

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

0 – Description of project

0 – Application of approved Gold Standard Methodology (ies) and/or demonstration of SDG Contributions

0 – Duration and crediting period

0 – Summary of Safeguarding Principles and Gender Sensitive Assessment

0 – Outcome of Stakeholder Consultations

Appendix 1 – Safeguarding Principles Assessment (mandatory)

0 – Contact information of Project participants (mandatory)

0 – Summary of Approved Design Changes (project specific)

KEY PROJECT INFORMATION

GS ID of Project	GS1173
Title of Project	Çamlıca II HEPP
Time of First Submission Date	29/12/2021
Date of Design Certification	11/04/2022
Version number of the PDD	15
Completion date of version	04/01/2023
Project Developer	GTE KARBON SÜRDÜRÜLEBİLİR ENERJİ EĞİTİM DANIŞMANLIK VE TİC. AŞ (Project Developer)
Project Representative	HGG Enerji Üretim Anonim Şirketi (Project Owner)
Project Participants and any communities involved	1-HGG Enerji Üretim Anonim Şirketi (Project Owner) 2-GTE KARBON SÜRDÜRÜLEBİLİR ENERJİ EĞİTİM DANIŞMANLIK VE TİC. AŞ (Project Developer)
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	RE Activity Requirements (GS4GG)
Methodology (ies) applied and version number	ACM0002, version 20.0 "Consolidated baseline methodology for grid connected electricity generation from renewable sources"
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)	Renewable energy power plants such as CAMLICA II HEPP, will contribute to "Emissions Reductions or Removals and/or Adaptation to Climate Change" by reducing CO2 emissions caused by fossil fuel-fired power plants that are displaced due to the project activity, in line with GS4GG principles.	44,145 tonnes of CO2e per annum	GS VERs
7 Affordable and Clean Energy	Increasing the number and percentage of renewable energy power plants such as wind power plants will provide substantial increase in the share of renewable energy in the global energy mix and ensure universal access to affordable, reliable and modern energy services.	89,558 MWH/yr	MWh/yr
8 Decent Work and Economic Growth	The project will generate employment and income.	At least 11 people to be employed	Number of people employed by the project

SECTION A. DESCRIPTION OF PROJECT

A.1 Purpose and general description of project

Çamlıca II Hydro Electrical Power Plant (HEPP) which is a run-of-river type project built on river Zamantı was designed with a capacity of 17.88 MWm / 17.58 MWe. The main principle behind the project design is to make use of the elevation difference of 69 m which is approximately 1500 m away from the Çamlıca Village¹.

Prior to project implementation, there exists only one hydro power plant which is Çamlıca I HEPP, located upstream. Thus, the water utilization of the project does not affect Çamlıca I HEPP. The project utilizes tail water from Çamlıca I Regulator and HEPP. In the facility, the Zamantı river stream reaches from the water inlet structure to the surge tank by free flow passing through turbines at a power of 3x(5.96 MWm / 5.86 MWe) and converted to energy. Electricity generated within the project boundaries is transferred to the national grid via Çamlıca I HES OG switchyard.²

With the amended license (Licence no: EÜ/10214-13/04898) the output capacity of the plant is stated as 89.558 GWh/y and based on this figure, about 44,145 tCO₂e annual emission reduction is estimated. The total emission reduction for the second crediting period is estimated as 309,018 tonnes CO₂. The project owner name has been changed from Derin Enerji Üretim San. ve Tic. A.Ş to HGG Enerji Üretim Anonim Şirketi on 23/12/2020.³

Main purpose of the project is to produce clean, sustainable, and environment-friendly energy. Since the project activity involves generating electricity from renewable natural resources, the risks it bears are considerably low and the project is designed in the most efficient way possible while keeping the local sources and nature unharmed. All the necessary and legally mandatory documents are obtained, and environmental impact assessment proved that the project does not pose any threats for the nature.

¹ ÇAMLICA HEPP PIF, page 8

² Generation licence

³ 23 12 2020 DERİN BİRLEŞME KAPANIŞ

Additionally, the project is expected to provide an impetus for the economic activities in the nearby regions, while increasing the awareness about environmental issues. The project is also expected to directly contribute to local area by creating job opportunities. On the macro scale, project activities will result in expanding the share of renewables in the national energy pool and reduce the dependency on the imports which immediately translates into saving currency.

Table 1. Milestones for Camlica II HEPP

Milestone	Date
Water Right Utilization Agreement	03/01/2011
License Issuance	09/02/2011
EIA Exemption Letter	21/02/2011
Carbon Certification Proposal	08/06/2011
Project Consultancy Services Agreement	12/07/2011
Bank Loan Agreement	25/07/2011
Construction Agreement	08/08/2011
Carbon Certification Agreement	20/10/2011
LSC Meeting	26/01/2012
Equipment Agreement	23/02/2012
Start of Construction*	01/05/2012
State Hydraulic Works Project Approval	27/12/2012
Ecosystem Assessment Report	24/04/2013
Revised Exemption from EIA Certificate	20/05/2013
System Connection Agreement	07/08/2013
Energy Transmission Line Approval	02/09/2013
Commissioning Date	02/05/2014

*Project start date as per GS Toolkit and Requirements v2.1

A.1.1. Eligibility of the project under Gold Standard

General Eligibility Criteria:

- The project which is located in Turkey is eligible according to 3.1.1 GS4GG Principles and Requirements and Renewable Energy Activity Requirements since it is a large-scale hydro power plant supplying energy to the national grid.
- The project complies with host country's legal, environmental, ecological and social regulations.

- All contact details are provided in Appendix 1.
- Project does not use any ODA funding.
- Project has not applied or is seeking for any other voluntary or compliance standards programme in order to avoid double counting.

Renewable Energy Activity Requirements:

- 2.1 Principle-1: Contribution to Climate Security & Sustainable Development: Project contributes 7 SDSs including SDG 13. Please see Section B 6.1.
- 2.2 Principle-2: Safeguarding Principles: Please see Section D.
- 2.3 Principle-3: Stakeholder Inclusivity: Please see Section E.
- 2.4 Principle-4: Demonstration of Real Outcomes: Please see Section B 6.4.
- 2.5 Principle-5: Financial Additionality & Ongoing Financial Needs: Please see Section B.5.

Moreover, the project is also eligible for the additional criteria set for the hydro power projects:

- The project is not located on any land which is classified as High Conservation Value areas, both nationally and internationally.
- A Project Identification File has been prepared for Camlica II project by Gökoğuzlar Mühendislik on November 2009 considering final project design. In order to assess the Environmental Impacts of the project, including its location, its characteristics, capacity, interaction with other plants in the vicinity, utilization of natural resources, waste management, social and economic impacts, any natural and historical protected areas within the project boundaries, assessment of geological and seismic aspects of the project site has been considered.

