Gold Standard
for the Global Goals

TEMPLATE

KEY PROJECT INFORMATION & PROJECT DESIGN DOCUMENT (PDD)

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VERSION **v. 1.2**

RELATED SUPPORT

- **TEMPLATE GUIDE Key Project Information & Project Design Document v.1.2**

This document contains the following Sections

KEY PROJECT INFORMATION

GS ID of Project	GS7775
Title of Project	ARISU SOLAR POWER PLANT
Time of First Submission Date	20/01/2020
Date of Design Certification	30/03/2023
Version number of the PDD	07
Completion date of version	06/12/2023
Project Developer	GTE Karbon Sürdürülebilir Enerji Eğitim Danışmanlık ve Tic. A.Ş.
Project Representative	Gün Güneş Enerjisi Elektrik Üretim Sanayi ve Ticaret A.Ş.
Project Participants and any communities involved	Gün Güneş Enerjisi Elektrik Üretim Sanayi ve Ticaret A.Ş (Project Owner, Private Entity) GTE Karbon Sürdürülebilir Enerji Eğitim Danışmanlık ve Tic. A.Ş (Project Developer, Private Entity)
Host Country (ies)	Turkey
Activity Requirements applied	☐ Community Services Activities ☒ Renewable Energy Activities ☐ Land Use and Forestry Activities/Risks & Capacities ☐ N/A
Scale of the project activity	☐ Micro scale ☐ Small Scale ☒ Large Scale
Other Requirements applied	N/A
Methodology (ies) applied and version number	ACM0002 - "Grid connected electricity generation from renewable sources" - Version 21.0
Product Requirements applied	☒ GHG Emissions Reduction & Sequestration ☐ Renewable Energy Label ☐ N/A
Project Cycle:	☐ Regular ☒ Retroactive

Table 1- Estimated Sustainable Development Contributions

Sustainable Development Goals Targeted	SDG Impact (defined in B.6.)	Estimated Annual Average	Units or Products
13 Climate Action (mandatory)	Reduction in GHGs emissions	70,873	tCO_2e/yr (GS VERs)
7 Affordable and Clean Energy	Renewable energy generation	109.237	GWh/yr
8 Decent Work and Economic Growth	Increased employment opportunities	At least 19	Number of recruited staff

SECTION A. DESCRIPTION OF PROJECT

A.1 Purpose and general description of project

Arisu Solar Power Plant will be developed by Gün Güneş Enerjisi Elektrik Üretim Sanayi ve Ticaret A.Ş. The project is reducing the national energy deficit and development of local industries as it allows the use of local sources for energy generation to meet the increasing demands.

The purpose of the project is to generate clean energy by harnessing the solar power and providing the energy to the Turkish national grid. By implementing the project, investors also aim to reduce dependency to the fossil fuels thereby reducing the sources of environmental pollution. The project is a greenfield project.

i. The location of the project activity

Arisu SPP is located in Arısu Neighbourhood in Tuşba district of Van province. By implementing the project, investors also aim to reduce dependency to the fossil fuels thereby reducing the sources of environmental pollution.

ii. The technologies/measures to be employed and/or implemented by the project activity

Gün Güneş Enerjisi Elektrik Üretim Sanayi ve Ticaret A.Ş plans to install 137,8351 PV panels in Tuşba District of Van with the purpose of contributing to the national economy the meeting the increased electricity demand2. Total installed capacity of the plant is 55.54 MWm/45 MWe. Total output of the plant will be limited at 45 MWe as per the capacity allowed in preliminary generation license with the help of software usage.

iii. The project boundary

The project boundary is considered as the National Electricity Grid of Turkey 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 power plant is connected to.

iv. *The baseline scenario*

According to the methodology, baseline scenario was identified as "the electricity delivered to the grid by the project activity that otherwise would have been generated by the operation of grid-connected power plants and by the addition of new generation sources".

The project activity will generate greenhouse gas (GHG) emission reductions by avoiding CO2 emissions from electricity generation by fossil fuel power plants connected to Turkish National Power Grid. The average annual generated energy of 109.237 GWh, will be able to deliver a reduction in emissions of around 70,873 tCO2e (tons of carbon dioxide equivalent) per annum.

Main goals of the Arısu Solar Power Plant Project include:

[1] Provisional Acceptance No.5
[2] Arısu SPP EIA, page 6

- Utilization of the solar potential of Turkey to meet increasing electricity demand and maintain energy security. In total, the solar energy capacity of Turkey is lower than 7% of the total installed capacity3.
- Reduction of GHG emissions through increasing share of renewable resources.
- Contribution to economic development by creating direct and indirect job opportunities during construction and operation phases.
- Reduction of import dependency on fossil fuel weighed electricity sector and diversify generation mix through use of local resources.
- Contribution to sustainable development through supporting local community and local economy.

In terms of local benefits, the project mainly contributes to the reduction of local air pollutants and local employment.

Table 2- Milestones for Arısu SPP

Milestone	Date
Preliminary Licence	03/11/2016
EIA Stakeholder Meeting	23/01/2017
Environmental Impact Assessment Report (Final)	28/09/2017
Environmental Impact Assessment Approval	13/10/2017
First Submission to GS	20/01/2020
Updated Generation Licence	28/05/2020
EPC Contract*	28/05/2020
Provisional Acceptance No.1**	28/10/2020
Provisional Acceptance No.2	15/04/2021
Provisional Acceptance No.3	28/05/2021
Provisional Acceptance No.4	07/07/2021
Provisional Acceptance No.5	19/08/2021
Stakeholder Consultation Report	30/05/2022

*Project start date
**Project commissioning date

[3] https://www.enerji.gov.tr/tr-TR/Sayfalar/Elektrik

A.1.1. Eligibility of the project under Gold Standard

Project activity involves construction of a 45 MWe solar power plant for electricity generation. Project is categorized as "Renewable Energy Supply" according to GS definition whereas it is included in the sectoral scope 1 "Energy Industry – Renewable Sources" according to the UNFCCC definition. Project type is retroactive as per the GS rules.

Project is not registered and also will not benefit from other certification schemes or renewable energy labelling standards. Project meets eligibility criteria as per section 3.1.1 of GS4GG Principles & Requirements, as described below:

i. The project is not pre-identified as eligible.

ii. Gold Standard approval, GS4GG Principles and Requirements:

- Project is a renewable energy (solar) installation activity.
- Project activity includes physical action/implementation on the ground.
- Project is located in Turkey, which is eligible for VER projects.
- Project is a large-scale renewable energy plant with defined boundaries.
- Project contributes to sustainable development goals.
- Project is in compliance with GS safeguarding principles.
- Stakeholders are involved in project implementation and planning during local consultation meetings and feedback rounds.
- Project outcomes are validated/verified by approved bodies.
- Additionality is demonstrated as per the applicable tools and methodologies.

iii. The project meets the General Eligibility Criteria of the applicable Activity Requirements:

Scale of the project activity: The project is a 45 MWe solar power project and exceeding the 15 MW limit for small scale project according to UNFCCC regulations, the project is categorized under large scale.

Renewable Energy Activity Requirements:

- 4.1 Principle-1: Contribution to Climate Security & Sustainable Development: Project contributes 3 SDGs including SDG 13. Please see Section B 6.1.

- 4.2 Principle-2: Safeguarding Principles: Please see Section D.
- 4.3 Principle-3: Stakeholder Inclusivity: Please see Section E.
- 4.4 Principle-4: Demonstration of Real Outcomes: Please see Section B 6.4.
- 4.5 Principle-5: Financial Additionality & Ongoing Financial Needs: Please see Section B.5.

iv. The project is not registered with any other voluntary or compliance schemes.

The project does not claim Green or White certificates or equivalents that may result in double counting because of carbon dioxide emission reduction purposes. Project is not registered and will not benefit from other certification schemes or renewable energy labelling standards.

v. The activity is NOT located in a host country, region, locality or state that has an emission reduction cap enforced OR has the possibility to trade emissions that include the scope of the proposed project

As Turkey, the host country, has no cap on GHG emissions, the GS VERs don't need to be backed up by allowances or other denominated units resulting in local authorities stating that an equivalent number of allowances will be retired to back up the GS VERs issued. The project will be registered and seek approval from the national registry on GHG emission reduction projects as regulated by Communique on Procedures for Registration of Greenhouse Gas Emission Reduction Projects4.

vi. There is no potential for double counting of impacts if the Project Area overlaps with that of another Gold Standard or other voluntary or compliance standard programme of a similar nature.

vii. The project is in compliance with Turkey's legal, environmental, ecological and social regulations.

viii. Type of the project activity

[4] http://www.mevzuat.gov.tr/Metin.Aspx?MevzuatKod=9.5.14195&MevzuatIliski=0&sourceXmlSearch=

The proposed project fits into 'Renewable Energy Supply' category as defined generation and delivery of energy services from non-fossil and non-depletable sources as solar being one.

ix. Greenhouse Gases

The project activity complies with Gold Standard and UNFCCC eligibility criteria as reducing carbon dioxide emission that is mainly produced by the Turkish Grid dominated by fossil fuel power plants.

x. Official Development Assistance:

As Turkey being a part of the DAC list of ODA Recipients of OECD5, a written declaration of non-ODA for the project activity will be submitted.

A.1.2. Legal ownership of products generated by the project and legal rights to alter use of resources required to service the project

Gün Güneş Enerjisi Elektrik Üretim Sanayi ve Ticaret A.Ş is the legal owner of the products and all legal rights of the project.

A.2 Location of project

A.2.1 Host Country

Turkey

A.2.2 Region/State/Province etc.

Van

A.2.3 City/Town/Community etc.

Arısu neighbourhood in Tuşba district.

A.2.4 Physical/Geographical location

[5] http://www.oecd.org/dataoecd/9/50/48858205.pdf

The proposed project is located in Arısu Neighbourhood in Tuşba district of Van province. The total area of the project is 749,050 m^2.6

Figure 1 Project area[7]

[6] Arısu SPP EIA, page xiii
[7] Arısu SPP EIA, page 9

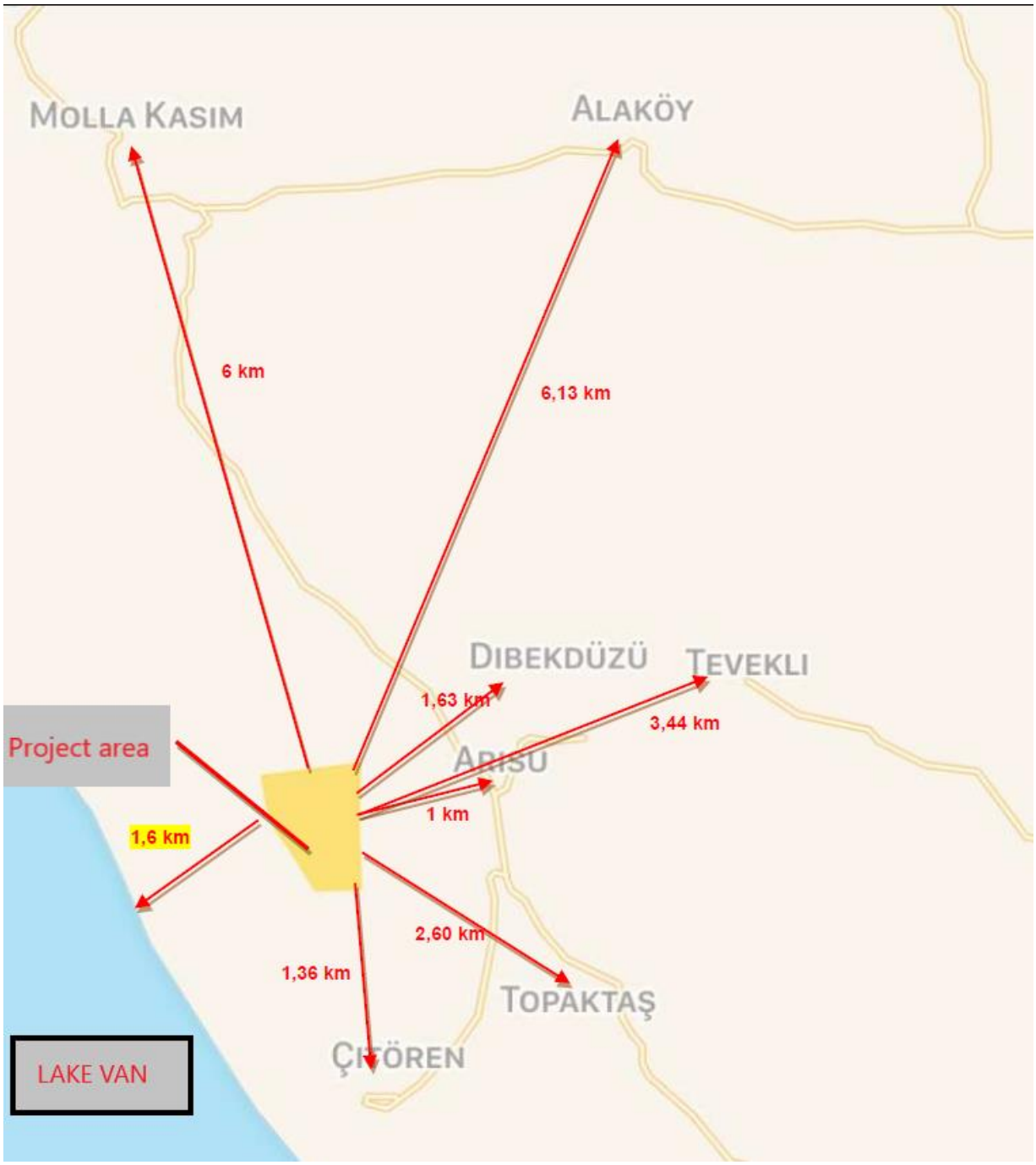

Figure 2 Closest settlements to the project area[8]

