revenue Administration ⁴⁰
Project Cost and Financing Model			
Investment Cost	6,904,396	USD	Calculated Value ⁴¹
EM Revision Cost	1,308,879	USD	Calculated Value
O&M Cost	2,607,950	USD	Calculated Value ⁴²
Debt / Equity	50%	%	Tool 27 ⁴³

⁴⁰ https://www.gib.gov.tr/fileadmin/user_upload/Yararli_Bilgiler/KV_Oranlari.html
https://www.gib.gov.tr/sites/default/files/fileadmin/taxation_system2021.pdf

⁴¹ Annex 3-Economic and Financial Analysis, Table 3.4- Investment Cost per kW of Capacity Installed (US\$/kW) for all 53 RE Sub-projects by Category, pp 41
<https://documents1.worldbank.org/curated/en/799701498842988254/pdf/ICR00004069-06192017.pdf>

⁴² Table A1.4 - https://www.irena.org/-/media/Files/IRENA/Agency/Publication/2022/Jul/IRENA_Power_Generation_Costs_2021.pdf?rev=34c22a4b244d434da0accde7de7c73d8

⁴³ <https://cdm.unfccc.int/methodologies/PAMethodologies/tools/am-tool-27-v12.pdf>

Interest rate on loan	12%	%	Official data ⁴⁴
Period of assessment of financial analysis	25	years	

Equity Internal Rate of Return (IRR) of the Enür Solar Power Plant Bundle Project has been calculated as 9.44% based on applied parameters without considering the carbon emission reduction revenue. Investment analysis shows that calculated equity IRR of project is below the Benchmark 25% value without carbon revenue.

Variable	W/O VER	With VER	Relative Improvement
Equity IRR after Tax	9.44%	9.91%	4.94%*

The carbon revenue will improve the project's financial indicator equity IRR at least 4.94% relatively and encourage investors to maintain projects and further developments.

Sub-step 2d: Sensitivity Analysis

Sensitivity analysis has been assessed out of three main parameters. The change in Operation and Maintenance cost and Energy price could be main variables to test sensitivity analysis. The calculation of analysis shows that any of the variables do not result in a substantial change in equity IRR in order to catch the benchmark value.

Table 6: Sensitivity Analysis without carbon revenue

IRR Calculation	-10.00%	-5.00%	0.00%	5.00%	10.00%
Total Project Cost	12.22%	10.71%	9.45%	8.35%	7.40%
O&M Cost	9.70%	9.57%	9.45	9.32%	9.19%
PLF - Generation	7.72%	8.59%	9.45%	10.29%	11.12%
Energy Price	7.72%	8.59%	9.45%	10.29%	11.12%
Benchmark IRR	25.00%	25.00%	25.00%	25.00%	25.00%

⁴⁴ https://www.sbb.gov.tr/wp-content/uploads/2018/11/2017_TemelEkonomikGostergeler.zip

Probability to surpass the benchmark:

Total Project Cost:

Project cost for financial analysis is derived from unit cost for install power per kW from “World Bank Report”⁴⁵ which was available at the time of investment decision making to proceed. It is the bottom unit cost as conservative cost value from real world instances. Nevertheless, the sensitivity is applied for 10% variation for threshold level below that benchmark is not exceeded. It needs to be 31.15% below variation for threshold level to reach benchmark therefore it is unlikely that total project cost will change beyond sensitivity range.

O&M Cost:

Operation and Maintenance cost is derived from unit cost for install power per kW from “Renewable Power Generation Costs in 2021 report”⁴⁶ by IRENA – International Renewable Energy Agency indicating 21.5 US\$ per kW/year in 2017 for PV projects in OECD Countries that includes Türkiye. Since the O&M cost is generally under effect of inflation, it is more like to increase rather than to be decreased. It does not match the benchmark even gets 100% below variation for threshold level. Hence, the reduction in the O&M cost is unlikely.

PLF - Generation:

Generation amount based on PLF is considered in financial analysis as per third party data in line with “Guidelines for the reporting and validation of Plant load factors” stated in EB 48 Annex11 option 3(b). Hence, variation in PLF of more than 10% is unlikely to happen since the PLF data provided by the Third Party Letter based on Solar energy potential of project site on earth which is also unlikely to change beyond the sensitivity range. It needs to be 101% above variation for

⁴⁵ Annex 3-Economic and Financial Analysis, Table 3.4- Investment Cost per kW of Capacity Installed (US\$/kW) for all 53 RE Sub-projects by Category, pp 41
<https://documents1.worldbank.org/curated/en/799701498842988254/pdf/ICR00004069-06192017.pdf>

⁴⁶ Table A1.4 - https://www.irena.org/-/media/Files/IRENA/Agency/Publication/2022/Jul/IRENA_Power_Generation_Costs_2021.pdf?rev=34c22a4b244d434da0accde7de7c73d8

threshold level to reach benchmark therefore it is unlikely that PLF will change beyond sensitivity range.

Tariff – Energy Price:

The tariff is fixed for ten years after the start date of project activity and accepted as average of market price from last four years from EPIAS Energy Markets Operator Company records which was latest data available at the time of investment decision for remaining period of project lifetime. Hence, there is no probability to get huge variation it is unlikely that Tariff change beyond the sensitivity range. However, Sensitivity is carried out for +/-10% even then the benchmark is not exceeded.