This report has been evaluated by Province Directorate of Environment and Forestry. After evaluation of the project and comments of the local agencies, on 21/02/2011, Directorate has decided that no detailed EIA is required for the project activities.

Also, since the project is a run-of-river type hydroelectric power generation activity, effects of project on environment has been assessed according to the table C.2 of special guidance of Gold Standard Toolkit. Assessment has shown that project activity complies with GS guidance for run-of- river type HEPPs.

In addition to all existing local regulations, project owner has issued all additional precautions to minimize any adverse environmental impacts that may be caused by project activity as a company policy.

- Stakeholder meeting has been done as stated in Section E.
- A preliminary review was conducted.

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

All the legal rights of the project were given to Derin Enerji Üretim Sanayi A.Ş. for 44 years. The project owner was Derin Enerji Üretim San. ve Tic. A.Ş but the company name has been changed in the previous monitoring period as HGG Enerji Üretim A.Ş. The generation licence has also been revised with a number of license no EÜ/10214-13/04898 on 20/05/2021.

A.2 Location of project

Project site is located in Kayseri Province of Turkey. Nearest settlement to the project site is Çamlıca village within the boundaries of Yahyalı district. Project site located approximately 120 km away to the south of Kayseri city centrum.

Table 2. Coordinates

Structure	Latitude	Longitude
Tunnel Inlet-Outlet	37.9179036 - 37.9040153	35.4938434 - 35.4909861
Forebay	37.9045992 - 37.9045096	35.4910740 - 35.4910483



Figure 1. Çamlıca II HEPP project site

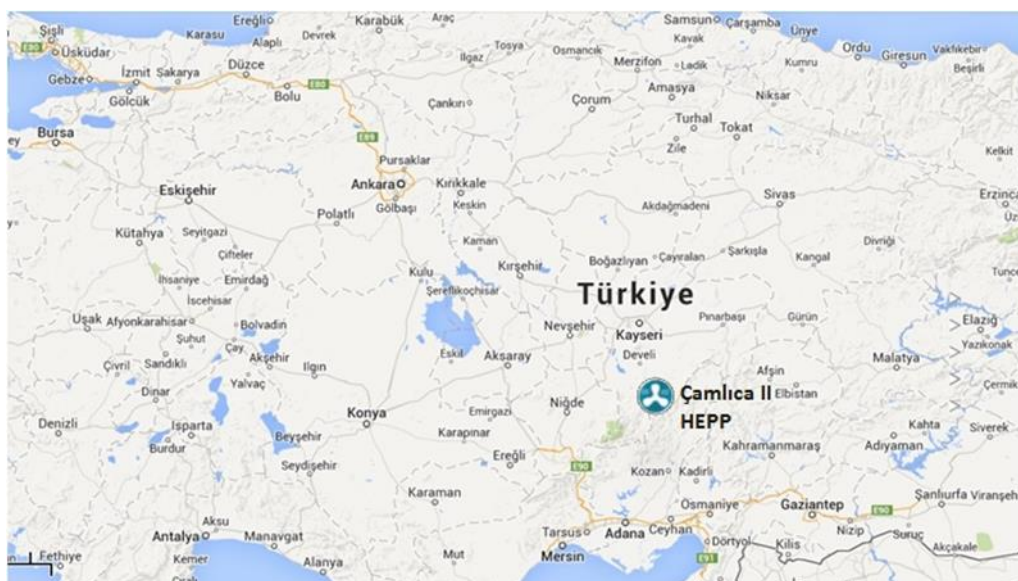


Figure 2. Çamlica II HEPP location

A.3 Technologies and/or measures

Released water from Çamlica II HEPP is kept in the river basin. Water released from Çamlica I HEPP is transferred to the energy transmission channel by 1500 m long and 50.00 m³/sec capacity water transfer channel. At the 1347.50 m, the channel is connected to the surge chamber and at the end of surge chamber water is transferred to penstock. The penstock continues until the generation area. 30 m³/sec flow will enter the plant and the tail water will be transferred back to the river Zamanti. Even though, according to the initial estimations, gross energy output figure corresponds to 90.7 GWh, the project design was later finalised so that the annual electricity generation could be 89.558 GWh.²

Specifications for the built tunnel are as follows:

Table 3. Tunnel specifications

Tunnel length	1500 m
Progress rate	1.25m/shift
Average drilling rate	6 cm/d
Time allocated for drilling	40% shift (168d)
Cartridge diameter	2.5 cm
Geological formation	Limestone
Air Conditioning	Ventilation
Average length of sewage pit	1.40 m

Cross-sectional area of the tunnel	7.5 m ²
Holes per unit drilling area	2.2/m ²
Total holes	13
Unit amount of explosives	1.125 kg/m ³
Ventilation duration	15 min
Explosives per hole	0.65 kg/hole

Specifications for the used turbines are as follows:

Table 4. Turbine specifications

Turbine Type	Francis
Total Installed Power	17.58 MWe
Total Number of Units	3 x (5.96 MWm/5.86MWe)
Gross Elevation	69 m
Maximum Net Elevation	66 m
Minimum Net Elevation	66 m

A.4 Scale of the project

It is a large-scale project having 17.58 MWe installed capacity providing 44,145 tonnes CO2 reduction.

A.5 Funding sources of project

Project is financed by the company's own resources. No public funding was used.

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

B.1. Reference of approved methodology (ies)

The UNFCCC approved simplified baseline and monitoring ACM0002, version 20.0. ACM0002 refers to the following tools:

- “Tool to calculate the emission factor for an electricity system”, Version 07.0
- Assessment of the validity of the original/current baseline and update of the baseline at the renewal of the crediting period, ver 03.0.1

B.2. Applicability of methodology (ies)

This methodology is applicable to grid-connected renewable power generation project activities that: (a) install a new power plant at a site where no renewable power plant was operated prior to the implementation of the project activity (greenfield plant); (b) involve a capacity addition; (c) involve a retrofit of (an) existing plant(s); or (d) involve a replacement of (an) existing plant(s).

The proposed project is a greenfield plant which will install a new power plant at a site where no renewable power plant was operated prior to the implementation of project activity.

The methodology is applicable as it satisfies the following conditions:

- The project activity is the installation of a hydro power plant/unit (with a run-of-river reservoir).
- The project does not involve capacity additions, retrofits or replacements.
- The project activity is implemented in an existing river bed, with no change in the volume of any of reservoirs.
- The power density calculated for the entire project activity is greater than 4 W/m²
- Project activities does not involve switching from fossil fuels to renewable energy sources at the site of the project activity.
- Project is not a biomass fired power plant.