[8] Arısu SPP EIA, page 11

A.3 Technologies and/or measures

There are a total of 137,835 PV panels. Total installed capacity of the plant is 55.54 MWm/45 MWe. Total output of the plant will be limited at 45 MWe as per the capacity allowed in preliminary generation license with the help of software usage. Bifacial TwinPlus Big Cell Module 395-405W type PV modules will be used in the project. As stated in the product brochure, the PV modules are expected to have a 25-year lifetime of linear performance. Technical properties of the modules are represented below:

MECHANICAL CHARACTERISTICS	
Dimension (L× W × H)	Length: 2030mm (79.92 inch) Width:1010mm (39.76 inch) Height: 30mm (1.18 inch)
Weight	24kg （52.92 lb ）
Glass	3.2mm
Backsheet	Transparent Mesh Backsheet
Frame	Anodized aluminiun alloy
Cable	4mm² (IEC) ， Length:350mm （vertical ） 1250mm （horizontal） or Customized length
Junction Box	IP 68 rated

ABSOLUTE MAXIMUM RATING	
Parameter	Values
Operating Temperature	From -40 to +85°C
Hail Diameter @ 80km/h	Up to 25mm
Surface Maximum Load Capacity	Up to 5400Pa
Maximum Series Fuse Rating	20A
IEC Application Class (IEC61730)	A
Fire Rating (IEC61730)	A
Maximum System Voltage	DC 1000V/1500V （IEC ）

Table below shows the equipment and infrastructure installed for the project.

Table 3- Equipment and infrastructure to be installed[9]

[9] Arısu SPP EIA, page 6

Equipment / Infrastructure	# Number
Photovoltaic panel	137,835
Junction box	588
Invertor	28
Step-up transformer	28
OG cell	28
154 kV switching station	1
Administration building	1

The project will be connected to the National Grid by 154 kV transmission line via Van 380 Substation[10]. In addition, plant load factor is the ratio between the actual energy generated by the plant to the maximum possible energy that can be generated with the plant working at its rated power. For a duration of an entire year is calculated as 27.71 %. Calculation is given below:

$$\frac{109{,}237\ MWh}{45\ MWe} * \frac{1}{365 * 24\ hours} * 100 = \ 27.71\ \%$$

A.4 Scale of the project

For the purpose of applying UNFCCC methodologies for quantification of GHG reductions, "small scale" is defined as Renewable Energy Project with installed capacity less than or equal to 15 MWe or 45 MWth as per Renewable Energy Activity Requirements ver. 1.4, para. 3.3.2[11]. Therefore, project is considered to be a "large scale" project with 45 MWe.

A.5 Funding sources of project

Project will be funded by company's own resources. The project activity does not receive public funding. The project does not receive or benefit from Official Development Assistance (ODA).

[10] Arısu SPP EIA, page xiii

[11] https://globalgoals.goldstandard.org/202-ar-renewable-energy-activity-requirements/

SECTION B. APPLICATION OF APPROVED GOLD STANDARD METHODOLOGY (IES) AND/OR DEMONSTRATION OF SDG CONTRIBUTIONS

B.1. Reference of approved methodology (ies)

The United Nations approved consolidated baseline methodology applicable to this project is ACM0002 "Large-scale Consolidated Methodology: Grid-connected electricity generation from renewable sources" Version -21.0[12]

ACM0002 refers to the following tools:

- "Tool for the demonstration and assessment of additionality", Version 7.0.0[13] and,
- "Tool to calculate the emission factor for an electricity system", Version 7.0[14].

B.2. Applicability of methodology (ies)

The choice of methodology ACM0002, is justified as the project activity meets its applicability criteria:

- Arısu Solar Power Plant is a large-scale solar power type, greenfield, grid connected renewable electricity generation project.
- The project does not involve a capacity addition to an existing plant.
- The project does not involve a retrofit of an existing operating plant.
- The project does not involve a rehabilitation of an existing plant.
- The project does not involve a replacement of an existing plant.
- The project does not involve switching from fossil fuel use to renewable energy at the site of the project activity.
- The geographic and system boundaries for the relevant electricity grid can be clearly identified and information on the characteristics of the grid is available.

[12] https://cdm.unfccc.int/UserManagement/FileStorage/ZPFJL01OU2RYC6N3HASIXV7K84QBG9
[13] https://cdm.unfccc.int/methodologies/PAmethodologies/tools/am-tool-01-v7.0.0.pdf
[14] https://cdm.unfccc.int/methodologies/PAmethodologies/tools/am-tool-07-v7.0.pdf

Applicability of the Tools Referred in the Applied Methodology

The applicability conditions of the tools mentioned above are presented as follows:

Tool & Applicability	Justification
"Tool for the demonstration and assessment of additionality", Version 7.0.0	
The use of the "Tool for the demonstration and assessment of additionality" is not mandatory for project participants when proposing new methodologies. Project participants may propose alternative methods to demonstrate additionality for consideration by the Executive Board. They may also submit revisions to approved methodologies using the additionality tool.	The tool is used since it is included in the approved Methodology ACM0002.
Once the additionally tool is included in an approved methodology, its application by project participants using this methodology is mandatory.	This condition is valid, and the tool is applied since it is included in the approved Methodology ACM0002.
"Tool to calculate the emission factor for an electricity system", Version 7.0	
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).	This condition is applicable. OM, BM, and CM are estimated using this tool under section B.6.3 for calculating baseline emissions.
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	Since the project activity is grid connected, this condition is applicable, and the emission factor has been calculated accordingly.

power plants. 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.	
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.	Not relevant. This is not a CDM project.
Under this tool, the value applied to the CO_2 emission factor of biofuels is zero.	The project activity is a grid connected solar power project and not a hydro power plant. Therefore, this criterion is not relevant for the project activity.

B.3. Project boundary

The project boundary is considered as the National Electricity Grid of Turkey 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 power plant is connected to.

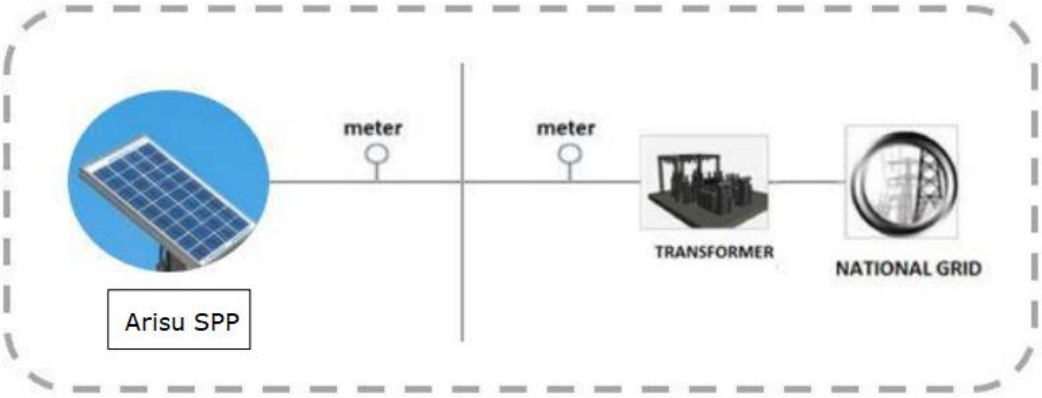

Figure 3 Project Boundary

The project does not involve any other emissions sources not foreseen by the methodologies. The greenhouse gases and emission sources included in or excluded from the project boundary are shown in table below.

Table 4- GHGs Included in the Project Boundary

Source		GHGs	Included?	Justification/Explanation
Baseline scenario	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. Excluded for simplification
		N_2O	No	Minor emission source. Excluded for simplification
Project scenario	Source 1	CO_2	No	N/A. It is a renewable energy (solar) project.
		CH_4	No	N/A. It is a renewable energy (solar) project.
		N_2O	No	N/A. It is a renewable energy (solar) project.

B.4. Establishment and description of baseline scenario

According to the methodology, baseline scenario was identified as "the electricity delivered to the grid by the project activity that otherwise would have been generated by the operation of grid-connected power plants and by the addition of new generation sources".

Turkish electricity generation is mainly composed of thermal power plants and the share of renewable resources; especially hydroelectric power plants have decreased

significantly in recent years whereas share of solar power plants is still very low. Since Turkey is an advanced developing country, there is an increasing demand for electricity which is fully expected to continue in the foreseeable future.

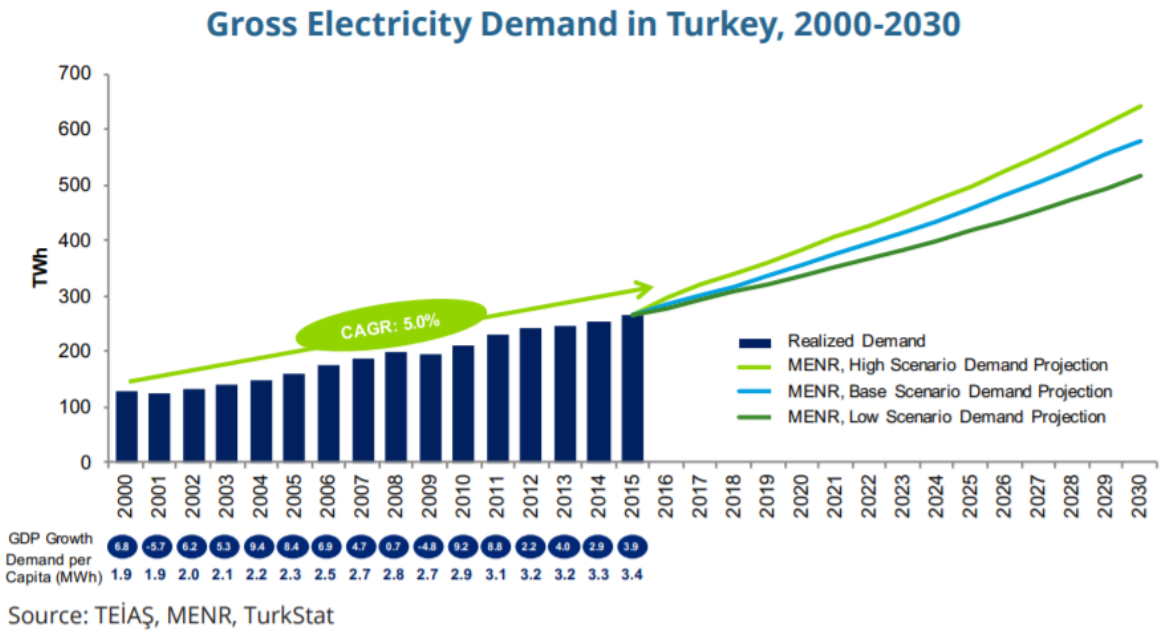

Figure 4 Projection of Turkey's electricity demand[15]

The trend in Turkey to date and given historically slow development of alternative energy resources is to build an increasing number of thermal power plants in the future to satisfy the annual growth in energy consumption demand. Turkey as an advanced developing nation has looked at dealing with energy security by developing and constructing high-capacity coal and natural gas power plants. The development of thermal power plants has been also encouraged by the large natural resource availability in Turkey, especially the abundance of economically accessible lignite.

In the absence of the project activity, the same amount of electricity is required to be supplied via either the current power plants or by increasing the number of thermal power plants thus increasing GHG emissions.

[15] https://www.dunyaenerji.org.tr/wp-content/uploads/2017/10/turkish-energy-market-outlook.pdf

According to the Ministry of Energy and Natural Resources statistics[16], share of SPPs could hardly reach 6.6% in 2019 whereas share of natural gas and coal was around 51% together. When we look at the annual development of Turkey's gross generation in recent years, we see that grid is dominated by thermal power plants and which is boosted by increasing energy demand in parallel to increase population and per capita income. Hence, baseline of Turkey's electricity grid will continue to be dominated by fossil fuel power plants which is seen as the quickest solution in short term to meet the demand and enable energy security in supply side.

B.5. Demonstration of additionality

Specify the methodology, activity requirement or product requirement that establishes deemed additionality for the proposed project (including the version number and the specific paragraph, if applicable).	Selected methodology: ACM0002, Version 21.0 "Large-scale consolidated methodology for grid-connected electricity generation from renewable sources" Tools: "tool to calculate the emission factor for an electricity system, version 7" & "tool for assessment and demonstration of additionality, version 7" The baseline scenario for the project has been defined as "generation of equal amount of electricity by the power plants connected to the grid". Emission factor for the baseline scenario has been calculated according to the combined margin approach as defined by the selected methodology.