Outcome of Step 2:

Based on the analysis presented in Table 6, the variation percentage required to meet the benchmark is extremely large and unlikely. It is clear that project is not the most financially/economically attractive option. Therefore, the project is considered as additional to the baseline scenario.

3.5 Uncertainty management

The data used for quantification of baseline values are mainly derived from Turkish Grid emission factor and estimation of quantification of project activity generation values.

The emission factor considered to calculate emission reductions is officially published on 07/10/2021 by Ministry of Energy and Natural Resources on “Türkiye National Network Emission Factor Data Sheet” which is latest publicly available data.^{47 48}

The emission factor is indicating National Electricity Grid emission factor for the year 2019 that includes Operating Margin (OM), Build Margin (BM) and Combined Margin (CM) Emission Factors calculated by using TOOL 07 – V06.0.

⁴⁷ <https://enerji.gov.tr/duyuru-detay?id=195>

⁴⁸

https://enerji.gov.tr/Media/Dizin/BHIM/tr/Duyurular//Bilgi_Formu_Web_Sitesi_2019_202110071443.pdf

The quantification of projected generation values of project activity is mainly derived from installed power and plant load factor (PLF). Project activity is installation of a Solar photovoltaic power plant. Install power values of Solar photovoltaic panels are fixed and appearing increase in system loss by years. PLF is provided by third party company calculated under the consideration of maximum Solar potential of project site and install powers of solar panels.

The quantification of net project generation is recorded by sealed meters, cross checked by backup meters which are located at sub-station connection to the national grid. Authorization of recording and servicing of meters is controlled by distribution company UEDAŞ Uludağ Elektrik Dağıtım A.Ş.

3.6 Leakage and non-permanence

Project emission for Solar power plant is accepted as zero by Methodology which is real world case too.

Project Leakage is also accepted as zero since it does not use any type of fossil fuel sources for its generation and operations.

3.7 Mitigation results

3.7.1 Eligible areas in the GHG project boundary (if applicable)

The project activity is not an AFOLU hence it is not applicable.

3.7.2 Stratification (if applicable)

The project activity is not an AFOLU hence it is not applicable.

3.7.3 GHG emission reductions in the baseline scenario

The baseline of project activity is described in accordance with the approved CDM methodology AMS-I.D Small-scale Methodology Grid-connected renewable electricity generation (version 18.0)⁴⁹ hence it is an installation of a Greenfield power plant, using renewable energy sources and supplying electricity to a national grid, in line with the eligibility limit of 15 MW for a small-scale CDM project activity definition.

⁴⁹ <https://cdm.unfccc.int/methodologies/DB/W3TINZ7KKWCK7L8WTXFQQOFQQH4SBK>

Baseline emissions include only CO₂ emissions from electricity generation in power plants that are displaced due to the project activity. The methodology assumes that all project electricity generation above baseline levels would have been generated by existing grid-connected power plants and the addition of new grid-connected power plants. The baseline emissions are to be calculated as follows:

$$BE_y = EG_{PJ,y} \times EF_{grid,y} \quad \text{Equation (1)}$$

Where:

- BE_y = Baseline emissions in year y (t CO₂)
- $EG_{PJ,y}$ = Quantity of net electricity generation that is produced and fed into the grid as a result of the implementation of the CDM project activity in year y (MWh)
- $EF_{grid,y}$ = Combined margin CO₂ emission factor for grid connected power generation in year y calculated using the latest version of the “Tool to calculate the emission factor for an electricity system” (t CO₂/MWh)

Since the project activity is the installation of a greenfield power plant, $EF_{grid,y}$ is to be calculated as follows:

$$EG_{PJ,y} = EG_{PJ,facility,y} \quad \text{Equation (2)}$$

Where:

- $EG_{PJ,facility,y}$ = Quantity of net electricity generation supplied by the project plant/unit to the grid in year y (MWh)

The emission factor has been calculated in a transparent and conservative manner as a combined margin (CM), consisting of the combination of operating margin (OM) and build margin (BM) according to the procedures prescribed in the “TOOL07: Tool to calculate the emission factor for an electricity system”⁵⁰

⁵⁰ <https://cdm.unfccc.int/methodologies/PAMethodologies/tools/am-tool-07-v6.pdf>

The emission factor considered to calculate emission reductions is officially published on 07/10/2021 by Ministry of Energy and Natural Resources on “Turkish National Network Emission Factor Data Sheet” which is latest publicly available data.^{51 52}

The emission factor is indicating National Electricity Grid emission factor for the year 2019 that includes Operating Margin (OM), Build Margin (BM) and Combined Margin (CM) Emission Factors calculated by using TOOL 07 – V06.0.