Since the project is a hydro power plant one of the following conditions should be satisfied;

“The project activity is implemented in an existing single or multiple reservoirs, with no change in the volume of any of reservoirs; or

The project activity is implemented in an existing single or multiple reservoirs, where the volume of any of reservoirs is increased and the power density of each reservoir, as per the definitions given in the project emissions section, is greater than 4 W/m²; or

The project activity results in new single or multiple reservoirs and the power density of each reservoir, as per the definitions given in the project emissions section, is greater than 4 W/m².”

In case of Camlica-II HEPP, since the project is a run-of-river type hydro energy plant, it does not use multiple reservoirs, and satisfies the condition (a) where there is no change in the volume of any reservoirs.

B.3. Project boundary

Source		GHGs	Included?	Justification/Explanation
Baseline Scenario	Electricity Generation by the grid connected power plants	CO ₂	Yes	Major emission source
		CH ₄	No	Minor emission source. Excluded for simplification
		N ₂ O	No	Minor emission source. Excluded for simplification
Baseline scenario	Emissions of CH4 from the reservoir	CO ₂	No	Minor emission source. Excluded for simplification as per the applied methodology
	CO2 emissions from combustion of fossil fuels for electricity generation	CH ₄	Yes	Main emission source. Calculated for determining significance.
		N ₂ O	No	Minor emission source. Excluded for simplification

“The spatial extent of the project boundary includes the project power plant and all power plants connected physically to the electricity system that the CDM project power plant is connected to.” as per the applied methodology. In case of Camlica II HEPP, since all the power plants are connected to the national grid, the project boundary is defined as power plant components; three turbines, power house, weir, substation and the national grid.

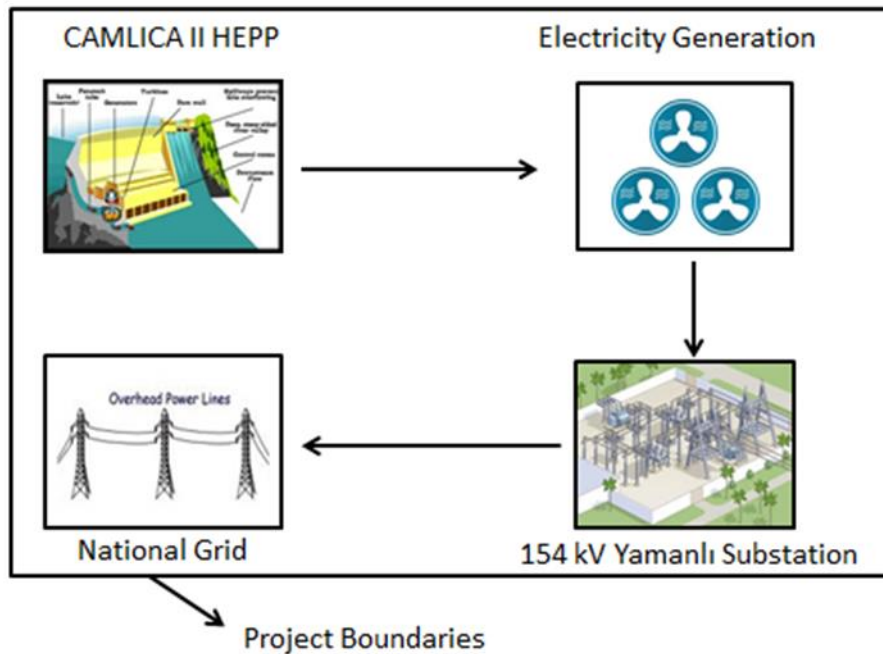


Figure 3. Project boundary

B.4. Establishment and description of baseline scenario

According to the methodology, ACM0002: Grid-connected electricity generation from renewable sources v20.0, 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”.

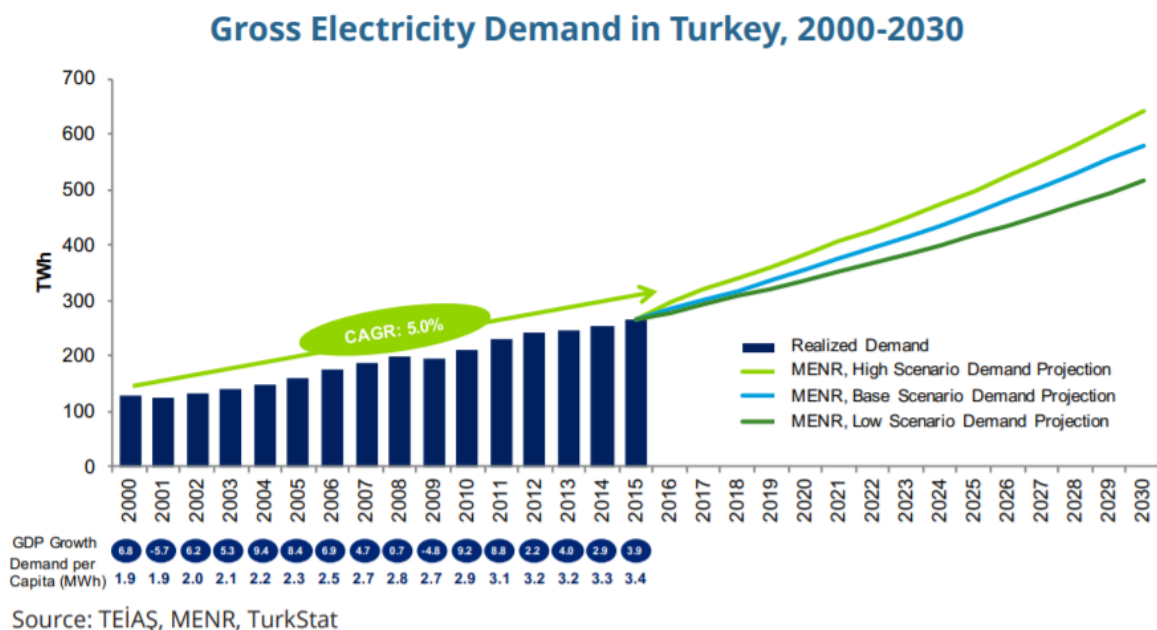


Figure 4. Projection of Turkey's electricity demand⁴

According to the Tool 11: Assessment of the validity of the original/current baseline and update of the baseline at the renewal of the crediting period, Version 3.0.1, there are some requirements:

- The tool offers 2 steps. The first step provides an approach to evaluate whether the current baseline is still valid for the next crediting period. The second step provides an approach to update the baseline in case that the current baseline is not valid anymore for the next crediting period.
- Although there is no change in national/sectoral policies affecting project implementation (Step 1.1), investment and technology (Step 1.3), the current situations such as margin calculations (Step 1.2) and parameters not monitored (Step 1.4) have been changed. Therefore, Step 2 has been applied.