[16] https://www.enerji.gov.tr/tr-TR/Sayfalar/Elektrik

Describe how the proposed project meets the criteria for deemed additionality.	Within this framework, the project is expected to generate about 109,237,000 kWh electricity and reduce about 70,873 tCO2 emissions through replacing the electricity that would need to be supplied via the national grid in the absence of the project activity. Additionality of the proposed project has been assessed according to the applied tool for demonstration of additionality as shown in following steps.

According to tool for demonstration and additionality the steps listed below are followed in detail:

***Sub-step 1a* - Define alternatives to the project activity:**

The most realistic and reliable alternatives to the project activity are:

1. Proposed project is not undertaken as a VER project activity
2. Continuation of the current situation-supply of equal amount of electricity by the newly built grid connected power plants

The first alternative, which is the implementation of the project without carbon revenue is not financially attractive as discussed in investment analysis section below. The Second alternative (Scenario 2) is the baseline scenario and implementation of the proposed project as a VER activity would be additional to this scenario. Continuation of the current situation is not considered as a realistic alternative due to increasing electricity demand therefore new power plants should be constructed which includes mainly thermal power plants. Implementation of the project is additional to the baseline scenario which is alternative 2 above and therefore reduces the emissions.

Outcome of Step 1a

Continuation of the current situation is not considered as a realistic alternative due to increasing electricity demand therefore new power plants should be constructed which includes mainly thermal power plants. Implementation of the project is additional to the baseline scenario which is an alternative 2 above and therefore reduces the emissions.

Sub-step 1b. Consistency with mandatory laws and regulation

The following applicable mandatory laws and regulations have been identified:

1. Electricity Market Law[17]
2. Law on Utilization of Renewable Energy Resources for the Purpose of Generating Electricity Energy[18]
3. Energy Efficiency Law [19]
4. Forest Law[20]
5. Environment Law[21]

The resultant alternatives to the project as outlined in Step (1a) follow the applicable laws and regulations.

Outcome of Step 1b

Mandatory legislation and regulations for each alternative are taken into account in sub-step 1b. Based on the above analysis, the proposed project activity is not the only alternative amongst the project participants that is in compliance with mandatory regulations. Therefore, the proposed VER project activity is considered as additional.

Step 2 - Investment analysis

The investment analysis has been done to make an economic and financial evaluation of the project. Investment decision date has been determined to be the date of EPC contract, 28/05/2020, and the period of assessment including IRR and equity IRR calculations have been chosen accordingly.

17 Law number 6446, Published in official gazette No. 28603 on 30/03/2013 http://www.mevzuat.gov.tr/MevzuatMetin/1.5.6446.pdf

18 Law number 5346, Published in official gazette No. 25819 on 18/05/2005 http://www.mevzuat.gov.tr/MevzuatMetin/1.5.5346.pdf

19 Law number 5627, Published in official gazette No. 26510 on 02/05/2007 http://www.mevzuat.gov.tr/MevzuatMetin/1.5.5627.pdf

20 Law number 6831, Published in official gazette No. 9402 on 08/09/1956 http://www.mevzuat.gov.tr/MevzuatMetin/1.3.6831.pdf

21 Law number 2872. Published in official gazette No. 18132 on 11/08/1983 http://www.mevzuat.gov.tr/MevzuatMetin/1.5.2872.pdf

No public funding or ODA are available in Turkey for finance of this type of projects.

***Sub-step 2a* - Determine appropriate analysis method**

There are three options for the determination of analysis method which are:

- Simple Cost Analysis
- Investment Comparison Analysis and
- Benchmark Analysis

Since project generates economic benefits from sales of electricity, the simple cost analysis is not applicable. Also, since the baseline of the project is generation of electricity by the grid, no alternative investment is considered at issue. So, it has been decided to use benchmark analysis for evaluation of the project investment.

Sub-step 2b: Option III. Apply benchmark analysis

For benchmark analysis, figure defined by World Bank for similar project types have been used which has been given as 25% in the "Implementation Completion and Results Report" (Report No: ICR00004069, page 40).[22] Similar solar projects have been considered when choosing the benchmark.

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

Table 5- Main financial parameters used for investment analysis

Parameters	Unit	Data Value	Date of Reference
Installed Capacity[23]	MWe	45	28/05/2020
Grid Connected output[24]	MWh/year	109,237	28/05/2020
Total Estimated Capital Investment[25]	$	~64,035	19/06/2017

[22] http://documents.worldbank.org/curated/en/799701498842988254/pdf/ICR00004069-06192017.pdf

[23] Arısu SPP generation license

[24] Arısu SPP generation licence

[25] https://documents1.worldbank.org/curated/en/799701498842988254/pdf/ICR00004069-06192017.pdf

Total Estimated Operational Cost[26]	$	~1,218	-
Income tax rate[27]	%	22	2020
Feed in Tariff/Market price after 10th years[28],[29]	$ Cents/kWh	13.3 (first 10 years) 4.57 (after 10 years)	-
Expected VERs price[30]	$/ tCO_2e	3	2017

For the estimation of the operational cost, grid fees, maintenance, staff, and other costs were considered. Detailed calculations have been demonstrated in the Excel Spreadsheet. Investment cost per kW of capacity installed (1,423 US$/kW) values are considered from the World Bank's report (details are in IRR excel, Capital Cost Sheet)[31]. The installed capacity of the solar power plant is 45 MWe. The lowest estimated value is used for calculations, to demonstrate even with the lowest estimated cost, the project still is in need of carbon revenue.

Applied benchmark is defined by World Bank for renewable energy investments in Türkiye. It includes a threshold benchmark for IRR which is the minimum IRR required for financing a project. Hence, it is "commercial lending rate" as described by the tool 27. Benchmark IRR used has been taken from World Bank Loan provided to Turkish Renewable energy sector within the scope of clean technology fund (CTF). The proposed benchmark of CTF were deemed consistent with emission reduction project eligibility criteria (that is, significant potential in emission reductions, demonstration potential, development impact and implementation potential). Threshold IRRs have been determined for each project type which are the minimum IRRs to attract investors.

Internal Rate of Return (IRR) of the proposed project has been calculated as 13.70% based on the parameters given above without considering the carbon revenue. Project does not use any ODA or government incentive. Electricity tariff has been taken as

[26] Demonstrated in the IRR Excel Sheet
[27] https://www.gib.gov.tr/yardim-ve-kaynaklar/yararli-bilgiler/gecici-vergi-oranlari
[28] Renewable Energy Law (5346)
[29] https://rapor.epias.com.tr/rapor/xhtml/ptfSmfListeleme.xhtml
[30] State of Voluntary Carbon Markets Report 2017 (as the average voluntary offset price of 2017)
[31] https://documents1.worldbank.org/curated/en/799701498842988254/pdf/ICR00004069-06192017.pdf

$13.3 Cent/kWh for first 10 years and 4.57 $ Cent/kWh after 10 years. Within the scope of the Renewable Energy Resources Support Mechanism, the price specified in the law has been taken for the first 10 years. After the first 10 years, an average of the market clearing prices of the past years has been taken to estimate the electricity price. Annual generation has been taken as 109.237 GWh as indicated in the licence.

Sub-step 2d - Sensitivity Analysis

Sensitivity analysis had been carried out for three main parameters identified for the first phase of the project. However, since the investment cost for extension is based on signed agreements and operating cost is not changed after extension, which is a conservative approach, only impact of change in tariff has been included in sensitivity analysis.

- Investment Cost
- Operating Cost
- Electricity Sales revenue

For a range of ± 15% fluctuations in parameters above, table below has been obtained.

Table 6- Sensitivity analysis for Arisu Solar Power Plant Project (without carbon revenue)

Fluctuation (+/- 15%)	-15	-10	-5	0	+5	+10	+15
Investment Cost	17.12	15.84	14.71	13.70%	12.79	11.98	11.25
Operating Cost	13.74	13.72	13.71	13.70%	13.68	13.67	13.66
Electricity Income	10.85	11.79	12.74	13.70%	14.66	15.63	16.60

Outcome of Step 2:

The investment and sensitivity analysis shows that the VER revenues will improve the financial indicators of the Project remarkably. Considering that figures above are based on a higher price rather than the government guaranteed floor price, optimistic estimations for yearly generation and that those figures do not reflect the risk for

investment, role of carbon income is a most significant number to enable the project to proceed.

Acceptable IRR values for energy investments in Turkey, given the present economic uncertainty, are expected at yields more than 25% per annum. Considering the market price risk, it can be concluded the extension will make the investment more feasible however, it will still be below the benchmark IRR.

According to local regulations, electricity price is determined daily according to Energy Market Regulatory Authority (EMRA) as defined in the regulations and there exists three tariffs during day, peak and night hours. Thermal power plants and HEPPs with storage facilities have flexibility to schedule their generation at peak hours when the tariff is high. However, solar power plants do not have storage facility therefore may not be able to benefit from high prices realized at when demand is high. According to EMRA figures, electricity tariff fluctuated between 4.3 $c/kWh and 8.6 $c/kWh between 01/04/2014 and 01/02/2016 whereas the weighted average of the tariff has been calculated as 6.2 $c/kWh in this period (**Figure 5**). The value does not provide any guarantee about the actual selling price as the control on generation period and tariff is limited and it may not be possible to generate and sell electricity during peak tariff periods. Also, considering that fluctuation in solar power exist and fact that a part of the electricity can be sold through bilateral agreements to free consumers with a discount rate over market price, guarantee price has been taken as reference in investment analysis which also provides input for evaluation of financing institutions.

Another important parameter affecting equity IRR is investment cost. However, since the agreements have been made and costs are realized as given in financial model, there is no chance to expect a decrease in the investment cost. Operating costs can also affect the equity IRR however, its impact is not significant and does not cause any significant change in equity IRR and the fluctuation percentage to reach the benchmark is very high and not likely. Based on the above information, it is seen that project is not the most attractive option. Therefore, project is considered as additional to the baseline scenario.

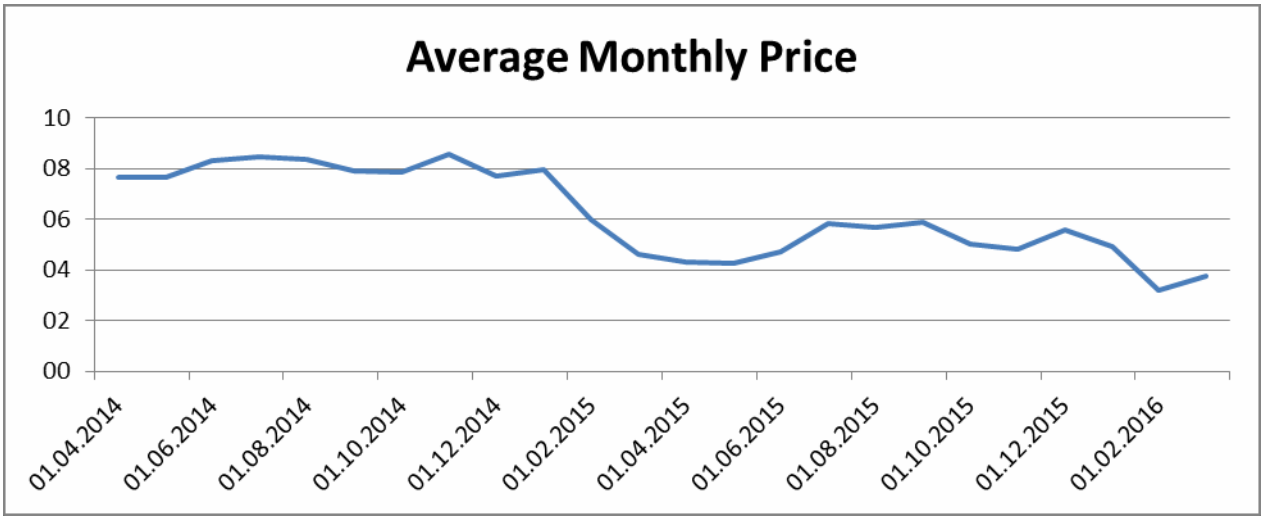

Figure 5 Highest tariffs observed between 01/04/2014-01/02/2016 ($ cents/kWh)

Step 3. Barrier analysis

This step is not applied as per the tool.

Step 4. Common Practice Analysis

According to the "Tool for the demonstration and assessment of additionality", Version 07.0.0", the common practice shall provide an analysis of any other activities that are similar to the Project Activity. Projects are considered similar if they are in the same country/region and/or rely on a broadly similar technology, are of a similar scale, and take place in a comparable environment with respect to regulatory framework, investment climate, access to technology, access to financing etc.

According to latest statistics published by General Directorate of Energy Affairs, there are 205 renewable energy projects both in same and different type technologies has operated until November 2020[32]

Guidelines on Common Practice version 03.1[33] has been followed.