The data set used for calculation is declared as follows:

1. TEİAŞ (Turkish Electricity Transmission Corporation) electricity generation-consumption and loss statistics of Türkiye.
2. Common Reporting Format with Türkiye’s National Greenhouse Gas Inventory Reporting – The emission value stated in electricity generation (1.A.1.a.i) in the tables of Common Reporting Format (CRF)
3. Chronologic order according to commissioning dates of electricity generation plants, plant names, fuel types, installed powers data, amount of electricity generation for the calculation year
4. The status of Voluntary Emission Reductions (VER) ownership by web-sites of Gold Standard (GS) and Verified Carbon Standard (VCS).
5. Efficiency values has been derived from Clean Development Mechanism (CDM) Tool 009-V2.0.⁵³

Calculation of the Operating Margin Emission Factor:

Based on above data set, Turkish Ministry of Energy and Natural Resources calculated *EF_{grid,OM,y}* as 0.7258 tCO₂/MWh.

Published as 0.7258 tCO₂/MWh for OM

⁵¹ <https://enerji.gov.tr/duyuru-detay?id=195>

⁵²

https://enerji.gov.tr/Media/Dizin/BHIM/tr/Duyurular//Bilgi_Formu_Web_Sitesi_2019_202110071443.pdf

⁵³ <https://cdm.unfccc.int/methodologies/PAMethodologies/tools/am-tool-09-v3.0.pdf>

Calculation of the Build Margin Emission Factor:

Based on above data set, Turkish Ministry of Energy and Natural Resources calculated $EF_{grid,BM,y}$ as 0.41153 tCO₂/MWh.

Published as **0.4153 tCO₂/MWh** for BM

Calculating of the Combined Margin Emission Factor:

The combined margin emission factor is calculated by using weighted average CM as per Tool 07 formula presented below:

$$EF_{grid,CM,y} = EF_{grid,OM,y} \times W_{OM} + EF_{grid,BM,y} \times W_{BM} \quad \text{Equation (16)}$$

Where:

$EF_{grid,BM,y}$ = Build margin CO₂ emission factor in year y (t CO₂/MWh)

$EF_{grid,OM,y}$ = Operating margin CO₂ emission factor in year y (t CO₂/MWh)

W_{OM} = Weighting of operating margin emissions factor (per cent)

W_{BM} = Weighting of build margin emissions factor (per cent)

As per Tool 07 rules, default values for Wind and Solar power generation project activities: $W_{OM} = 0.75$ and $W_{BM} = 0.25$ (owing to their intermittent and non-dispatchable nature) for the first crediting period and for subsequent crediting periods.

Hence, CM calculation equal to $CM = (0.7258 \times 0.75) + (0.41.53 \times 0.25)$

Published as **0.6482 tCO₂/MWh** for CM

Calculation of Emission Reductions

According to AMS-I.D Small-scale Methodology Grid-connected renewable electricity generation methodology, emission reductions related to project activities is estimated as follows:

$$ER_y = BE_y - PE_y - LE_y$$

Equation (9)

where

ER_y	=	Emission reductions in year y (t CO ₂)
BE_y	=	Baseline Emissions in year y (t CO ₂)
PE_y	=	Project emissions in year y (t CO ₂)
LE_y	=	Leakage emissions in year y (t CO ₂)

Project emissions

In reference to Methodology for most renewable energy project activities, $PE_y = 0$. However, for the following categories of project activities, project emissions have to be considered following the procedure described in the most recent version of “ACM0002: Grid-connected electricity generation from renewable sources”:

- (a) Emissions related to the operation of geothermal power plants (e.g. non-condensable gases, electricity/fossil fuel consumption);
- (b) Emissions from water reservoirs of hydro power plants.

However, in case biomass is sourced from dedicated plantations, the procedures in the tool “Project emissions from cultivation of biomass” shall be used.

CO₂ emissions from on-site consumption of fossil fuels due to the project activity shall be calculated using the latest version of the “Tool to calculate project or leakage CO₂ emissions from fossil fuel combustion”.

The project activity is generation of electricity energy by Solar Power Plants and not related to any types of geothermal, hydro and biomass resources. The applied technology is environment friendly photovoltaic panels and converters that converts solar energy into electrical energy, hence there are no GHG emission associated with the project activity. There is no on-site consumption of fossil fuels due to the project activity.

Hence Project Emissions are accepted as zero.

$$PE_y = 0$$

Leakage

The project activity is a greenfield investment and installed equipment is not transferred from another activity. Leakage emissions are accepted as zero.

$$LE_y = 0$$

Finally, Net GHG Emission Reductions and Removals are calculated as:

Emission reduction is calculated as $ER_y = BE_y$ (tCO₂)

3.7.4 GHG emission reductions in the project- scenario

The baseline emission is calculated as the net electricity generated by the project activity, multiplied with the baseline emission factor of the project grid in accordance with AMS-I.D Small-scale Methodology Grid-connected renewable electricity generation methodology (version 18)

$$BE_y = (7,539) \times (0,6482) = 4,887 \text{ tCO}_2/\text{year}$$

Total emission reduction is considered as $ER_y = BE_y = 4,887 \text{ tCO}_2/\text{year}$

Year	GHG emission reductions in the baseline scenario (tCO _{2e})	GHG emission reductions in the project scenario (tCO _{2e})	GHG emissions attributable to leakages (tCO _{2e})	Estimated Net GHG Reduction (tCO _{2e})
19/02/2018-31/12/2018	4,231	4,231	0	4,231
2019	4,887	4,887	0	4,887
2020	4,887	4,887	0	4,887
2021	4,887	4,887	0	4,887
2022	4,887	4,887	0	4,887
2023	4,887	4,887	0	4,887
2024	4,887	4,887	0	4,887
01/01/2025-18/02/2025	656	656	0	656

Total	34,209	0	0	34,209
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4 Compliance with applicable legislation

Project activity has been developed in line with following legislation and regulations.