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".

⁴ <https://www.dunyaenerji.org.tr/wp-content/uploads/2017/10/turkish-energy-market-outlook.pdf>

Turkish electricity generation is mainly composed of thermal power plants and the share of renewable resources. Since Turkey is an advanced developing country, there is an increasing demand for electricity which is fully expected to continue in the foreseeable future.

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. The statistics from TEIAS webpage show that the installed capacity that utilize lignite in Turkey has always showed an increasing trend, based on the available information covering the years from 1940 to 2019^{5,6,7}

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.

⁵ <https://webapi.teias.gov.tr/file/18800125-dc32-4c4e-8a3e-c771863e5a49?download>

⁶ <https://webapi.teias.gov.tr/file/07f76c00-d256-4ccb-b25e-9478c9dedc04?download>

⁷ <https://webapi.teias.gov.tr/file/163dfadf-80d8-4271-baf8-bc0b76710177?download>

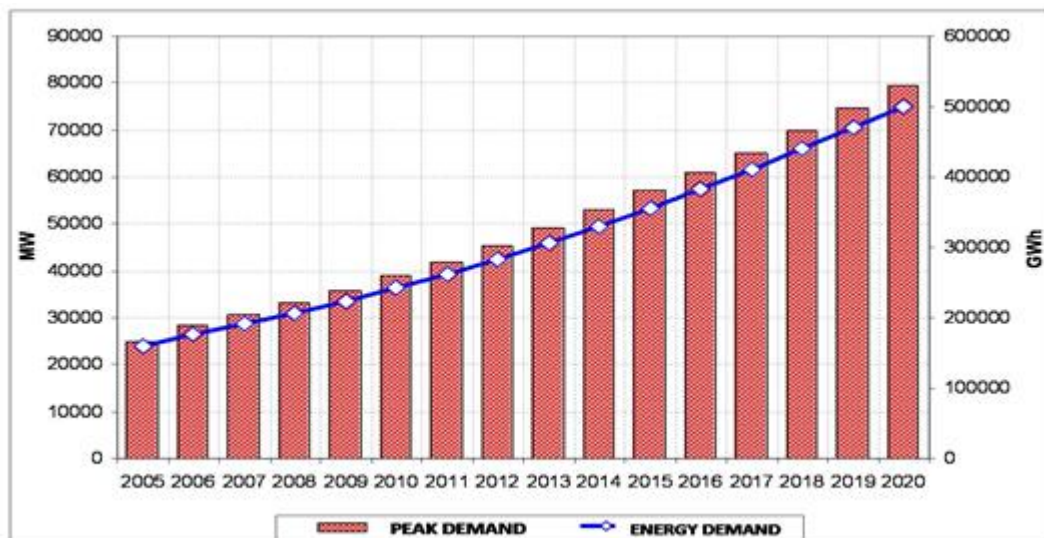


Figure 5. Peak Load and consumption projection for Turkish electricity system between 2005-2020⁸

According to the Ministry of Energy and Natural Resources statistics⁹, share of WPPs together with geothermal power plants could hardly reach 6.6% in 2019 whereas share of Coal and natural gas are 37.3% and 29.8%, respectively. 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.

⁸ Graph 2, https://www.emo.org.tr/ekler/6e51f22c86d237a_ek.doc?tipi=41&turu=X&sube=0

⁹ <https://enerji.gov.tr/bilgi-merkezi-enerji-elektrik>

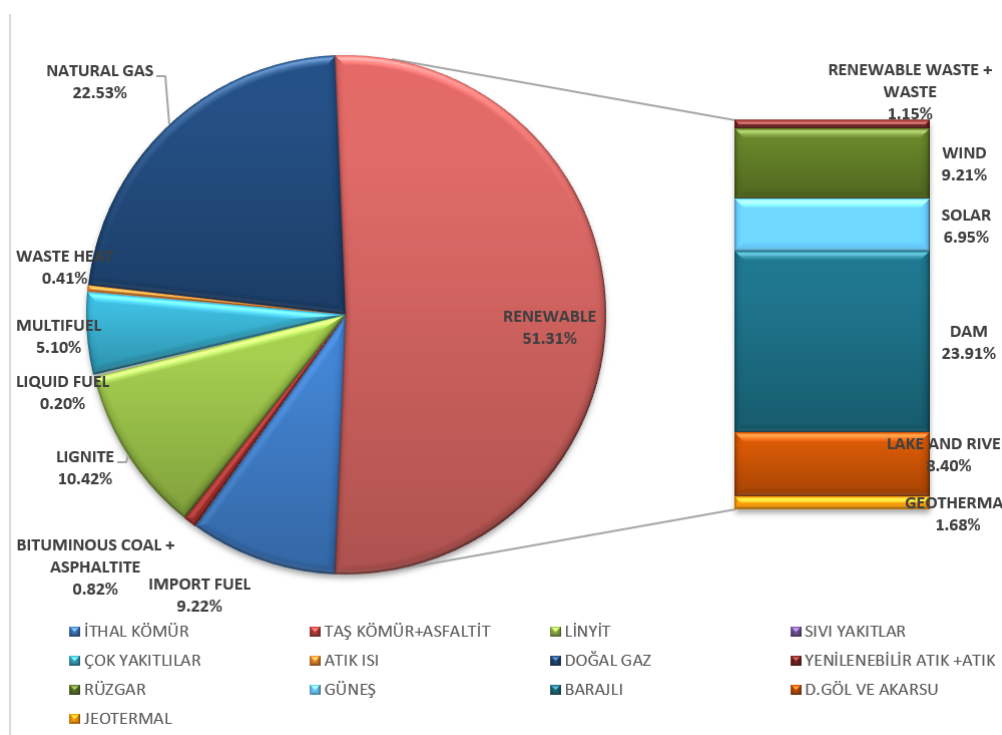


Figure 6. Distribution of installed capacity by primary energy resources¹⁰

B.5. Demonstration of additionality

Additionality has been demonstrated in the first crediting period. There is no change in project implementation, therefore there is no need to conduct an additionality assessment in the second crediting period.

Additionality that was demonstrated during the design certification is provided below. The weblinks in this section might not be available since they were available at the time of design certification, which was in 2014.