[32] https://www.epdk.gov.tr/Detay/DownloadDocument?id=4ETVkLvlwO0=
[33] https://cdm.unfccc.int/methodologies/PAmethodologies/tools/am-tool-24-v1.pdf

Step 1: calculate applicable output range as +/-50% of the design output or capacity of the proposed project activity.

The total capacity of the proposed project is 45 MWe. Therefore, the applicable output range is from 22.50 MWe to 67.50 MWe.

Step 2: identify similar projects (both CDM and non-CDM) which fulfil all the following conditions:
(a)The projects are located in the applicable geographical area,
(b)The projects apply the same measure as the proposed project activity,
(c)The projects use the same energy source/fuel and feedstock as the proposed project activity, if a technology switch measure is implemented by the proposed project activity,
(d)The plants in which the projects are implemented produce goods or services with comparable quality, properties, and applications areas (e.g., clinker) as the proposed project plant,
(e)The capacity or output of the projects is within the applicable capacity or output range calculated in Step 1:
(f) The projects started commercial operation before the project design document (CDM-PDD) is published for global stakeholder consultation or before the start date of proposed project activity, whichever is earlier for the proposed project activity.

Applicable geographical area has been selected as the whole host country (Turkey) as per paragraph 1 of Guidelines on Common Practice version 03.1. Projects which apply the same measure as the proposed project have been determined and solar energy projects are selected as the same energy source type of projects. All the selected plants deliver the same service which is the electricity generation. Applicable output range has been determined and all the power plants are taken from the latest available year 2020. General Directorate of Energy Affairs and EMRA Electricity Production Licence Database have been used as a main resource. Therefore, all the compared power plants have been operational before the implementation of the project activity.

Below is a list of operational renewable energy projects started before 29/10/2020 as given by the General Directorate of Energy Affairs indicates that investments (counted as 192):

Table 7- Operational renewable energy projects

PLANT NAME	SOURCE TYPE	INSTALLED CAPACITY (MWe)	ELECTRICITY GENERATION (GWh)	REFERENCE OF REGISTRATION
Adacami HES	Hydropower	29.304	94.929	https://evident.app/IREC/device-register/ADACHYDR002
Bağıştaş II HES	Hydropower	48.600	181.25	https://evident.app/IREC/device-register/BAGIHYDR001
Gökkaya Barajı ve HES	Hydropower	28.540	103.34	https://registry.verra.org/app/projectDetail/VCS/1014
Himmetli Reg ve HES	Hydropower	26.980	102.19	https://registry.verra.org/app/projectDetail/VCS/1014
Feke I HES	Hydropower	29.400	117	https://registry.verra.org/app/projectDetail/VCS/533
Yalnızardıç HES	Hydropower	41.360	97.941	https://registry.verra.org/app/projectDetail/VCS/1409
Özlüce (Çoruh) HES	Hydropower	36.380	83.83	https://evident.app/IREC/device-register/%C3%96ZLHYDR001
Akşar-Nazar HES	Hydropower	30.240	108.2	https://projects.globalcarboncouncil.com/project/1190
Gürsöğüt Barajı ve HES	Hydropower	55.800	302.475	-
Günder HES	Hydropower	28.220	73.583	https://registry.verra.org/app/projectDetail/VCS/912
Muratlı Regülatörü ve HES	Hydropower	37.700	130.37	http://www.sercarbon.com/referanslarimiz/
Kayaköprü HES	Hydropower	38.600	132.781	-
Kıy HES	Hydropower	23.800	72.294	https://registry.verra.org/app/projectDetail/VCS/1108
Kale HES	Hydropower	29.250	108.728	https://registry.verra.org/app/projectDetail/VCS/1104
Düzce-Aksu HES	Hydropower	46.200	141.37	https://registry.verra.org/app/projectDetail/VCS/2095
Toros HES	Hydropower	49.990	208.57	https://registry.verra.org/app/projectDetail/VCS/1499
Kirazlık Reg. ve HES	Hydropower	46.111	150.61	https://registry.verra.org/app/projectDetail/VCS/2092
Ebru Reg. Ve HES	Hydropower	30.620	78.731	https://projects.globalcarboncouncil.com/project/79
Bucakkışla HES	Hydropower	41.000	160	https://registry.verra.org/app/projectDetail/VCS/1127
Devecikonağı Barajı ve HES	Hydropower	28.028	43.88	-
Ören Regülatörü ve HES	Hydropower	26.576	100.33	YEK-G
Çermikler Barajı ve HES	Hydropower	25.000	80.651	https://registry.verra.org/app/projectDetail/VCS/1050
Kalecik HES	Hydropower	27.500	88.04	https://registry.goldstandard.org/projects/details/1284
Serap HES	Hydropower	28.960	74.453	https://registry.goldstandard.org/projects/details/1701
Çakmak Reg. ve HES	Hydropower	27.380	43.49	https://evident.app/IREC/device-register/CAKMES30001
Eğlence II HES	Hydropower	27.200	78.019	https://registry.verra.org/app/projectDetail/VCS/1221
Eğlence I HES	Hydropower	43.500	127.28	https://registry.verra.org/app/projectDetail/VCS/1221

Topçam HES	Hydropower	61.350	200	https://projects.globalcarboncouncil.com/project/194
Doğançay HES	Hydropower	30.240	171.682	https://registry.verra.org/app/projectDetail/VCS/763
Papart Regülatörü ve HES	Hydropower	26.600	64.32	https://registry.verra.org/app/projectDetail/VCS/1300
Doğançay Reg. ve HES	Hydropower	61.950	168.98	https://registry.verra.org/app/projectDetail/VCS/763
Çambaşı Reg. ve HES	Hydropower	44.100	200.51	https://registry.goldstandard.org/projects/details/80
Alaköprü Barajı ve HES	Hydropower	31.568	129.47566	https://registry.verra.org/app/projectDetail/VCS/1412
Ceyhan HES	Hydropower	61.704	259	https://registry.verra.org/app/projectDetail/VCS/810
Çamlıca HES	Hydropower	22.652	75.509	https://evident.app/IREC/device-register/%C3%87AMHYDR001
Eren HES	Hydropower	35.186	141.8985517	https://registry.verra.org/app/projectDetail/VCS/1297
Niksar HES	Hydropower	40.160	247.65	https://registry.verra.org/app/projectDetail/VCS/1019
Çileklitepe HES	Hydropower	23.126	71.673	https://evident.app/IREC/device-register/%C3%87ILHYDR001
Çine Adnan Menderes HES	Hydropower	44.650	118	-
Balkusan HES	Hydropower	38.000	120.5	https://registry.verra.org/app/projectDetail/VCS/918
Çırakdamı Regülatörü ve Hes	Hydropower	49.100	140	https://registry.verra.org/app/projectDetail/VCS/1506
Dereli HES	Hydropower	49.200	157.5	https://registry.verra.org/app/projectDetail/VCS/1758
Sebil Reg. ve HES	Hydropower	22.636	116.671	-
Daran HES	Hydropower	67.160	278.057342	YEK-G
Midilli HES	Hydropower	32.548	124.05	https://registry.verra.org/app/projectDetail/VCS/1330
Ordu HES	Hydropower	42.000	156.499	YEK-G
Kılavuzlu HES	Hydropower	54.000	248	https://evident.app/IREC/device-register/KILAHYDR001
Muradiye Ayrancılar HES	Hydropower	41.454	168.96	https://registry.verra.org/app/projectDetail/VCS/577
Murat HES	Hydropower	35.628	150.39	https://registry.verra.org/app/projectDetail/VCS/1344
Garzan Barajı ve HES	Hydropower	52.000	219.58	https://evident.app/IREC/device-register/GARZHYDR001
Okkayası Regülatörleri Ve Şehitlik HES	Hydropower	22.708	56.83	https://fotonplatform.com/santraller/
Yedisu HES	Hydropower	22.710	72	https://registry.verra.org/app/projectDetail/VCS/752
Adıgüzel II HES	Hydropower	30.100	71.18	https://registry.verra.org/app/projectDetail/VCS/1427
Arpa HES	Hydropower	32.412	77.66	https://evident.app/IREC/device-register/ARPAHYDR002
Koçak Regülatörü ve HES	Hydropower	25.452	74.92	-
Çaykara HES	Hydropower	25.920	101.889	https://registry.verra.org/app/projectDetail/VCS/698

Çekerek HES	Hydropower	24.018	86.668	https://projects.globalcarboncouncil.com/project/367
Yaprak HES	Hydropower	24.280	71.387	https://registry.verra.org/app/projectDetail/VCS/1009
Umut Reg. Ve HES	Hydropower	42.250	124.894	https://registry.verra.org/app/projectDetail/VCS/1011
Tuna HES	Hydropower	37.190	100.783	https://registry.verra.org/app/projectDetail/VCS/668
Koçlu HES	Hydropower	36.260	121.117	https://registry.verra.org/app/projectDetail/VCS/2094
Burçak HES	Hydropower	66.290	223.87	-
Sırımtaş HES	Hydropower	27.234	73.53	https://evident.app/IREC/device-register/SIRIMH01
Angutlu I-II Reg. Ve HES	Hydropower	23.298	99.127	https://fotonplatform.com/santraller/
Ülkün Reg. ve HES	Hydropower	23.560	107.29	https://projects.globalcarboncouncil.com/project/217
Gökgedik Regülatörü ve HES	Hydropower	24.266	58.9	https://registry.verra.org/app/projectDetail/VCS/1459
Aksu (Yankol) HES	Hydropower	27.272	86.39	https://registry.verra.org/app/projectDetail/VCS/2095
Doruk Reg. ve HES	Hydropower	28.278	75.497	https://registry.verra.org/app/projectDetail/VCS/761
Söke-Çatalbük RES	Wind	30.000	102.59	https://registry.goldstandard.org/projects/details/1130
Akdağ RES	Wind	23.000	75	-
Airres-4 RES	Wind	55.000	192.5	https://registry.goldstandard.org/projects/details/1801
Alibey RES	Wind	30.000	105	https://projects.globalcarboncouncil.com/project/6
Kurtkayası RES	Wind	45.000	170.1	https://registry.goldstandard.org/projects/details/401
BAĞLAMA RES	Wind	50.000	200	https://registry.goldstandard.org/projects/details/2311
Uşak RES	Wind	61.500	457.2	https://registry.verra.org/app/projectDetail/VCS/1546
Yalova RES	Wind	54.000	155	https://registry.goldstandard.org/projects/details/188
Söke RES	Wind	45.000	175	https://registry.goldstandard.org/projects/details/525
Korkmaz RES	Wind	24.000	83.0053	https://registry.goldstandard.org/projects/details/14
Mordoğan RES	Wind	30.750	99.4092	https://registry.verra.org/app/projectDetail/VCS/1231
Çaypınar RES	Wind	24.000	96	https://registry.goldstandard.org/projects/details/2289
Kürek Dağı RES	Wind	32.500	113.88	https://fotonplatform.com/santraller/
Balabanlı RES	Wind	60.500	276.74	https://registry.goldstandard.org/projects/details/190
Bereketli RES	Wind	30.000	99.864	https://registry.goldstandard.org/projects/details/1634
Kıyıköy RES	Wind	44.000	157.5	https://registry.goldstandard.org/projects/details/227
Zeytineli RES	Wind	49.500	165	https://registry.goldstandard.org/projects/details/1221
Karova RES	Wind	30.000	122.5	https://registry.goldstandard.org/projects/details/528
Kavaklı RES	Wind	50.000	175	https://registry.goldstandard.org/projects/details/467

Sarpıncık RES	Wind	32.000	109.84	https://registry.goldstandard.org/projects/details/24
Sadıllı RES	Wind	33.000	115.5	https://registry.goldstandard.org/projects/details/146
Demircili RES	Wind	40.000	140	https://registry.goldstandard.org/projects/details/23
Kanije RES	Wind	48.000	168	https://registry.goldstandard.org/projects/details/373
Samurlu RES	Wind	43.900	153.8256	https://registry.goldstandard.org/projects/details/971
Kozbeyli RES	Wind	34.550	121.0632	https://registry.goldstandard.org/projects/details/1404
Tire RES	Wind	50.000	175	https://registry.goldstandard.org/projects/details/1703
Kartaldağı RES	Wind	63.000	184	https://registry.goldstandard.org/projects/details/1637
Havza RES	Wind	48.000	168	-
Umurlar RES	Wind	36.400	100.66	https://registry.goldstandard.org/projects/details/119
Dağpazarı RES	Wind	39.000	120	https://registry.goldstandard.org/projects/details/31
Şenköy RES	Wind	29.794	104.279	https://registry.goldstandard.org/projects/details/32
Çamınbaşı RES	Wind	27.000	94.5	https://registry.goldstandard.org/projects/details/2580
Kınık RES	Wind	50.000	165	https://registry.verra.org/app/projectDetail/VCS/1732
Ardıçlı RES	Wind	50.000	140.16	-
Mut RES	Wind	50.000	175	https://registry.goldstandard.org/projects/details/414
Fuatres RES	Wind	30.000	105	https://registry.goldstandard.org/projects/details/1633
Koru RES	Wind	50.000	182.6323	https://registry.goldstandard.org/projects/details/413
Harmanlık RES	Wind	50.000	152.5873	https://registry.goldstandard.org/projects/details/412
Taşpınar RES	Wind	60.000	236.52	https://registry.goldstandard.org/projects/details/1528
Gökres-2 RES	Wind	35.000	122.64	https://evident.app/IREC/device-register/G%C3%B6KWIND001
Kırkağaç RES	Wind	45.000	193.5	https://evident.app/IREC/device-register/K%C4%B1RWIND001
Geres RES	Wind	30.000	150	https://registry.goldstandard.org/projects/details/219
Gökzirve RES	Wind	25.200	88.2	https://projects.globalcarboncouncil.com/project/98
Atik RES	Wind	30.000	98.1285	https://registry.goldstandard.org/projects/details/52
Çakıl RES	Wind	31.550	116	https://evident.app/IREC/device-register/CAKIWIND001
Özbek RES	Wind	24.000	84	-
Elmalı RES	Wind	27.000	94.5	https://registry.goldstandard.org/projects/details/787
Hasanbeyli RES	Wind	50.000	216.8137	https://registry.goldstandard.org/projects/details/117
Kocalar RES	Wind	26.000	178.5	https://registry.verra.org/app/projectDetail/VCS/1905
İçdaş Biga RES	Wind	60.000	192.8952	https://registry.goldstandard.org/projects/details/372
Demirciler RES	Wind	23.300	80	https://registry.goldstandard.org/projects/details/582