- # 6446 Electricity Market Law⁵⁴
(Ratification date: 14/03/2013 - Enactment date: 30/03/2013)
- # 5346 Law on Utilization of Renewable Energy Resources for the Purpose of Generating Electricity Energy⁵⁵
(Ratification date: 10/05/2005 – Enactment date: 18/05/2005)
- # 2872 Environment Law⁵⁶
(Ratification date: 09/08/1983 – Enactment date: 11/08/1983)
- # 6831 Forest Law⁵⁷
(Ratification date: 31/08/1956 – Enactment date: 08/09/1956)
- By-Law on EIA Environmental Impact Assessment Regulation^{58,59}
(Enactment dates: 25/11/2014 and 29/07/2022 - Official Gazette Issues: 29186 and 31907 authored by Ministry of Environment, Urbanization and Climate Change)

Project team have access to check on an ongoing basis to relevant legislation and regulations periodically.

⁵⁴ <https://www.mevzuat.gov.tr/mevzuatmetin/1.5.6446.pdf>

⁵⁵ <https://www.mevzuat.gov.tr/mevzuatmetin/1.5.5346.pdf>

⁵⁶ <http://www.mevzuat.gov.tr/MevzuatMetin/1.5.2872.pdf>

⁵⁷ <https://www.mevzuat.gov.tr/mevzuatmetin/1.3.6831.pdf>

⁵⁸ <https://www.resmigazete.gov.tr/eskiler/2014/11/20141125-1.htm>

⁵⁹ <https://www.mevzuat.gov.tr/mevzuat?MevzuatNo=39647&MevzuatTur=7&MevzuatTertip=5>

5 Carbon ownership and rights

5.1 Project holder

Individual or organization	ENÜR Enerji Üretim Sanayi ve Ticaret Anonim Şirketi
Contact person	Mr. Serhat Öztimur
Position	Owner
Address	Konak Mah. Yıldırım Cad. Tomurcuk Sok. No:3 Nilüfer BURSA TÜRKİYE
Phone number	Landline: +902242212192
Email	

5.2 Other project participants

Individual or organization	ENÜR Enerji Üretim Sanayi ve Ticaret Anonim Şirketi
Contact person	Mr. Abdurrahman Zengin
Position	Project Coordinator – Contact Person
Address	Konak Mah. Yıldırım Cad. Tomurcuk Sok. No:3 Nilüfer BURSA TÜRKİYE
Phone number	Cell phone: +905323540751 Landline: +902242212192
Email	abdurrahman.zengin@oztimur.com.tr

Individual or organization	GLOBIA Çevre Yatırım Danışmanlık ve Mühendislik San. Tic. Ltd. Şti.
Contact person	Mr. Bülent Birol
Position	Managing Director – Contact Person Consultant for GHG Emission Reduction Project
Address	Atatürk Mah. Ertuğrul Gazi Sk. Metropol İstanbul C1 Blok No:2/B İç Kapı No:376 Ataşehir İSTANBUL TÜRKİYE
Phone number	Cell phone: +905323145185
Email	bulent.biol@globia.com.tr

5.3 Agreements related to carbon rights

Project activity has been developed on private property owned by project proponent not within the territories of ethnic groups and/or local traditional communities.⁶⁰ Hence Carbon ownership and rights are only assigned to project proponent ENÜR Enerji Üretim Sanayi ve Ticaret Anonim Şirketi.

5.4 Land tenure (if applicable)

The project activity is not an AFOLU hence it is not applicable.

6 Climate change adaptation

Not applicable for GHG Emission Reduction projects.

⁶⁰ Land register of private property.

7 Risk management

The risk assessment was carried out before installation and at operation phases for the environmental, financial and social dimensions for the purpose of indicating the risks and mitigations related to the implementation of the project activities.

Identified risks and defined mitigations are presented below:

Risk Category	Identified Risks	Mitigation Measures
Environmental	Ecosystem protection issues	<ul style="list-style-type: none"> Maintain recycling and disposal of solid waste in line with national regulation in order to protect ecosystem.
	Environmental Externalities	<ul style="list-style-type: none"> Keep active protection for negative weather conditions
	Occupational Health and Safety issues	<ul style="list-style-type: none"> Promote trainings on occupational health care, sanitation and precaution and supports to access health services.
Financial	Potential Power Price changes	<ul style="list-style-type: none"> Payment guarantee mechanisms is available for ten years. Market price will be applied after ten years.
	Human Resource Risk	<ul style="list-style-type: none"> Availability of skilled technicians and engineers are very less in solar energy projects on site in Bursa province.
Social	Negative perception for energy generation projects	<ul style="list-style-type: none"> Keep and improve education, awareness-raising of local people on advantages and aspects of Solar PV Power facilities supporting climate change mitigation, adaptation, impact reduction and early warning

7.1 Reversal risk management

Project activity has a connection agreement with official distribution company (UEDAŞ) which provides offset the reversal risk for identified financial risks through energy price and payment guarantee mechanisms.