According to the applied methodology (ACM0002) 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. Within this framework, the project is expected to generate about 89.558 GWh of electricity as per the early estimations and reduce about 49,436 tCO₂ emissions through replacing the electricity that would need to be supplied via the national grid in the

¹⁰ <https://webapi.teias.gov.tr/file/39abb292-4b3e-4e70-9e08-914d0ba9bd43?download>

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.

Step 1 - Identification of Alternatives to the project activity consistent with current laws and regulations

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

Since the baseline scenario is prescribed by the approved methodology alternative project activity scenarios are not discussed as per CDM VVS paragraphs 113 and 115.

Outcome of Step 1a

According to the methodology, baseline scenario has been 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”, which is the most plausible alternative to the project activity.

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

The following applicable mandatory laws and regulations have been identified:

1. Electricity Market Law¹¹
2. Law on Utilization of Renewable Energy Resources for the Purpose of Generating Electricity Energy¹²
3. Energy Efficiency Law¹³
4. Forest Law¹⁴
5. Environment Law¹⁵

¹¹ Law number 6446, enactment date 14/03/2013

<https://www.mevzuat.gov.tr/mevzuat?MevzuatNo=6446&MevzuatTur=1&MevzuatTertip=5>

¹² Law number 5346, enactment date 18/05/2005 <http://www.epdk.gov.tr/documents/10157/4b360128-53aa-4174-8104-a6c10434ac9c>

¹³ Law number 5627, enactment date 02/05/2007

http://www.eie.gov.tr/english/announcements/EV_kanunu/EnVer_kanunu_tercume_revize2707.doc

¹⁴ Law number 6831, enactment date 31/08/1956

¹⁵ Law number 2872. Published in official gazette No. 18132 on 11/08/’83

The resultant alternative to the project as outlined in Step (1a) is in compliance with the applicable laws and regulations.

Outcome of Step 1b

Mandatory legislation and regulations for alternative scenario is 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 in line with the "Guidelines on the assessment of investment analysis v.05"¹⁶ and "Tool for the demonstration and assessment of additionality v.07.0.0".¹⁷ The aim of the analysis is to make an economic and financial evaluation of the project. No public funding or ODA are available in Turkey for finance of this type of projects. A preliminary loan agreement has been signed for the project activity. Final loan agreement is expected to be signed after negotiations are finalized. For investment analysis, loan conditions have been determined considering the average market rates. Initial design capacity (15.4MWe) was used for the investment analysis as the investment decision was taken considering the initial conditions.

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

¹⁶ http://cdm.unfccc.int/Reference/Guidclarif/reg/reg_guid03.pdf

¹⁷ <http://cdm.unfccc.int/methodologies/PAmethodologies/tools/am-tool-01-v7.0.0.pdf>

For benchmark analysis, figure defined by World Bank for similar project types have been used which has been given as 15%¹⁸ by a report generated in May 2009. For the proposed project, in order to reach this equity IRR values, average electricity tariff must be above 7.7 \$c/kWh in the absence of carbon revenue and assuming that initial investment figures are realized so that the investment will become reasonable.

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

Table 2. Main financial parameters used for investment analysis

Parameters	Unit	Data Value
Installed Capacity	(MWm)MWe	(15.85)15.40 ¹⁹
Annual Grid Connected Output	GWh	90.70 ²⁰
Capital Investment	Million \$	31.39 ²¹
Income tax rate	%	20 ²²
Expected tariff	\$ Cents/kWh	7.3 ²³
Expected VERs price	\$/ tons CO2e	6.5 ²⁴
Operation&Maintenance Cost	\$/Year	3,337,000 ²⁵

Equity IRR has been selected as financial indicator as per the available information. Since the aim of the analysis is not to determine the viability of the project to service debt, project IRR indicator has not been selected. Equity IRR has been applied to demonstrate the return of investment without taking into account the loans and interest rate associated with it. Equity IRR has been calculated according to the tool as stated in the applied methodology. Electricity tariff has been used as \$7.3 Cent/kWh. Annual generation has been taken as 90.70 GWh and maintenance cost has been estimated as \$3,337,000. Investment decision date has been identified as the date of bank loan agreement. For depreciation calculations, expected life of construction and electromechanical equipment are determined as 40 years²⁶ and 25 years, respectively.²⁷ Calculation and estimations have been made conservatively therefore equity IRR value represents the most optimistic scenario in terms of capital investment and electricity generation. On the other hand electricity tariff is expected to increase so that the investment becomes attractive however as given below, expectations have not been realized yet due to the market conditions.

¹⁸ Project Appraisal Document for a proposed IBRD Loan (page 81)

¹⁹ Original Generation License

²⁰ Original Generation License

²¹ Investment Model submitted to DOE (during design certification)

²² <http://www.mmb.org.tr/default.aspx?pid=24826&nid=16297>

²³ <http://www.epdk.gov.tr/documents/10157/4b360128-53aa-4174-8104-a6c10434ac9c>

²⁴ Tulletprebon newsletter

²⁵ Financial Model

²⁶ <http://www.gib.gov.tr/fileadmin/mevzuat/ekski/verusulteb333ek.html>

²⁷ <http://cdm.unfccc.int/methodologies/PAmethodologies/tools/am-tool-10-v1.pdf>

Expected return on investment for these types of projects should be above 15% as per WB document however, expectation of many investors is returns around 25% for successful investments for some investment funds. Even if we consider the minimum benchmark equity IRR which is 15%, for proposed project, in order to reach this equity IRR values, average electricity tariff must be above 7.7 \$c/kWh in the absence of carbon revenue and assuming that initial investment figures are realized so that the investment will become reasonable.

For proposed project, equity IRR has been calculated as 12.66% in the absence of carbon revenue for the acquired licensed generation period. When we include the carbon revenue in the cash flow, equity IRR increases to 14.66% and the project becomes more attractive and viable for the investors as coupled with the view that energy sale prices that can be achieved from the project will likely increase in future years. Expectation that the electricity prices will increase is the risk for investors whereas realization of this expectation will be the premium. Carbon revenue has a significant effect in this respect in terms of decreasing the period for return on investment and risk of investment decision.

Following figure is given in order to reflect the actual electricity prices realized obtained from monthly reports of Market Settling and Balancing Center²⁸ between 01/12/2009-01/01/2012. It should be considered that these prices are highest prices obtained and power plants which sell electricity through bilateral agreements have lower income. Figure shows that the actual prices have even been lower than guaranteed price in some cases therefore assumption of 7.3 \$cents per kWh (or 73 \$/MWh) is a realistic scenario as demonstrated below.