Sarıtepe RES	Wind	50.000	202.3	https://registry.goldstandard.org/projects/details/583
Metristepe RES	Wind	40.000	140	https://registry.goldstandard.org/projects/details/52
Tayakadın RES	Wind	50.000	175	https://registry.goldstandard.org/projects/details/2347
Dilek RES	Wind	27.500	70	https://registry.goldstandard.org/projects/details/554
Kapıdağ RES	Wind	34.850	121.975	https://registry.goldstandard.org/projects/details/1277
KARLITEPE RES	Wind	30.000	120	https://projects.globalcarboncouncil.com/project/68
Uluborlu RES	Wind	60.000	240	https://registry.goldstandard.org/projects/details/606
Bafa RES	Wind	35.000	137.97	https://projects.globalcarboncouncil.com/project/102
Kirazlı RES	Wind	50.000	200	https://evident.app/IREC/device-register/KIRAWIND001
Denizli RES	Wind	66.000	245.4726	https://registry.goldstandard.org/projects/details/369
Hasanoba RES	Wind	51.000	254.5	https://registry.verra.org/app/projectDetail/VCS/1906
Bağarası RES	Wind	46.000	161	https://registry.goldstandard.org/projects/details/234
Manastır-Esenköy RES	Wind	30.450	106.575	https://fotonplatform.com/santraller/
Yeniköy RES	Wind	48.000	192	https://projects.globalcarboncouncil.com/project/1518
Mutlu RES 5 RES	Wind	44.000	176	https://registry.goldstandard.org/projects/details/151
Poyraz RES	Wind	30.000	99.864	https://evident.app/IREC/device-register/POYRWIND001
Eber RES	Wind	36.000	120.801672	https://registry.goldstandard.org/projects/details/933
Örlemiş RES	Wind	23.000	76.15944	https://registry.goldstandard.org/projects/details/1884
Petkim RES	Wind	25.000	133	https://evident.app/IREC/device-register/PETKMWD1
Poyraz RES	Wind	66.900	234.4176	https://registry.goldstandard.org/projects/details/1008
Çanta RES	Wind	50.000	175	https://registry.goldstandard.org/projects/details/144
Meryem RES	Wind	30.000	105	https://evident.app/IREC/device-register/MERYWIND001
Yamaçtepe-2 RES	Wind	30.000	105.12	-
Akyel-1 RES	Wind	40.000	140	https://registry.goldstandard.org/projects/details/2585
Gazi-9 RES	Wind	51.000	178.5	https://registry.goldstandard.org/projects/details/2586
Yahyalı RES	Wind	52.500	183.75	https://registry.goldstandard.org/projects/details/381
Sertavul RES	Wind	30.000	101.9664	https://registry.goldstandard.org/projects/details/1897
Silivri RES	Wind	45.000	323.74	https://registry.goldstandard.org/projects/details/729
Sincik RES	Wind	25.000	82.28746	https://registry.goldstandard.org/projects/details/446
Süloğlu RES	Wind	60.000	240	https://registry.goldstandard.org/projects/details/493
Amasya RES	Wind	42.000	148.08592	https://registry.goldstandard.org/projects/details/66

İncesu RES	Wind	27.200	95.2	https://registry.goldstandard.org/projects/details/301
Ödemiş RES	Wind	42.000	147	https://registry.goldstandard.org/projects/details/1963
Pazarköy RES	Wind	44.000	176	-
Poyrazgölü RES	Wind	42.000	147	https://evident.app/IREC/device-register/POYRWIND001
Bergama RES	Wind	25.000	88.2	https://projects.globalcarboncouncil.com/project/77
Karacabey RES	Wind	27.900	97.65	https://registry.verra.org/app/projectDetail/VCS/1569
Mersinli RES	Wind	55.000	192.5	https://registry.goldstandard.org/projects/details/1397
Yalova RES	Wind	50.000	175	https://registry.goldstandard.org/projects/details/188
Gülpınar RES	Wind	25.000	640	https://evident.app/IREC/device-register/G%C3%BCLWIND001
Şenbük RES	Wind	27.000	116.8125	https://registry.goldstandard.org/projects/details/165
Çerçikaya RES	Wind	57.000	221.55	https://registry.verra.org/app/projectDetail/VCS/1667
3S Kale Jes-1	Geothermal	25.000	200	https://evident.app/IREC/device-register/3SKATHER001
Kubilay JES	Geothermal	24.000	180	https://projects.globalcarboncouncil.com/project/568
PAMUKÖREN JES 2	Geothermal	22.510	180.08	https://registry.goldstandard.org/projects/details/1715
Pamukören JES 3	Geothermal	22.510	180.08	https://registry.goldstandard.org/projects/details/1715
Pamukören JES4	Geothermal	32.000	256	https://registry.goldstandard.org/projects/details/1715
Sultanhisar JES-2	Geothermal	22.510	180.08	https://evident.app/IREC/device-register/SULTES81001
Enerjeo Kemaliye Santrali	Geothermal	24.900	199.2	https://registry.verra.org/app/projectDetail/VCS/1231
Greeneco JES 6	Geothermal	26.000	191.36	https://evident.app/IREC/device-register/GREETHER004
Greeneco JES 5	Geothermal	28.050	206.448	https://evident.app/IREC/device-register/GREETHER003
Greeneco JES-3	Geothermal	25.600	204.8	https://evident.app/IREC/device-register/GREETHER002
Greeneco JES	Geothermal	25.600	204.8	https://evident.app/IREC/device-register/GREETHER001
Efe 6 JES	Geothermal	22.600	180.8	https://evident.app/IREC/device-register/EFE-THER001
Efe-7 JES	Geothermal	25.000	200	https://evident.app/IREC/device-register/EFE-THER002
Ken Kipaş Santrali	Geothermal	24.000	192	https://evident.app/IREC/device-register/KENKTHER001
KEN 3 JES	Geothermal	24.800	198.4	https://evident.app/IREC/device-register/KEN-THER001
Melih JES	Geothermal	33.000	264	https://evident.app/IREC/device-register/MELIHJES
Deniz (Maren II) JES	Geothermal	24.000	186	https://evident.app/IREC/device-register/DENITHER001
MEHMETHAN JES	Geothermal	24.800	194.8	https://evident.app/IREC/device-register/MEHMTHER001
Maren Santrali	Geothermal	44.000	350	https://registry.goldstandard.org/projects/details/1229
Kerem JES	Geothermal	24.000	192	https://evident.app/IREC/device-register/KERETHER001

Ala 2 JES	Geothermal	30.000	240	https://evident.app/IREC/device-register/ALAJTHER002
Dora III JES	Geothermal	34.000	220	https://evident.app/IREC/device-register/DORATHER003
Mis-III JES	Geothermal	48.000	384	https://evident.app/IREC/device-register/MIS3THER001
Salihli JES-2	Geothermal	24.500	196	https://evident.app/IREC/device-register/SALIJES2
Salihli JES 3	Geothermal	30.000	240	https://evident.app/IREC/device-register/SALIJES3
Özmen-1 JES	Geothermal	23.520	188.15	-
Türkerler Alaşehir JES	Geothermal	24.000	177.84	https://registry.goldstandard.org/projects/details/1716
Alaşehir JES 2	Geothermal	24.000	177.84	https://evident.app/IREC/device-register/ALASES81001
Alaşehir Jes	Geothermal	45.000	300	https://evident.app/IREC/device-register/ALASEHIR
CINGILLI GES	Solar	26.000	56.995251	https://evident.app/IREC/device-register/CINSEPSL
Teksin GES	Solar	33.124	66.24792	https://projects.globalcarboncouncil.com/project/307

Step 3: within the projects identified in Step 2, identify those that are neither registered CDM project activities, project activities submitted for registration, nor project activities undergoing validation. Note their number as Nall

Table 8- Renewable energy projects that are not registered

PLANT NAME	SOURCE TYPE	INSTALLED CAPACITY (MWe)	ELECTRICITY GENERATION (GWh)
Gürsöğüt Barajı ve HES	Hydropower	55.800	302.475
Kayaköprü HES	Hydropower	38.600	132.781
Devecikonağı Barajı ve HES	Hydropower	28.028	43.88
Çine Adnan Menderes HES	Hydropower	44.650	118
Sebil Reg. ve HES	Hydropower	22.636	116.671
Koçak Regülatörü ve HES	Hydropower	25.452	74.92
Burçak HES	Hydropower	66.290	223.87
Akdağ RES	Wind	23.000	75
Havza RES	Wind	48.000	168
Ardıçlı RES	Wind	50.000	140.16
Özbek RES	Wind	24.000	84
Yamaçtepe-2 RES	Wind	30.000	105.12
Pazarköy RES	Wind	44.000	176
Özmen-1 JES	Geothermal	23.520	188.15

N_{all} = 14

Step 4: within similar projects identified in Step 3, identify those that apply technologies that are different to the technology applied in the proposed project activity. Note their number as Ndiff

There is no such solar power plant which is in the range determined for Arısu Solar Power Plant (i.e., 22.50MW to 67.50 MW) that are neither registered nor undergoing validation. Details are given in common practice analysis submitted to DOE and GS.

N_{diff} = 14

Step 5: calculate factor F=1-Ndiff/Nall representing the share of similar projects (penetration rate of the measure/technology) using a measure/technology similar to the measure/technology used in the proposed project activity that deliver the same output or capacity as the proposed project activity.

F=1- N_{diff}/N_{all}=1-(14/14) = 0 (< 0.2)

N_{all}– N_{diff} = 14 – 14 = 0 (< 3)

According to "Tool for Common practice", Version 03.1, if the factor F is greater than 0.2 and Nall-Ndiff is greater than 3, then the proposed project is a "common practice".

Given the fact that all there is no plants like the proposed project and built without carbon revenue, the proposed type of project should not be considered as a common practice in Turkey. Hence, the proposed project is additional.

B.5.1 Prior Consideration

The start date of the project is 28/05/2020 and first submission date of the project is 20/01/2020, which is prior to the start date. Thus, no prior consideration is needed.

Table 9- Milestones of Arisu SPP Regarding Prior Consideration

Milestone	Date
First Submission to GS	20/01/2020
Generation License	28/05/2020

Project Start Date (EPC Contract)	28/05/2020
Commissioning of the Plant (Provisional Acceptance No.1)	28/10/2020
Full Commissioning of the Plant (Provisional Acceptance No.5)	19/08/2021
Stakeholder Consultation Report	30/05/2022

B.5.2 Ongoing Financial Need

N/A

B.6. Sustainable Development Goals (SDG) outcomes

Relevant Target/Indicator for each of the three SDGs

Sustainable Development Goals Targeted	Most relevant SDG Target	SDG Impact Indicator (Proposed or SDG Indicator)
13 Climate Action (mandatory)	13.2: "Integrate climate change measures into national policies, strategies and planning"	Amount of GHGs emissions avoided or sequestered
7 Affordable and Clean Energy	7.2: "By 2030, increase substantially the share of renewable energy in the global energy mix"	Total electricity produced: Renewable
8 Decent Work and Economic Growth	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"	Total number of jobs

B.6.1 Explanation of methodological choices/approaches for estimating the SDG Impact

SDG 7: Affordable and Clean Energy (Ensure access to affordable, reliable, sustainable, and modern energy for all)

The baseline for the project is no project, thus leading to generation in the relevant grid which is dominated by fossil fuel, and this is one of the methodological reasons for choosing simple OM method to calculate emission factor. The clean energy generated by the project is calculated based on the amount of electricity generated by the project per annum. The project is expected to generate 109.237 GWh of clean energy per annum and contributes to share of low-cost / must-run sources. Hence, contribution of the project could be followed via indicator 7.2.1 "Renewable energy share in the total final energy consumption" and following target: 7.2 ''By 2030, increase substantially the share of renewable energy in the global energy mix". This project increases the renewable energy sharing of global energy mix and contribute to improved air quality by reducing air pollution.