Project proponent will apply a risk management plan for environmental and social risks with monitoring plan correspondingly.

8 Environmental Aspects

The project complies with the relevant regulations and laws including Electricity Market Law with Number 6446 dated 14/3/2013 and Law on Utilization of Renewable Energy Resources for the Purpose of Generating Electrical Energy with Number 5346 and dated 18/05/2005 which are base legal framework for energy sector in Türkiye.

Project activity is considered as out of “Environmental Impact Assessment (EIA) application” in accordance with Environment Law with Number 2872 dated 11/8/1983, and By-law on Environmental Impact Assessment dated 25/11/2014 and updated 29/07/2022 by the Ministry of Environment and Urbanization for every plant in this bundled project.

However, the following environmental aspects have been discussed as the foreseeable effects on biodiversity and ecosystems within the project boundaries.

Element	Air
Foreseeable effects	Any types of GHG Emission pollution
Estimated Change	Positive
Justification	Project activity is power generation from Solar energy by using photovoltaic panels. Hence operation of project activity does not result any type of GHG emission.

Element	Land
Foreseeable effects	Solid waste Pollution from plastics, hazardous wastes, bio-medical wastes, chemicals, e-wastes, batteries, end-of-life products/equipment

Estimated Change	Positive
Justification	Project activity does not produce any types of solid waste from plastics, bio-medical, chemical, hazardous materials. Potential e-wastes, batteries and equipment will be monitored and disposed in line with relevant National Laws and Regulations.

Element	Water
Foreseeable effects	Waste-water pollution from discharge, harmful chemicals, toxic wastes
Estimated Change	Positive
Justification	Project activity does not produce any types of water-waste

Element	Natural Sources
Foreseeable effects	Potential negative effects on Flora, Fauna, Ecosystem
Estimated Change	Positive
Justification	Project activity does not produce any types of negative effect on Flora, Fauna, Ecosystem. However, the project activity provides GHG emission reduction which contributes to the maintenance of the ecological structure and composition of ecosystem.

9 Socio-economic aspects

Element	Improvement of Economic Conditions
Foreseeable effects	Potential positive effects on employment
Estimated Change	Positive

Justification	Project promotes full and productive employment opportunities by occupying workers for operations at site.
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Element	Improvement of health services
Foreseeable effects	Potential positive effects on health services
Estimated Change	Positive
Justification	Project activity promotes trainings on occupational health care, sanitation and precaution and supports to access health services.

Element	Education access
Foreseeable effects	Potential positive effects on education services
Estimated Change	Positive
Justification	Project activity promotes access to education on health care, climate change mitigations, occupational safety

10 Consultation with interested parties (stakeholders)

The project activities should be assessed according to the Environmental Impact Assessment Regulations which was enacted by the Ministry of Environment and Urbanization in Türkiye. Due to the project’s installed capacities which are less than the threshold limit specified for solar power plants in regulation, project activity has been classified as “out of EIA concern” type of project. The corresponding documents for each plant within the scope of this bundled project are available for BCR CAB Verifier review.

Since Environmental Impact Assessment is not required for the project by regulations, no local stakeholder consultation meeting conducted in a particular place which was not required too.

BCR Standard V3.0 indicates that there should be a LSC process considered for project activity. Hence, the local stakeholder consultation has been carried out through using project information notes and feedback forms delivered to local stakeholders via available site opportunities and e-mails. Date of Local Stakeholder Consultation is 11/05/2023 as the public institutions and organizations listed below have been informed via e-mail on same date.

The scope of consultation has been defined to inform stakeholders about environmental, social, financial, climate change mitigations and sustainable development aspects of project activity. A brief project information note and a feedback form have been delivered to local people of Belenoluk village which is the nearest settlement to project site and made publicly available at Mukhtar's office and asked for feedbacks between 20/05/2023 and 05/06/2023 for two weeks.⁶¹ The copies of sent e-mails and responses obtained from the stakeholders are available for BCR CAB Verifier review. The stakeholders that were invited to be informed for project activity are listed below:⁶²

- Bursa Province Governor
- Bursa Provincial Directorate of Environment and Urbanizations
- Orhaneli District Governor
- Mayor of Orhaneli Municipality
- Belenoluk Mukhtar
- Non-Governmental Organizations, (wwf.org.tr)
- Local people

10.1 Summary of comments received

The population of Belenoluk village is 62 residents by 2022.⁶³ Although much more people have been informed about project, the comments declared by 5 persons for each power plant in the Bundle. The feedback forms evaluated by local stakeholders on sites are available for BCR CAB Verifier.⁶⁴ The local people including Mukhtar, Farmers and a retired Officer have been presented their feedbacks as stakeholders of project. None of the invited official and NGO institutions have been commented to consultation.

⁶¹ Mukhtar's letter on publicly declaration of project information

⁶² Invitation letters to official institutions.