²⁸ <http://pmum.teias.gov.tr/UzlasmaWeb/>

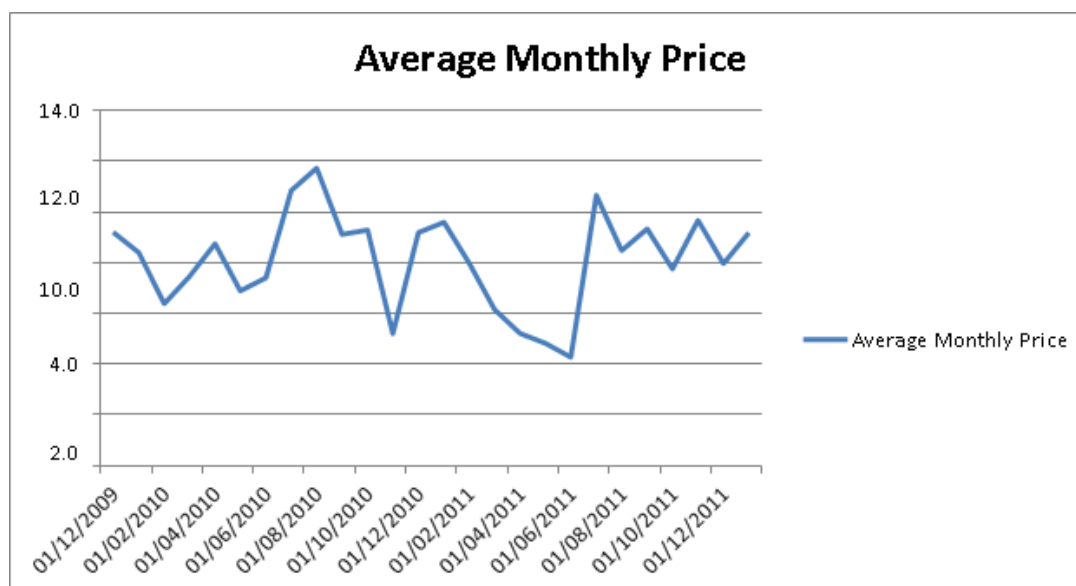


Figure 7. Highest tariffs observed between 01/12/2009-31/01/2012 (\$ cents/kWh)²⁹

This equity IRR value represents the most optimistic scenario in terms of capital investment and electricity generation whereas electricity tariff is expected to increase due to increasing electricity demand so that the investment becomes attractive.

For the proposed project, in order to reach the benchmark equity IRR values, average electricity tariff must be above 7.7\$ c/kWh so that the investment will become reasonable. Considering that control of hydro power plants during generation period is limited, expectation that the floor electricity prices will increase is the risk for investors whereas realization of this expectation will increase the premium. Carbon revenue has a significant affect in this respect in terms of decreasing the period for return on investment and minimizing investment risk.

Sub-step 2d - Sensitivity Analysis

Sensitivity analysis has been carried out for three main parameters identified which constitute all income and expenses of project effecting project return;

- Investment Cost
- Operating Cost
- Electricity Sales revenue

For a range of $\pm 15\%$ fluctuations in investment (construction and EM equipment) cost, operating cost and

²⁹ <http://dgpys.teias.gov.tr/dgpys>

±15% fluctuation in electricity income, table below has been obtained. Parameters have been selected as per the Guidelines on Investment analysis which are defined as investment cost, operation cost, changes in tariff and electricity production.

Table 3. Sensitivity analysis for proposed project without carbon revenue

Fluctuation %	-15	-10	-5	0	5	10	15
Investment Cost	16.34	14.91	13.70	12.66	11.75	10.95	10.24
Operation Cost	15.80	14.71	13.66	12.66	11.69	10.76	9.86
Tariff	7.33	9.01	10.77	12.66	14.69	16.91	19.35
Electricity Production	9.27	10.35	11.48	12.66	13.89	15.19	16.56

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.

According to local regulations, electricity price is determined daily according to Market Financial Settlement Center (MFSC) 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, Wind 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 MFSC figures, electricity tariff fluctuated between 4.3 \$/kWh and 10.2 \$/kWh between 01/12/2009 and 31/01/2012 whereas the weighted average of the tariff has been calculated as 8.1\$/kWh in this period³⁰. Since this value shows the spot price at the time of selected investment decision date, it 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 water resources is high 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.

³⁰ <https://pmum.teias.gov.tr/UzlasmaWeb/>

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.

Step 3. Barrier analysis

This step is not applied as the additionality is demonstrated in previous steps.

Step 4. Common Practice Analysis

According to the "Tool for demonstration and assessment 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.

Annex-8 , Guidelines on Common Practice version 02.0 has been followed.³¹

Sub-Step 4.1: Calculate applicable output range as +/-50% of the design output or capacity of the proposed project activity.

The design capacity of the proposed project is 15.4 MWe at time of investment decision. Therefore, the applicable output range is from 7.7 MW to 23.1 MW

Sub-Step 4.2: In the applicable geographical area, identify all plants that deliver the same output or capacity, within the applicable output range calculated in Step 1, as the proposed project activity and have started commercial operation before the start date of the project. Note their number Nall. Registered CDM project activities and projects activities undergoing validation shall not be included in this step:

All power plants that have same capacity, within the range 7.7 MW to 23.1 MW³² has been listed in common practice excel sheet. Properties of the power plants are also indicated in this excel sheet. After excluding the VER projects, there exist 46 power plants being operated in Turkey. These power plants have been operational before the start date of the proposed project.

³¹ http://cdm.unfccc.int/Reference/Guidclarif/meth/meth_guid44.pdf

³² <http://www.teias.gov.tr/KAPASITEPROJEKSIYONU2012.pdf>

Therefore; $N_{all}=46$

Sub-Step 4.3: Within plants identified in Step 3, identify those that apply technologies different than the technology applied in the proposed project activity. Note their number N_{diff} .