SDG 8: Decent Work and Economic Growth (Promote sustained, inclusive and sustainable economic growth, full and productive employment and decent work for all)

The project is expected to create job opportunity for at least 19 people. It contributes to decent work and economic growth and quality of employment via providing required trainings. Employment and training record will be used for checking the SDG 8 outcome.

SDG13: Climate Action (Taking urgent action to combat climate change and its impacts)

Emission factor for the baseline scenario which was calculated by the Ministry of Environment and Urbanization has been used. Accordingly, the project leads to mitigation of 70,873 tCO2 per annum.

B.6.2 Data and parameters fixed ex ante

SDG13

Data/parameter	$EF_{CM,y}$
Unit	tCO_2/MWh
Description	Combined margin emission factor
Source of data	Tool 07 Tool to calculate the emission factor for an electricity system
Value(s) applied	0.6488
Choice of data or Measurement methods and procedures	Emission factor for the baseline scenario which was calculated by the Ministry of Environment and Urbanization has been used.

Purpose of data	To calculate baseline emission
Additional comment	-

B.6.3 Ex ante estimation of SDG Impact

Ex-ante emission reductions (ER_y) are calculated as follows:

$$ER_y = BE_y - PE_y - LE_y$$

Where:

ER_y = Emission reductions in year y (tCO_2)
BE_y = Baseline emissions in year y (tCO_2)
PE_y = Project Emissions in year y (tCO_2)
LE_y = Leakage emissions in year y (tCO_2)

Baseline emission is calculated according to the formula:

$$BE_y = EG_y \times EF_y$$

Where:

EG_y = Net electricity delivered to the grid by the project activity in year y excluding transmission losses of the grid (data is gathered from energy yield assessment report of the project which is 109,237 MWh)

EF_y = Emission factor calculated according to selected methodology (Combined margin value was calculated by using nationally accepted emission factors. Republic of Turkey Ministry of Energy and Natural Resources released them on 20/09/2020)[34]

Combined margin is calculated as follows:

CM = (OM x 0.75) + (BM x 0.25)

(0.7424 x 0.75) + (0.3680 x 0.25) = 0.6488 tCO_2/MWh

BE_y = 109,237 MWh × 0.6488 tCO2e/MWh = 70,873 tCO2e

[34] https://enerji.gov.tr//Media/Dizin/EVCED/tr/%C3%87evreVe%C4%B0klim/%C4%B0klimDe%C4%9Fi%C5%9Fikli%C4%9Fi/TUESEmisyonFktr/Belgeler/Bform2020.pdf

Project emissions

Since the project is classified as a renewable energy project, parameter PE_y is neglected.

Therefore: $PE_y = 0$

Leakage

The energy generating equipment is not transferred from or to another activity. Therefore, leakage is also considered as "0".

$LE_y = 0$

As a result, Total Emission Reduction is:

$ER_y = BE_y$

SDG7

The average annual clean energy generation is expected to be 109.237 GWh.

SDG8

The project creates job opportunities for at least 19 people.

SDG13

The annual emission reduction is expected to be 70,873 tCO_2e.

B.6.4 Summary of ex ante estimates of each SDG Impact

SDG 13

Year	Baseline estimate	Project estimate	Net benefit
29/10/2020-31/12/2020 (64 days)	12,427	0	12,427
2021	70,873	0	70,873
2022	70,873	0	70,873
2023	70,873	0	70,873
2024	70,873	0	70,873
01/01/2025-28/10/2025 (302 days)	58,446	0	58,446

Total	354,365		354,365
Total number of crediting years	5 years		
Annual average over the crediting period	**70,873**	**0**	**70,873**

SDG 7

Year	Baseline estimate	Project estimate	Net benefit
29/10/2020-31/12/2020 (64 days)	0	19,154	19,154
2021	0	109,237	109,237
2022	0	109,237	109,237
2023	0	109,237	109,237
2024	0	109,237	109,237
01/01/2025-28/10/2025 (301 days)	0	90,083	90,083
Total	0	546,185	546,185
Total number of crediting years	5 years		
Annual average over the crediting period	**0**	**109,237**	**109,237**

SDG8

Year	Baseline estimate	Project estimate	Net benefit
29/10/2020 - 28/10/2025	**0 Employment Opportunities**	**19 Employment Opportunities**	**19 Employment Opportunities**

B.7. Monitoring plan

B.7.1 Data and parameters to be monitored

SDG 7

<table>
<tr><td>Data / Parameter</td><td>$EG_{facility, y}$</td></tr>
<tr><td>Unit</td><td>GWh</td></tr>
<tr><td>Description</td><td>Net electricity generated and delivered to the grid by the proposed project in year</td></tr>
<tr><td>Source of data</td><td>Metering devices used in power plants & monthly generation records
Main source will be EPIAS records and meter readings will be used for cross-check</td></tr>
<tr><td>Value(s) applied</td><td>Estimated annual generation forming the basis for emission reduction calculation is 109,237,000 kWh</td></tr>
<tr><td>Measurement methods and procedures</td><td>Generation data is recorded by two metering devices continuously. These records provide the data for the monthly invoicing to TEIAS (Turkish Electricity Transmission Corporation - Türkiye Elektrik İletim A.Ş.). Generation is recorded via remote reading system. The quantity of electricity supplied by the project plant/unit to the grid (ISVM) and the quantity of electricity delivered to the project plant/unit from the grid (EUCM) are measured. Net generation is calculated via subtracting energy delivered by the project activity to the grid for internal consumption from electricity fed to the grid.
Properties of the meters are given in the table below.
<table>
<tr><th></th><th>Main Meter</th><th>Spare Meter</th></tr>
<tr><td>Serial No.</td><td>9674591</td><td>9674592</td></tr>
<tr><td>Brand</td><td>EMH</td><td>EMH</td></tr>
<tr><td>Type</td><td>LZQJ-XC</td><td>LZQJ-XC</td></tr>
<tr><td>Class</td><td>0.5S</td><td>0.5S</td></tr>
</table>
</td></tr>
<tr><td>Monitoring frequency</td><td>Continuous measuring, monthly recording</td></tr>
<tr><td>QA/QC procedures</td><td>Two calibrated meters backup each other. Maintenance and calibration of the metering devices are made by TEIAS. If there is a significant difference between the readings of two devices, maintenance and tests of the</td></tr>
</table>

	metering devices and the associated equipment are done before waiting for the periodical maintenance. The meters should comply with EMRA regulations which define the accuracy class of the meters as 0.2 or 0.5 depending on the capacity of the circuit as given in document in link (http://www.epdk.gov.tr/web/elektrik-piyasasi-dairesi/44). Generation of the plant is cross checked from TEIAS - EPIAS web site which is accessible using a password provided to electricity generation companies. Readings are done using main metering devices and spare metering devices are used for comparison only. ISVM (Electricity fed to the grid) and UECM (Electricity consumed from the grid) data given in EPIAS records are used for emission reduction calculations. According to the System Use Agreement with TEIAS, testing of the meters are done every 2 years. Calibration frequency of the meters are 10 years. If the meters fail the test, they are calibrated, without waiting for the due date in 10 years.
Purpose of data	Emission reduction calculations
Additional comment	-

SDG 8

Data / Parameter	Quantitative employment and income generation
Unit	Number of locally recruited staff and their social security records
Description	Ensuring that the staff receives their full salaries on time.

Source of data	Social Security Records to be provided by the Project Owner
Value(s) applied	The project is expected to create job opportunity for at least 19 people.
Measurement methods and procedures	The project owner is committed to ensuring that the staff receives their full salaries on time. Number of employees and the evidence for their wages being paid will be checked from the social security records, which will be provided by the Project Owner.
Monitoring frequency	Annually
QA/QC procedures	-
Purpose of data	To monitor the contribution to SDG 8 and Principle 3.6.1.
Additional comment	-

SDG 13

Data / Parameter	Emissions Reductions in tCO2
Unit	tCO2
Description	Reduction of CO2 emissions due to implementation of project activity
Source of data	Electricity generated by Antalya Solar Power Plant and calculated combined margin (CM) emission factor will be used as reference in calculation of the emission reduction.
Value(s) applied	Estimated annual emission reduction is 70,873 tonnes of CO2 The applied OM & BM for the project are: Operating Margin: 0.7424 tCO2/MWh Build Margin: 0.3680 tCO2/MWh Therefore, the applied Combined margin for the project is 0.6488 tCO2/MWh.

	Emission factor is calculated by using National electricity grid emission factors and is calculated as 0.6488 tCO2/MWh. Estimated annual emission reduction is 70,873 tonnes of CO_2.
Measurement methods and procedures	The net electricity supplied by the Project will be continuously measured and recorded by EPIAS; and will be kept by the Project Owner. In addition to the EPIAS meters which is used for billing purposes, records taken by meters using at project site will be used for comparison.
Monitoring frequency	Once every monitoring period
QA/QC procedures	-
Purpose of data	To calculate the baseline emission value; and, to monitor the contribution to SDG 13 (Take urgent action to combat climate change and its impacts)
Additional comment	-

Data / Parameter	Quality of Employment
Unit	Number of personnel certified/trained during operation phase
Description	Contribution to quality of employment by ensuring that the staff is trained and certified for the required positions
Source of data	Training Records (including H&S) & Other Certificates required by certain professions, if necessary
Value(s) applied	Some of the trainings & workshops that may be given to the respective employees are: • For Construction period • General Health and Safety • Emergency action plan

	• General work safety and legal responsibility / health and safety signs/danger and risks in working area • Work safety for lifting equipment • For operation period • ISO 9000:2008 Quality Management System • ISO 14001 Environment Management System and OHSAS 18001 Health and Safety Management System • Analysing and Assessment of Risk • SPP Rescue Training • First aid • Training of working aloft • Defensive driving • Fire extinguishing
Measurement methods and procedures	All employees will attend trainings on first aid and health & safety. For positions that require specific skills (such as high voltage equipment) staff will either be trained, or certified staff will be recruited.
Monitoring frequency	Annually
QA/QC procedures	The training programmes help increase the efficiency of the workforce and provides employees skilled at their job. This not only helps the company but to self-improvement of individual employees.
Purpose of data	To monitor the contribution to SDG 8 and Principle 3.6.1.
Additional comment	-

Data / Parameter	Principle 9.4 Release of Pollutants - Water Quality and Quantity
Unit	-

Description	Appropriate disposal of wastewater as required by the Law on Water Pollution Control[35]
Source of data	Assessing collection methods during site visits and checking wastewater disposal records.
Value(s) applied	No wastewater production in the baseline scenario
Measurement methods and procedures	Domestic wastewater generated at the project site is handled according to the national regulations on handling domestic waste
Monitoring frequency	Annually
QA/QC procedures	Operation is in line with national regulations
Purpose of data	To monitor the contribution to Principle 9.4.
Additional comment	-

Data / Parameter	Principle 9.11 Endangered Species - Biodiversity
Unit	-
Description	Ensuring that the project creates no disturbance to the regional habitat
Source of data	Assessments during site visits and ecosystem reports
Value(s) applied	No disturbance to the regional habitat in the baseline scenario
Measurement methods and procedures	Ecosystem reports will be checked.
Monitoring frequency	Annually
QA/QC procedures	-
Purpose of data	To contribute to Principle 9.11
Additional comment	-

[35] Law on Water Pollution Control. Official Gazette Date & No.: 31/12/2004 & 25687. https://www.mevzuat.gov.tr/mevzuat?MevzuatNo=7221&MevzuatTur=7&MevzuatTertip=5

Data / Parameter	Principle 9.5 Hazardous and Non-hazardous Waste - Waste Oil
Unit	-
Description	Proper management of waste oil
Source of data	Assessing disposal methods during site visits and checking waste oil disposal records.
Value(s) applied	No waste oil during baseline situation.
Measurement methods and procedures	Project owner committed to proper collection of waste oil from equipment in line with regulation # 26952 on control of waste oils. There is no waste oil generated so far.
Monitoring frequency	Annually
QA/QC procedures	-
Purpose of data	To contribute to Principle 9.5
Additional comment	-

Data / Parameter	Principle 4.2.2 Climate and Energy – Soil Condition
Unit	-
Description	Control of erosion
Source of data	Assessing soil condition during site visits
Value(s) applied	No erosion during baseline situation
Measurement methods and procedures	Soils resistance to erosion will be improved. Soils permeability, water pressure formation and seepage will be monitored.
Monitoring frequency	Once in the first verification
QA/QC procedures	-
Purpose of data	To contribute to Principle 4.2.2
Additional comment	-

Data / Parameter	Principle 4.3.4 Release of pollutants – Soil Condition
Unit	-
Description	Proper management of solid wastes
Source of data	Assessing disposal methods during site visits
Value(s) applied	No solid waste during baseline situation
Measurement methods and procedures	Domestic solid wastes will be collected and handled according to the Solid Waste Control Regulation. They will be collected and transferred to the municipality's solid waste storage facility, periodically.
Monitoring frequency	Once every monitoring period
QA/QC procedures	-
Purpose of data	To contribute to Principle 4.3.4
Additional comment	-

Data / Parameter	Principle 3.4.3 Cultural Heritage, Indigenous Peoples, Displacement and Resettlement - Expropriation of the project site
Unit	-
Description	Land acquisition
Source of data	Permit documents will be checked
Value(s) applied	No expropriation during baseline situation
Measurement methods and procedures	Some parcels of the project area belong to Treasury while others are the lands owned by individuals. Permission documents of the project site to be used for purposes other than agriculture. Land acquisition will be done according to the Turkish Expropriation Laws and Electricity Market Law (4628).
Monitoring frequency	Once in the first verification
QA/QC procedures	-
Purpose of data	To contribute to Principle 3.4.3
Additional comment	-

B.7.2 Sampling plan

No sampling plan will be necessary.