⁶³ <https://www.nufusune.com/184529-bursa-orhaneli-belenoluk-mahallesi-nufusu>

⁶⁴ Copies of feedback questionnaires from stakeholders

In general feedbacks of local people are positive about the projects. Their evaluation seems to have a positive assessment regarding the solar power plants. The main points mentioned in feedbacks are;

- Clean and sustainable energy via solar power
- Employment opportunities provided to the local people
- Contribution to National economy
- Effective utilization of unfavorable rural area
- No harmful effect to nature and rural area

Stakeholders have been declared positive comments about the project during the interviews.

10.2 Consideration of comments received

The comments have been discussed by the consultant and the project owner. It is evaluated that there is no negative comment and grievance according to the project implementation. There were no negative comments in general by mail replies of institutions and interviews of local stakeholders. However, the contact information of the consultant and site managers was shared with the stakeholders in order to be able to contact to declare any potential grievance that may occur in future.

11 Sustainable Development Objectives (SDG)

Contribution of project activity to Sustainable Development Goals (SDG) has been assessed by considering “BCR Tool for the determination of contribution of fulfillment of the Sustainable Development Goals (SDGs) on the Greenhouse Gas (GHG) mitigation projects.” The following Goals are assessed as applicable SDGs according to the type and aspects of project activity.

SDG 7 Affordable and Energy: The project encourages the goal “Ensure access to affordable, reliable, sustainable, and modern energy for all” through clean energy generation. Project generates renewable energy by solar power that contributes SDG Target 7.2 By 2030, increase substantially the share of renewable energy in the global energy mix. Project promotes increase substantially by increase in the share of renewable energy in the global energy mix by generating 7,539MWh per year.

SDG 8 Decent Work and Economic Growth: The project encourages the goal “Promote sustained, inclusive and sustainable economic growth, full and productive employment and decent work for all” by SDG Target 8.5 “By 2030, achieve full and productive employment and decent work for all women and men, including for young

people and persons with disabilities, and equal pay for work of equal value. Project promotes full and productive employment opportunities by occupying 2 workers for operations at site.

SDG 9 Industry, Innovation and Infrastructure: The project encourages the goal “Build resilient infrastructure, promote inclusive and sustainable industrialization and foster innovation” by SDG Target 9.4 requires “By 2030, upgrade infrastructure and retrofit industries to make them sustainable, with increased resource-use efficiency and greater adoption of clean and environmentally sound technologies and industrial processes, with all countries taking action in accordance with their respective capabilities”. Project promotes sustainable industrialization by Reduction in Emissions 4,887 tCO₂e per year.

SDG 13 Climate Action: The project encourages the goal “Take urgent action to combat climate change and its impacts” by generation of clean renewable energy and diminishing CO₂ emissions. Project contributes SDG Target 13.3 “Improve education, awareness-raising and human and institutional capacity on climate change mitigation, adaptation, impact reduction and early warning”. Project promotes improve education about awareness-raising and human and institutional capacity on climate change mitigation, adaptation by informing local and global stakeholders about its operations.

12 REDD+ Safeguards (if applicable)

Not applicable.

13 Special categories, related to co-benefits

Not applicable

14 Grouped Project (if applicable)

Enür Solar Power Plant Bundle Project is a group of five (5) individual unlicensed Photovoltaic Solar Power Plants located in the boundary of Belenoluk village, Orhaneli District in Bursa province of Türkiye. Components of Bundle project are:

- ENÜR Solar Power Plant
- RENDA Solar Power Plant
- ORHANELİ Solar Power Plant
- TABİİ KAYNAKLAR Solar Power Plant
- SERHAT ÖZTİMUR Solar Power Plant

General guideline for SSC CDM methodologies (version 23) rules (article 12) the Bundling of project activities as if project participants bring together more than one proposed small-scale CDM project activity as a bundle, project participants shall refer to the applicable provisions for bundling of project activities in the project standard.⁶⁵

The following requirements of BCR Registry Standard (version 3.0) rules activities in energy, transportation, and waste sectors have been assessed and presented by status of the project activity:

- (a) The geographical areas of project power plants included in Bundle project as initial instances are located in region of Belenoluk village, Orhaneli District, Bursa province of Türkiye. Geo-coordinates of the project activity are presented in Section 2.4 in detail.
- (b) Bundle Project power plants are Solar Power Plants which are in the scope of the BCR Standard (version 3.0)⁶⁶ can be certified and registered renewable energy generation projects. Project activity generates electricity energy from Solar Energy as defined “Energy obtained from that non-conventional source of renewable energy that consist of electromagnetic radiation from the Sun” in the BCR Project Certification and Registration Guidelines – Energy Sector Non-Conventional Renewable Energy Sources.⁶⁷ Hence, Bundle Project and components are comply with the guidelines of BCR Standard (version 3.0)
- (c) Project activity applies Approved CDM Methodology, AMS-I.D Small-scale Methodology Grid-connected renewable electricity generation (version 18.0) which is in comply with the energy sector and waste for BCR Standard. Project document and all relevant documentation have been presented in comply with all provision of the BCR methodological documents.
- (d) Emission reductions of initial instance power plants of Bundle Project are considered for Validation.
- (e) GHG emission reduction activities described for Validation of Bundle Project activity.
- (f) There are no new instances. All the project activities included in project document are initial instance projects.
- (g) There are no new instances. All the project activities included in project document are initial instance projects.