It has been determined that, all hydro power plants except ERENKOY HPP, SUMER HPP, YUKARI MANAHOZ HPP, KULP I HPP, SARMAŞIK I HPP, SARMAŞIK II HPP and YAVUZ HPP applied

different technologies in terms of investment models compared to the proposed project and these three power plants were excluded from the list in order to follow a conservative approach since there was no available information regarding their applied technologies. Among the companies taken into consideration, for example in BOT (build-operate-transfer) type of projects, project owner receives a concession from public to finance, construct, operate, and they have a different financial model. List of the power plants is tabulated below:

Table 4. List of power plants

No	Hydroenergy Plant	Installed Capacity	Licence Type	Project Status
1	BERDAN	10.2	EUAS	Different Investment Model
2	KISIK	9.3	EUAS	Different Investment Model
3	ÇAĞ-ÇAĞ(NAS EN.)	14.4	Transfer of Operational Rights	Different Investment Model
4	KOVADA-I (BATIÇİM EN.)	8.3	Transfer of Operational Rights	Different Investment Model
5	AKSU (ÇAYKÖY)	16,0	BOT	Different Investment Model
6	FETHİYE	16.5	BOT	Different Investment Model
7	GAZİLER (İğdır)	11.2	BOT	Different Investment Model
8	GİRLEVİK-II / MERCAN	11.0	BOT	Different Investment Model
9	GÖNEN	10.6	BOT	Different Investment Model
10	TOHMA MEDİK (ALARKO)	12.5	BOT	Different Investment Model
11	BAYBURT HES	14.6	Generation Company	Different Scale
12	BALKONDU I HES (BTA	9.2	Generation Company	Different Scale
13	ELEK.)	9.5	Generation Company	Different Scale
14	BEREKET (FESLEK)	11.6	Generation Company	Different Scale
15	BEREKET (GÖKYAR)	8.5	Generation Company	Different Scale

16	ÇAMLIKAYA	9.3	Generation Company	Different Scale
17	ÇANAKÇI HES (CAN EN.)	8.2	Generation Company	Different Scale
18	ÇEŞMEBAŞI (GİMAK)	14.0	Generation Company	Different Scale
19	ENERJİ-SA-AKSU-	15.4	Generation Company	Built as BOT. Different Investment Model
20	ŞAHMALLAR	21.5	Generation Company	No Info Available
21	ENERJİ SA-SUGÖZÜ-	8.5	Generation Company	Different Scale
22	KIZILDÜZ	21.6	Generation Company	No Info Available
23	ERENKÖY	10.0	Generation Company	Different Scale
24	REG.(TÜRKERLER)	8.7	Generation Company	Different Scale
25	ERVA KABACA HES	22.4	Generation Company	No Info Available
26	FIRTINA ELEK.(SÜMER HES)	7.7	Generation Company	Different Scale
27	GÖK HES	14.2	Generation Company	Different Scale
28	H.G.M.ENER.(KEKLİCEK HES)	9.3	Generation Company	Different Scale
29	KAYEN ALFA EN.KALETEPE	10.2	Generation Company	Different Scale
30	HES (tortum)	15.0	Generation Company	Different Scale
31	KAZANKAYA REG.İNCESU HES(AKSA)	22.9	Generation Company	No Info Available
32	KULP I HES (YILDIZLAR EN.)	12.3	Generation Company	Different Scale
33	KULP IV HES (YILDIZLAR EN.)	12.5	Generation Company	Different Scale
34	ÖZGÜR ELEKTR.K.Maraş	21.0	Generation Company	No Info Available
35	Tahta HES	21.6	Generation Company	No Info Available
36	SARMAŞIK I HES (FETAŞ FETHİYE ENERJİ)	8.1	Generation Company	Different Scale
37	SARMAŞIK II HES (FETAŞ FETHİYE ENERJİ)	11.4	Generation Company	Different Scale
38	FETHİYE ENERJİ)	21.9	Generation Company	Built by EIE, Different Investment Model
39	SARIKAVAK (ESER)	13.3	Generation Company	Different Scale
40	ÜZÜMLÜ HES (AKGÜN EN.)	22.5	Generation Company	No Info Available
41	BEYKÖY ZORLU	16.8	Generation Company	Built By DSI. Privatized in 2008
42	KUZGUN ZORLU	20.9	Generation Company	Built By DSI. Privatized in 2009
43	TERCAN ZORLU	15.0	Generation Company	Built By DSI. Privatized in 2010

44	ÇILDIR ZORLU	15.4	Generation Company	Built By DSI. Privatized in 2011
45	İKİZDERE ZORLU	18.6	Generation Company	Built By DSI. Privatized in 2012
46	MERCAN ZORLU	20.4	Generation Company	Built By DSI. Privatized in 2013

Therefore;

$$N_{diff}=39$$

Sub-Step 4.4: Calculate factor $F=1-N_{diff}/N_{all}$ representing the share of plants using technology similar to the technology used in the proposed project activity in all plants that deliver the same output or capacity as the proposed project activity

$$F=1-N_{diff}/N_{all}=1-(39/46) = 0.152 (< 0.2)$$

According to the "Tool for the Demonstration and Assessment of Additionality" (version 06.0.0), if the factor F is greater than 0.2 and $N_{all}-N_{diff}$ is greater than 3, then the proposed project is a "common practice".

For the proposed project, $F=0.152$, therefore, the proposed project is not a common practice within the region. Hence, the proposed project is additional.

Given the fact that there aren't many known plants similar to the proposed project and built without carbon revenue, the proposed type of project should not be considered as a common practice in Turkey.

In order to assess the additionality of the project with the revised capacity (17.58 MWe), common practice analysis was repeated using the applicable range of 8.8MWe-26.4MWe and F factor found to be

0.167. Complete list of plants and associated calculations were submitted to the DOE to prevent contradictions. The project activity is not a common practice in any case.

B.5.1 Prior Consideration

Project is a regular project. There is also no design change occurred.

B.5.2 Ongoing Financial Need

Expected annual generation as per the generation license is 89,558 MWh. In terms of contribution of carbon revenues, around 120K GS-VER has been issued by July 2020³³.

³³ <https://registry.goldstandard.org/projects/details/108>

Until recent few years, carbon revenues have compensated most of the staff cost of project and have generated increase in the profit of the project. Considering that project will complete ten year feed-in-tariff period soon, income will be lower due to lower market sales price of electricity and increasing maintenance costs. Hence, significance of carbon revenues will be higher in next years.