B.7.3 Other elements of monitoring plan

Monitoring is a key procedure to verify the real and measurable emission reductions from the proposed project. To guarantee the proposed project's real, measurable, and long-term GHG emission reductions, the monitoring plan is established.

Net electricity generation will be measured and recorded via meters sealed by TEIAS for billing purposes therefore no new additional protocol will be needed for monitoring emission reduction. Power Plant Manager will be responsible for the electricity generated, gathering all relevant data, and keeping the records.

Generation data collected during crediting period will be submitted to GTE who will be responsible for calculating the emission reduction subject to verification. Generation data will be used to prepare monitoring reports which will be used to determine the vintage from the project activity. These reports will be submitted to the duly authorized and appointed "Validation/Verification Body" Operational Entity 'VVB' before each verification period.

VER Team Members is expected to include the following staff:

Plant Manager: Responsible for running the plant and compliance with VER monitoring plan
Accounting Manager: Responsible for keeping data about generation and consumption.
GTE: Responsible for emission reduction calculations, preparing monitoring report and periodical verification process.

Installation of meter and data monitoring will be carried out according to the regulations by TEIAS. Two metering devices (one of them used as spare) will be used for monitoring the electricity generated by the power plant. Readings will be done using main metering devices and spare metering device will be used for comparison only. Data from metering devices will be recorded by TEIAS monthly (through remote reading). In addition to the two metering devices, generation of the plant can be cross checked from EPIAS web site (https://www.epias.com.tr/) which is accessible using a password provided to electricity generation companies. EPIAS records will be used for emission reduction calculations.

Properties of metering devices are given in the table below.

Table 10- Properties of metering devices

	Main Meter	Spare Meter
Brand	EMH	EMH

Type	LXQJ-XC	LXQJ-XC
Serial Number	9674591	9674592
Accuracy Class	0.5S	0.5S

All data will be kept for at least two years after the crediting period for QA/QC purposes.

The calibration and maintenance of the meters will be carried out in line with the by law on Metering and Metering Devices[36]. TEIAS is the owner of the meters and is responsible for the calibration of them. TEIAS (Turkish Electricity Transmission Corporation - Türkiye Elektrik İletim A.Ş.)

SECTION C. DURATION AND CREDITING PERIOD

C.1. Duration of project

C.1.1 Start date of project

Start date of project activity is 28/05/2020 which corresponds to the date of EPC Contract (as also indicated in the Milestones table).

C.1.2 Expected operational lifetime of project

The operational lifetime of the project is expected about 49 years.

C.2. Crediting period of project

C.2.1 Start date of crediting period

The start date of operation is 28/10/2020[37]. Thus, first crediting period is chosen to be between 29/10/2020 and 28/10/2025.

C.2.2 Total length of crediting period

The crediting period will be valid for 5 years and renewed twice. Thus, total length of crediting period will be 15 years.

[36] https://www.mevzuat.gov.tr/anasayfa/MevzuatFihristDetayIframe?MevzuatTur=7&MevzuatNo=6381&MevzuatTertip=5

[37] It is the date of first provisional acceptance, meaning the commissioning of first set of solar panels. On this date, the plant starts selling electricity. The date of Provisional Acceptance No.1 is also indicated in the Milestones table.

SECTION D. SUMMARY OF SAFEGUARDING PRINCIPLES AND GENDER SENSITIVE ASSESSMENT

D.1 Safeguarding Principles that will be monitored

A completed Safeguarding Principles Assessment is in Appendix 1, ongoing monitoring is summarized below.

Principles	Mitigation Measures added to the Monitoring Plan
Principle 4.3.4: Release of pollutants **Water Quality and Quantity**	Collection methods and waste disposal records will be checked during site visits. Appropriate disposal of wastewater will be done as required by the Law on Water Pollution Control. Parameter will be checked annually.
Principle 4.3.11: Endangered Species **Biodiversity**	No disturbance to the regional habitat by the project will be ensured. Assessments during site visits will be done and ecosystem reports will be checked. Parameter will be checked annually.
Principle 4.3.5: Hazardous and Non-hazardous Waste **Other Pollutants (Waste oil)**	Waste oil from equipment will be collected properly in line with the relevant regulation and disposed via accredited abatement companies. Waste oil will be disposed in line with regulation # 26952 on control of waste oils[38] .
Principle 4.2.2 Climate and Energy **Soil Condition**	Erosion control will be set by intensifying local characteristics.[39] Soils resistance to erosion will be improved. Soils permeability, water pressure formation and seepage will be monitored. Site observations will be

[38] Regulation: *Atık Yağların Kontrolü Yönetmeliği*, numbered 26952, dated 30.07.2008
http://www.mevzuat.gov.tr/Metin.Aspx?MevzuatKod=7.5.12290&MevzuatIliski=0&sourceXmlSearch

[39] Antalya SPP EIA, page 97

	done during the site visit. This parameter will be checked once in the first verification.
Principle 4.3.4 Release of pollutants **Soil Condition**	Domestic solid wastes will be collected and handled according to the Solid Waste Control Regulation. They will be collected and transferred to the municipality's solid waste storage facility, periodically. Domestic wastewater generated will be collected in a cesspool and then conveyed to the closest wastewater treatment system. Appropriate disposal of solids waste as required by the Law on Solid Waste Management[40]. This parameter will be checked at every verification.
Principle 3.4.3 Cultural Heritage, Indigenous Peoples, Displacement and Resettlement **Expropriation of the project site**	Some parcels of the project area belong to Treasury while others are the lands owned by individuals.[41] Permission documents of the project site to be used for purposes other than agriculture. Land acquisition will be done according to the Turkish Expropriation Laws and Electricity Market Law (4628). This parameter will be checked once at first verification.

D.2. Assessment that project complies with GS4GG Gender Sensitive requirements

Question 1 - Explain how the project reflects the key issues and requirements of Gender Sensitive design and implementation as outlined in the Gender Policy?	Project participants are not involved and promote any discrimination about the gender differences and provides equal opportunity, social inclusion, and female empowerment. Equality of opportunity is

[40] https://www.resmigazete.gov.tr/eskiler/2015/04/20150402-2.htm

[41] Antalya SPP EIA, page 15

	one of the key issues in companies' human resources policies[42].
Question 2 - Explain how the project aligns with existing country policies, strategies, and best practices	Turkey has ratified ILO convention 100 and 111 and discrimination based on gender is illegal in Turkey. The project tries to align with the national gender strategy. So, the Project does not involve and is not complicit in any form of discrimination based on gender difference.
Question 3 - Is an Expert required for the Gender Safeguarding Principles & Requirements?	No, an Expert is not required.
Question 4 - Is an Expert required to assist with Gender issues at the Stakeholder Consultation?	No, an Expert is not required.

SECTION E. SUMMARY OF LOCAL STAKEHOLDER CONSULTATION

The below is a summary of the 2 step GS4GG Consultation for monitoring purposes. Please refer to the separate Stakeholder Consultation Report for a complete report on the initial consultation and stakeholder feedback round.

E.1 Summary of stakeholder mitigation measures

EIA Stakeholder Meeting took place on 23/01/2017 at Arısu Taziye Evi in Tuşba, in city of Van. Participants were among:

- Directorate General of Environmental Impact Assessment, Permit and Inspection,
- Van Provincial Directorate of Environment and Urbanisation
- Van Metropolitan Municipality
- Gün Güneş Enerjisi Elektrik Üretim San. Tic. A.Ş.,
- Almer Proje Ltd. Şti.,

[42] http://eng.calikenerji.com/Pages/%C4%B0nsan%20Kaynaklar%C4%B1.aspx

- Village mukhtars and
- Local people.

A presentation was given to the participants on the solar power plant and the planned actions. Participants' questions were answered by Almer Proje Ltd. Şti. ve Gün Güneş Enerjisi Elektrik Üretim San. Tic. A.Ş. representatives and the procedures to be followed were explained in detail[43].

Participants were given the opportunity to ask their questions and raise their concerns. Local residents among the participants objected, pointing out that the project area is pastureland. Local residents mentioned their concerns on how the project would affect their animal husbandry activities. They demanded project location to be reconsidered and re-evaluated.

E.2 Final continuous input / grievance mechanism

Method	Include all details of Chosen Method (s) so that they may be understood and, where relevant, used by readers.
Continuous Input / Grievance Expression Process Book (mandatory)	A logbook has been provided to the Mukhtar of the Arısu Village. The record of the delivery has been submitted to the DOE. The contact information provided in the logbook can be seen below: Gün Güneş Enerjisi Elektrik Üretim Sanayi ve Ticaret A.Ş Tel: +90 212 267 42 06 E-mail: alpay.beyla@boydakenerji.com
GS Contact (mandatory)	help@goldstandard.org
Other	

[43] Arısu SPP EIA, page 123

APPENDIX 1 - SAFEGUARDING PRINCIPLES ASSESSMENT

Complete the Assessment below and copy all Mitigation Measures for each Principle into SECTION D above. Please refer to the instructions in the Guide to Completing this Form.

Assessment Questions/ Requirements	Justification of Relevance (Yes/potentially/no)	How Project will achieve Requirements through design, management, or risk mitigation.	Mitigation Measures added to the Monitoring Plan (if required)
Principle 1. Human Rights			
1. The Project Developer and the Project shall respect internationally proclaimed human rights and shall not be complicit in violence or human rights abuses of any kind as defined in the Universal Declaration of Human Rights 2. The Project shall not discriminate with regards to participation and inclusion	1.No 2.No	1.Project activities are not expected to cause any human rights abuse. Turkey has ratified European Convention on Human Right in 10/03/1954[44] 2. The Project does not involve and is not complicit in any form of discrimination with regards to	1.No mitigation measure is required for this indicator. 2.No mitigation measure is required for this indicator.

44 http://www.ihd.org.tr/avrupa-insan-haklari-sozlesmesi-ve-eki-protokollerde-yer-alan-haklar-ve-ozgurlukler/

		participation and inclusion. Turkey has ratified ILO convention 100, 111, 122 and 142, which provides gender equality and promotes women's employment[45].	
Principle 2. Gender Equality			
1. The Project shall not directly or indirectly lead to/contribute to adverse impacts on gender equality and/or the situation of women 2. Projects shall apply the principles of non-discrimination, equal treatment, and equal pay for equal work 3. The Project shall refer to the country's national gender strategy or equivalent national	1.No 2.No 3.No 4.No	The Project shall apply the principles of non-discrimination, equal treatment, and equal pay for equal work. The Project activities do not involve and is not complicit in any form of discrimination based on gender. Turkey has ratified ILO convention 100, 111, 122 and 142, which provides gender equality and promotes women's	1.No mitigation measure is required for this indicator. 2.No mitigation measure is required for this indicator. 3.No mitigation measure is required for this indicator. 4.No mitigation measure is required for this indicator.

[45] http://www.ilo.org/ankara/areas-of-work/equality-discrimination/lang--tr/index.htm

commitment to aid in assessing gender risks 4. (Where required) Summary of opinions and recommendations of an Expert Stakeholder(s)		employment46; and also, has ratified European Convention on Human Right in 10/03/195447, which includes the right to life as well as prohibition of torture, slavery, discrimination and forced labour.	
Principle 3. Community Health, Safety and Working Conditions			
The Project shall avoid community exposure to increased health risks and shall not adversely affect the health of the workers and the community	No	Turkey has ratified ILO convention 155 and about work safety and precautions[48]	Staff will be trained during construction
Principle 4.1 Sites of Cultural and Historical Heritage			
Does the Project Area include sites, structures, or objects with historical, cultural, artistic, traditional or religious values or intangible forms of culture?	No	No sites, structures, or objects with historical, cultural, artistic, traditional, or religious values or	No mitigation is required for this indicator.