⁶⁵ https://cdm.unfccc.int/sunsetcms/storage/contents/stored-file-20210211212225226/MethSSC_Guid25ver23.1.pdf

⁶⁶ https://biocarbonregistry.com/standard/BCR_Standard_en.pdf

⁶⁷ <https://biocarbonregistry.com/methodologies/BCR-Energy-Sector-Guide.pdf>

- (h) No new instances are included. Start date of the GHG emission reduction activities in the cases included in the validation (initial instances activities) is 19/02/2018 as presented in official commissioning protocols of projects.⁶⁸
- (i) Determination of baseline scenario is presented in Section 3.3. and demonstration of additionality is presented in section 3.4 in details of project document.
- (j) The project activity initial instances are only renewable components as photovoltaic solar power plants, and total installed capacity is 4,250kWe which does not exceed the eligibility limit of 15 MW for a small-scale CDM project activity applies approved CDM Methodology, AMS-I.D Small-scale Methodology Grid-connected renewable electricity generation (version 18.0)

15 Other GHG programs

Project activity has not been registered under another GHG program.

16 Monitoring plan

16.1 Data and parameters for quantifying emission reductions

Data / Parameter:	<i>EG_{,facility,y}</i>			
Data unit:	MWh			
Description:	Quantity of net electricity generation supplied by the project plant/unit to the grid in year <i>y</i>			
Source of data	The basic source of data is the Main and Backup Meters located in power plants. ⁶⁹			
	SPP Name	Main Meter	Backup Meter	Brand
	ENÜR	40184050	40184051	Landis+Gyr
	RENDA	40184045	40184047	Landis+Gry
	ORHANELİ	40184044	40184046	Landis+Gry
	TABI KAY.	40184049	40184048	Landis+Gry
	SERHAT Ö.	40184064	40184067	Landis+Gry
Value applied:	Estimated annual generation is 7,539 MWh/yr			

⁶⁸ Official Commissioning protocols

⁶⁹ Commissioning Protocols of power plants

Measurement procedures (if any):	The official data will be read and recorded monthly by ULUDAĞ EDAS system (official distribution company) and used as data input for invoicing. Electricity generation data is recorded by two electricity meters. The data is the net electricity exported to the grid after the transmission losses and the electricity consumption of Power Station from grid. Monthly invoicing data derived from ULUDAĞ EDAS records will be used as main, official source for electricity generation measurement records for emission reduction calculations. In case of any inconsistency, project proponent reminds the ULUDAĞ EDAS Centre for cross checking and reporting both main and backup records at ULUDAĞ EDAS data centre.
Monitoring frequency:	It is continuous monitoring, hourly measurement and Reported Monthly.
QA/QC Procedures:	Calibration of the meters are valid for 10 years as determined by the relevant regulation of “Measuring and Measuring Instruments Inspection, article 9.b” published and applied by Turkish legislation. ⁷⁰ The meters are sealed to secure, and the project proponent or any other unauthorized person are not allowed to access the meters. EPDK regulations will be followed for the meters to identify the accuracy class of the meters.
Any comment:	Applied Methodology: CDM Methodology, AMS-I.D Small-scale Methodology Grid-connected renewable electricity generation (version 18.0) Purpose of Parameter: Calculation of baseline emissions

16.2 Additional information to determine the baseline or reference scenario

Data / Parameter:	$EF_{grid,CM,y}$
Data unit:	t CO ₂ e/MWh
Description:	CO ₂ emission factor of the grid electricity in year y Emission factor of the Turkish National Grid determined ex-ante. It's been published by the Ministry of Energy and Natural Resources for 2019 on 06/10/2021 which is latest available data.

⁷⁰ <https://www.mevzuat.gov.tr/mevzuat?MevzuatNo=6381&MevzuatTur=7&MevzuatTertip=5>

Source of data	"Türkiye National Network Emission Factor Data Sheet" which is latest publicly available data by Ministry of Energy and Natural Resources on. ^{71 72} https://enerji.gov.tr/Media/Dizin/BHIM/tr/Duyurular//Bilgi_Formu_Web_Sitesi_2019_202110071443.pdf
Value applied:	0.6482 tCO ₂ e/MWh
Measurement procedures (if any):	As per publication of "Türkiye National Network Emission Factor Data Sheet" the emission factor is indicating National Electricity Grid emission factor for the year 2019 that includes Operating Margin (OM), Build Margin (BM) and Combined Margin (CM) Emission Factors calculated by using CDM TOOL 07 – V06.0. Operating Margin (OM) = 0.7258 tCO ₂ /MWh Build Margin (BM) = 0.4153 tCO ₂ /MWh Combined Margin (CM) = 0.6482 tCO ₂ /MWh for Solar and Wind
Monitoring frequency:	Fixed as ex-ante
Any comment:	Applied Methodology: CDM Methodology, AMS-I.D Small-scale Methodology Grid-connected renewable electricity generation (version 18.0) Purpose of Parameter: Calculation of baseline emissions

16.3 Information related to environmental impact assessment of GHG project activities

Element	Measure of Impact	Responsible
Air	Positive / Negative	ENÜR Energy A.Ş.
Land	Positive / Negative	ENÜR Energy A.Ş.
Water	Positive / Negative	ENÜR Energy A.Ş.
Natural Sources	Positive / Negative	ENÜR Energy A.Ş.

⁷¹ <https://enerji.gov.tr/duyuru-detay?id=195>

⁷²

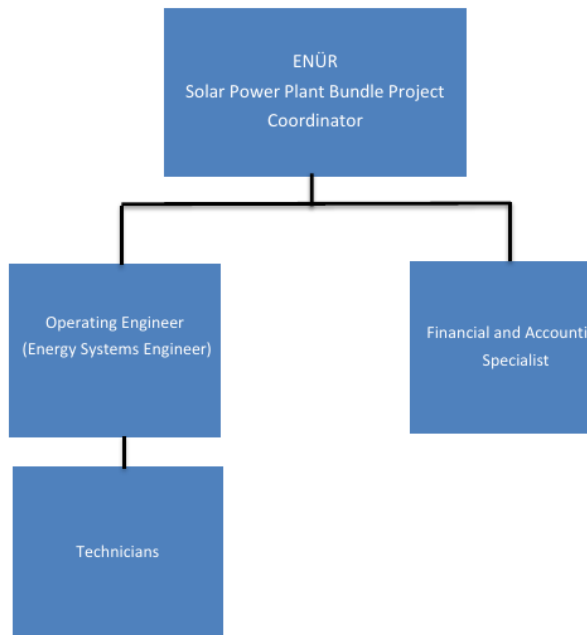
https://enerji.gov.tr/Media/Dizin/BHIM/tr/Duyurular//Bilgi_Formu_Web_Sitesi_2019_202110071443.pdf

16.4 Procedures established for the management of GHG emission reductions or removals and related to quality control

The project proponent has already assigned qualified employees who are in charge of the monitoring and execution of project activities. The basic monitoring structure of the Enür Solar Power Plant Bundle Project is consisted of the following team:

- Energy Projects Coordinator
Coordination of SPP Units and Cooperate Management
- SPP Operating Engineer
Managing the Operation of SPP Units
Managing the data collection and recording for the BCR Monitoring Report.
Execution of data recording and archiving system
- Financial and Accounting Specialist
Recording and monitoring of the financial records of electricity sold to Grid.
- Technicians
Execution of day-to-day operations of SPP Units

Figure 4: Roles and responsibilities of Monitoring Team



Monitoring Plan will be implemented by the following steps:

- 1) The electricity generated will be metered by the electricity meters placed at the point of connection to national grid, in power station. It is a small concrete, compact and secured building contains main and backup meters, transformers and other related equipment for each of power plant included in Bundle Project. Project activity is connected to National grid through connection to ORHANELİ TM sub-center. The metering and data acquisition will be processed according to ULUDAĞ EDAS's (official distribution company) defined rules and procedures.⁷³ ULUDAĞ EDAS will perform the calibration of the metering devices whenever deemed necessary.
- 2) The official data will be read and recorded monthly by ULUDAĞ EDAS system and used as data input for invoicing. The data is the net electricity exported to the grid after the transmission losses and the electricity consumption of Power Station from grid. Monthly invoicing data derived from ULUDAĞ EDAS records will be used as main, official source for electricity generation measurement records for emission reduction calculations.
- 3) Main meter records are accepted as official data for generation measurement. In the case of inconsistency backup meter has been used to cross-check generation.
- 4) The official data will be cross-checked by the measurements of net electricity supplied to Turkish Grid by project power plant will be recorded by remote electrical system of ULUDAĞ EDAS. In case of any inconsistency, project proponent reminds the ULUDAĞ EDAS Centre for cross checking and reporting both main and backup records at ULUDAĞ EDAS data center.
- 5) Another parameter that will be monitored is Installed Capacity of the Solar Power plant after the implementation of the project activity. It will be recorded once at the beginning of each crediting period through checking the equipment at the project site by panels name plates.

⁷³ Official distribution agreements with ULUDAĞ EDAŞ Distribution Company.

- 6) SCADA monitoring system installed with panels and inverters by manufacturer which monitors the functioning of all electrical system is also enables the project proponent to monitor generation.
- 7) All monitoring data collected will be archived electronically and will be kept at least for two years after the end of the last crediting period.
- 8) The emission reduction will be calculated by multiplying the net electricity with the calculated Combined Margin Emission Factor as presented in the 'project document'.
- 9) Monitoring is a key procedure to verify the real and measurable emission reductions from the Project. To guarantee project's real, measurable and long term GHG emission reductions, Operation Engineer will continue to be responsible for the electricity generated, gathering all relevant data by accessing the ULUDAĞ EDAŞ database and keeping a copy of records for future periods. He has been already informed about CDM/VER and BCR Registry concept and mechanism and how to monitor and collect the data which will be used for emission reduction calculations for subsequent monitoring periods.
- 10) Besides monitoring of GHG emission reduction parameters, Operation Engineer will be responsible for monitoring and recording of Environmental and Social Impacts, SDG Contribution parameters.

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NOTE: This Project Document (PD) must be completed following the instructions contained in the Annex. However, it is important to highlight that these instructions are complementary to the BCR STANDARD, and the Methodology applied by the project holder, in which more information on each section can be found.