[46] http://www.ilo.org/ankara/areas-of-work/equality-discrimination/lang--tr/index.htm

47 http://www.ihd.org.tr/avrupa-insan-haklari-sozlesmesi-ve-eki-protokollerde-yer-alan-haklar-ve-ozgurlukler/

[48] https://www.ilo.org/global/standards/subjects-covered-by-international-labour-standards/occupational-safety-and-health/WCMS_356966/lang--en/index.htm

		intangible forms of culture were observed in the project area.[49]	
Principle 4.2 Forced Eviction and Displacement			
Does the Project require or cause the physical or economic relocation of peoples (temporary or permanent, full or partial)?	No	For the project resettlement is not required. The closest settlement is Arısu Neighbourhood which is 1000 m distant from the project area.[50]	No mitigation is required for this indicator.
Principle 4.3 Land Tenure and Other Rights			
a. Does the Project require any change, or have any uncertainties related to land tenure arrangements and/or access rights, usage rights or land ownership? b. For Projects involving land use tenure, are there any uncertainties with regards to land tenure, access rights, usage rights or land ownership?	a. No b. No	a. Land acquisition will be done according to the Turkish Expropriation Laws and Electricity Market Law (4628). There will be no action until all permissions are taken. b. Land acquisition will be done according to the Turkish Expropriation Laws and	a. No mitigation is needed for this indicator. b. No mitigation is needed for this indicator.

[49] Arısu SPP EIA, page 47
[50] Arısu SPP EIA, page 129

		Electricity Market Law (4628). There will be no action until all permissions are taken.	
Principle 4.4 - Indigenous people			
Are indigenous peoples present in or within the area of influence of the Project and/or is the Project located on land/territory claimed by indigenous peoples?	No	No indigenous peoples were identified.	No mitigation is required for this indicator.
Principle 5. Corruption			
1. The Project shall not involve, be complicit in or inadvertently contribute to or reinforce corruption or corrupt Projects	No	Turkey has ratified several conventions on bribery and Corruption including OECD and UN conventions.[51]	No mitigation measure is required for this indicator.
Principle 6.1 Labour Rights			
1. The Project Developer shall ensure that all employment follows national labour occupational health and safety laws and with the	1.No 2.No 3.No 4.No	1.The project activity does not have any restrictions on employees' freedom. Turkey has ratified ILO convention 29 and	1.No mitigation measure is required for this indicator. 2.No mitigation measure is required for this indicator.

[51] http://www.masak.gov.tr/en/laundering-proceeds-of-crime/national-combat/4208-on-Prevention-of-Money- Laundering.aspx

principles and standards embodied in the ILO fundamental conventions 2. Workers shall be able to establish and join labour organisations 3. Working agreements with all individual workers shall be documented and implemented and include: a) Working hours (must not exceed 48 hours per week on a regular basis), AND b) Duties and tasks, AND c) Remuneration (must include provision for payment of overtime), AND d) Modalities on health insurance, AND e) Modalities on termination of the contract with		105 on forced and compulsory labour[52]. Turkey has also ratified ILO 87 and 98 conventions on establishing and joining labour organisations. All staff recruited are employed according to the national legislations[53]. During the construction and operation phases, local people will have priority in terms recruitment. Turkey has also ratified ILO 182 Convention about Child Labour[54]. All ratified ILO Conventions will be complied with during the Project activities.	3.No mitigation measure is required for this indicator.

52 http://www.ilo.org/public/turkish/region/eurpro/ankara/about/sozlesmeler.htm

53 http://www.ilo.org/public/turkish/region/eurpro/ankara/about/sozlesmeler.htm

54 https://www.ilo.org/ankara/conventions-ratified-by-turkey/WCMS_377311/lang--tr/index.htm

provision for voluntary resignation by employee, AND f) Provision for annual leave of not less than 10 days per year, not including sick and casual leave. 4. No child labour is allowed (Exceptions for children working on their families' property requires an Expert Stakeholder opinion) 5. The Project Developer shall ensure the use of appropriate equipment, training of workers, documentation and reporting of accidents and incidents, and emergency preparedness and response measures		Plus, the project owner is committed to the safe and healthy working conditions during all phases of the project. All employees will attend trainings on first aid and health & safety. For positions that require specific skills (such as high voltage equipment) staff will either be trained, or certified staff will be recruited. The project owner is also committed to ensuring that the staff receives their full salaries on time.	
Principle 6.2 Negative Economic Consequences			
1. Does the project cause negative economic consequences during and after project implementation?	No	The project does not cause any negative consequences after implementation. On the contrary, it will create job opportunities for locals as a positive economic impact.	No mitigation measure is needed.

Principle 7.1 Emissions			
Will the Project increase greenhouse gas emissions over the Baseline Scenario?	No	Since it is a solar energy power plant, the project is expected to have a positive impact on Climate Change by eliminating fossil fuels.	No mitigation measure is required for this indicator.
Principle 7.2 Energy Supply			
Will the Project use energy from a local grid or power supply (i.e., not connected to a national or regional grid) or fuel resource (such as wood, biomass) that provides for other local users?	No	Project does not use any local fuel resource. It is connected to the national grid and supply 109.237 GWh additional energy to the grid.	No mitigation measure is required for this indicator.
Principle 8.1 Impact on Natural Water Patterns/Flows			
Will the Project affect the natural or pre-existing pattern of watercourses, groundwater and/or the watershed(s) such as high seasonal flow variability, flooding potential, lack of aquatic connectivity or water scarcity?	No	The project does not have any expected effects on the natural or pre-existing pattern of watercourses, groundwater and/or the watershed(s).	No mitigation measure is required for this indicator.
Principle 8.2 Erosion and/or Water Body Instability			

a. Could the Project directly or indirectly cause additional erosion and/or water body instability or disrupt the natural pattern of erosion? b. Is the Project's area of influence susceptible to excessive erosion and/or water body instability?	a.b. Potentially	a.b. The project may increase the risk of erosion due to scraping of topsoil.	a.b. Topsoil will be separated and used in landscaping[55].
Principle 9.1 Landscape Modification and Soil			
Does the Project involve the use of land and soil for production of crops or other products?	Yes	Project area is classified under "agricultural land" in Environmental Plan[56].	Required permissions will be obtained from governmental institutions. 1. Energy Market Regulatory Authority (Van Governorate, Provincial Directorate of Food, Agriculture and Livestock) – Authorization for Expropriation (09/03/2017) 2. Energy Market Regulatory Authority (to Department of Finance) – Authorization for Expropriation (20/06/2017)

[55] Arısu SPP, page 82
[56] Arısu SPP, page 41

			3.Van Governorate – Pastureland Allocation Permission (26/02/2018) 4.Van Provincial Directorate for Environment and Urbanization - Prior Authorization (01/03/2019)
Principle 9.2 Vulnerability to Natural Disaster			
Will the Project be susceptible to or lead to increased vulnerability to wind, earthquakes, subsidence, landslides, erosion, flooding, drought, or other extreme climatic conditions?	Possible	Tuşba district and the project site are in the 2nd Degree Seismic Zone according to the earthquake zones determined by the General Directorate of Disaster Affairs[57].	All the design and construction works will be performed in accordance with relevant regulation (Regulation on Buildings Constructed in Earthquake Zones.) [58].
Principle 9.3 Genetic Resources			
Could the Project be negatively impacted by or involve genetically modified organisms or GMOs (e.g., contamination, collection and/or harvesting, commercial development, or take place in facilities or farms that include	No	The project activity is not relevant to the use of genetically modified organisms or GMOs since it is a renewable energy power plant.	No mitigation measure is required for this indicator.

[57] Arısu SPP, page 31
[58] Arısu SPP, page 32

GMOs in their processes and production)?			
Principle 9.4 Release of pollutants			
Could the Project potentially result in the release of pollutants to the environment?	Yes	Solis waste, waste oil and domestic wastewater generation are expected during both construction and operation.	Domestic solid wastes will be collected and handled according to the Solid Waste Control Regulation. Recyclables will be collected separately and send to the recycling facility, periodically. Domestic wastewater generated will be collected in a cesspool and then conveyed to the closest wastewater treatment system. Waste oil will be collected and disposed according to the Regulation on Waste Oil Control [59].
Principle 9.5 Hazardous and Non-hazardous Waste			

[59] Arısu SPP EIA, page 91-92-97

Will the Project involve the manufacture, trade, release, and/ or use of hazardous and non-hazardous chemicals and/or materials?	Yes	Project is expected to create solid, and liquid wastes during its construction.	Handling, storage, and disposal of these wastes will be done according to the Turkish regulations.
Principle 9.6 Pesticides & Fertilisers			
Will the Project involve the application of pesticides and/or fertilisers?	No	The project is not relevant since it is a renewable energy project.	No mitigation is needed for this indicator.
Principle 9.7 Harvesting of Forests			
Will the Project involve the harvesting of forests?	No	The closest forestry area is 35 km distant from the project area[60].	No mitigation is needed for this indicator.
Principle 9.8 Food			
Does the Project modify the quantity or nutritional quality of food available such as through crop regime alteration or export or economic incentives?	No	The project is not relevant since it is a renewable energy project.	No mitigation is needed for this indicator
Principle 9.9 Animal husbandry			

[60] Arısu SPP EIA, page 42

Will the Project involve animal husbandry?	No	It is irrelevant to the Project. As a renewable energy power plant, the Project does not involve any animal husbandry.	No mitigation measure is required for this indicator.
Principle 9.10 High Conservation Value Areas and Critical Habitats			
Does the Project physically affect or alter largely intact or High Conservation Value (HCV) ecosystems, critical habitats, landscapes, key biodiversity areas or sites identified?	No	There are no national parks, natural parks, natural protection areas, wildlife protection areas as declared in accordance with the Turkish national legislation.	No mitigation is needed for this indicator.
Principle 9.11 Endangered Species			
a. Are there any endangered species identified as potentially being present within the Project boundary (including those that may route through the area)? b. Does the Project potentially impact other areas where endangered species may be present through transboundary affects?	a. No b. No	a. No endemic, endangered and or threatened flora and fauna species were identified in the project site and its vicinity[61]. b. No endemic, endangered and or threatened flora and fauna	a. No mitigation is needed for this indicator. b. No mitigation is needed for this indicator.

[61] Arısu SPP EIA, page 49

		species were identified in the project site and its vicinity[62].	

[62] Arısu SPP EIA, page 49

APPENDIX 2- CONTACT INFORMATION OF PROJECT PARTICIPANTS

Organization name	Gün Güneş Enerjisi Elektrik Üretim Sanayi ve Ticaret A.Ş
Registration number with relevant authority	-
Street/P.O. Box	İkitelli Organize Sanayi Bölgesi Ziya Gökalp Mah. Atatürk Bulvarı 8. Cadde No:3 Başakşehir
Building	-
City	İstanbul
State/Region	-
Postcode	-
Country	Turkey
Telephone	+90 212 267 4206
E-mail	-
Website	http://www.boydakenerji.com.tr/
Contact person	
Title	Project manager
Salutation	Mr.
Last name	Beyla
Middle name	-
First name	Alpay
Department	Management
Mobile	-
Direct tel.	+90 212 267 4206
Personal e-mail	alpay.beyla@boydakenerji.com

Organization name	GTE
Registration number with relevant authority	
Street/P.O. Box	Mustafa Kemal Mah 12118. Cad. No:4
Building	C/42
City	Ankara
State/Region	Çankaya
Postcode	06510
Country	Turkey
Telephone	+90 312 514 63 63
E-mail	kemal.demirkol@gte.com.tr
Website	www.gte.com
Contact person	Mehmet Kemal Demirkol
Title	Director
Salutation	Mr.
Last name	Demirkol
Middle name	Kemal
First name	Mehmet
Department	Management
Mobile	+90 530 661 40 88
Direct tel.	+90 312 514 63 63
Personal e-mail	kemal.demirkol@gte.com.tr

APPENDIX 3- LUF ADDITIONAL INFORMATION

Risk of change to the Project Area during Project Certification Period:	
Risk of change to the Project activities during Project Certification Period:	
Land-use history and current status of Project Area:	
Socio-Economic history:	
Forest management applied (past and future)	
Forest characteristics (including main tree species planted)	
Main social impacts (risks and benefits)	
Main environmental impacts (risks and benefits)	
Financial structure	
Infrastructure (roads/houses etc):	
Water bodies:	
Sites with special significance for indigenous people and local communities - resulting from the Stakeholder Consultation:	
Where indigenous people and local communities are situated:	
Where indigenous people and local communities have legal rights, customary rights or sites with special cultural, ecological, economic, religious or spiritual significance:	

APPENDIX 4-SUMMARY OF APPROVED DESIGN CHANGES

Please refer to Design Change Requirements for more information on procedures governing Design Changes

Revision History

Version	Date	Remarks
1.2	14 October 2020	Hyperlinked section summary to enable quick access to key sections Improved clarity on Key Project Information Inclusion criteria table added Gender sensitive requirements added Prior consideration (1 yr rule) and Ongoing Financial Need added Safeguard Principles Assessment as annex and a new section to include applicable safeguards for clarity Improved Clarity on SDG contribution/SDG Impact term used throughout Clarity on Stakeholder Consultation information required Provision of an accompanying Guide to help the user understand detailed rules and requirements
1.1	24 August 2017	Updated to include section A.8 on 'gender sensitive' requirements
1.0	10 July 2017	Initial adoption