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)
7 Affordable and Clean Energy	7.2	"By 2030, increase substantially the share of renewable energy in the global energy mix."
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"
13 Climate Action	13.3	"Improve education, awareness-raising and human and institutional capacity on climate change mitigation, adaptation, impact reduction and early warning"

B.6.1 Explanation of methodological choices/approaches for estimating the 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 (tCO₂)

BE_y = Baseline emissions in year y (tCO₂)

PE_y = Project Emissions in year y (tCO₂)

LE_y = Leakage emissions in year y (tCO₂)

Baseline emissions

Baseline emission is calculated according to the formula:

$$BE_y = EGP_{J,y} \times EF_{grid,CM,y}$$

Where:

EGP_{J,y} = Quantity of net electricity generation that is produced and fed into the grid as a result of the implementation of the CDM project activity in year y (data is gathered from energy yield assessment report of the project which is 89,558 MWh)

Emission Factor

EF_{grid,CM,y} = Combined margin CO₂ emission factor for grid connected power generation in year y calculated using the latest version of TOOL07: Tool to calculate the emission factor for an electricity system (tCO₂/MWh) (Nationally accepted emission factors have been used.³⁴)

Considering this is the second crediting period and the project is a hydro project, combined margin is calculated as follows:

$$CM = (BM \times 0.75) + (OM \times 0.25)$$

As given by the Ministry of Energy and Natural Resources, built margin is 0.4153 and operating margin is 0.7258⁸.

$$(0.4153 \times 0.75) + (0.7258 \times 0.25) = 0.4929 \text{ tCO}_2/\text{MWh}$$

$$BE_y = 89,558 \text{ MWh} \times 0.4929 \text{ tCO}_2\text{e}/\text{MWh} = 44,145 \text{ tCO}_2\text{e}$$

Project emissions

For hydro power project activities that result in new single or multiple reservoirs and hydro power project activities that result in the increase of single or multiple existing reservoirs, project emissions calculations involve CH₄ and CO₂ emissions from the reservoirs, (PE_{HP,y}) and estimated as follows:

³⁴ Document in .pdf is also provided:

<https://enerji.gov.tr//Media/Dizin/EVCED/tr/%C3%87evreVe%C4%B0klm/%C4%B0klmDe%C4%9Fi%C5%9Fikli%C4%9Fi/T%C3%BCrkiyeUlusalElektrik%C5%9EebekesiEmisyonFakt%C3%B6r%C3%BC/Belgeler/EK-2.pdf>

If the power density (PD) of the project activities is greater than 10 W/m² ; Project Emissions PE_{HP,y} = 0

Power density is calculated as follows:

$$PD = \frac{Cap_{PJ} - Cap_{BL}}{A_{PJ} - A_{BL}}$$

Where:

- PD = Power density of the project activity (W/m²)
- Cap_{PJ} = Installed capacity of the hydro power plant after the implementation of the project activity (W)
- Cap_{BL} = Installed capacity of the hydro power plant before the implementation of the project activity (W). For new hydro power plants, this value is zero
- A_{PJ} = Area of the single or multiple reservoirs measured in the surface of the water, after the implementation of the project activity, when the reservoir is full (m²)
- A_{BL} = Area of the single or multiple reservoirs measured in the surface of the water, before the implementation of the project activity, when the reservoir is full (m²). For new reservoirs, this value is zero

Although about half of the reservoir area is already river bed, A_{BL} has been assumed as zero. A_{PJ} had been estimated as 6,776 m² in the as per the reservoir map.

For proposed project HEPP,

- Cap_{PJ} = 17,580,000 We
- Cap_{BL} = 0.0 W
- A_{PJ} = 6,776 (m²)
- A_{BL} = 0.0 (m²)

Therefore, PD is calculated as;

$$PD = \frac{17580000 - 0}{6776 - 0}$$

$$PD = \sim 2594 \text{ W/m}^2$$

Since 2594 W/m² is far greater than 10 W/m², project emissions are considered 0.

Leakage

No leakage emissions are considered. The main emissions potentially giving rise to leakage in the context of electric sector projects are emissions arising due to activities such as power plant construction and upstream emissions from fossil fuel use (e.g. extraction, processing, transport). These emissions sources are neglected. Also, the energy generating equipment is not transferred from or to another activity. Therefore, leakage is considered as "0".

So, final emission reduction value is 44,145 **tCO₂**/year, and 309,018**tCO₂** for the whole crediting period of 7 years.

B.6.2 Data and parameters fixed ex ante

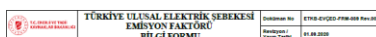
SDG13

Data/parameter	EF _{CM, y}
Unit	tCO ₂ /MWh
Description	Combined margin CO ₂ emission factor for the project electricity system in year y
Source of data	Ministry of Energy and Natural Resources, OM & BM values ³⁵

³⁵

Document in .pdf is also provided:

<https://enerji.gov.tr//Media/Dizin/EVCED/tr/%C3%87evreVe%C4%B0klm/%C4%B0klmDe%C4%9Fi%C5%9Fikli%C4%9Fi/T%C3%BCrkiyeUlusalElektrik%C5%9EebekesiEmisyonFakt%C3%B6r%C3%BC/Belgeler/EK-2.pdf>

	 TÜRKİYE ULUSAL ELEKTRİK ŞEBEKESİ EMİSYON FAKTÖRÜ BELGE FORMU Emisyon No: EYEM-01/2021-1708-000 Proje No: 01.08.2020 <table><tr><td>Hesaplama Dönemi</td><td>Hesaplama Yayımlı Tarihi</td><td>Hesaplama Revizyon No</td></tr><tr><td>2019</td><td>06.10.2021</td><td>00</td></tr></table> Amaç: Yüksek olarak hesaplanan Türkiye ulusal elektrik şebekesi emisyon faktörünün bildirilmesidir. Kapsam: Bu belge formunda Faaliyet Temelli Marj (Operating Margin-OM), Gelirim Temelli Marj (Build Margin-BM) ve Birleşik Marj (Combined Margin-CM) Emisyon Faktörlerinin ilgili yıl için hesaplanan değerleri yer almaktadır. Hesaplama Metodolojisi: Hükümetler arası İklim Değişikliği Paneli (IPCC)'nin Temiz Kalkınma Mekanizması Tool 07-V06.0 yöntemi kullanılmıştır. Veri Seti: 1. TEİAŞ Türkiye elektrik üretim-küretim ve kayıplar istatistikleri, 2. Türkiye'nin Ulusal Sera Gazı Emisyonları Raporu kapsamında hazırlanan Ortak Raporlama Formatı- Common Reporting Format (CRF) tablolarda yer alan elektrik üretimi (I.A.1.a.i) emisyon değerleri, 3. TEİAŞ Yüksek Tensiyonlu Daire Başkanlığı'ndan elektrik üretim santrallerinin kronolojik sıra ile devreye alınma tarihleri, santral isimleri, yakıt tipleri, kurulu güç değerleri, hesaplanan yıl için elektrik üretim miktarları, 4. Gold Standard (GS) ve Verified Carbon Standard (VCS) web adreslerinden gönüllü karbon azaltım sertifikası sahipliği durumu ve 5. Temiz Kalkınma Mekanizması-Clean Development Mechanism (CDM) Tool 009-V02.0'dan santral verim rakamları kullanılmıştır. Elektrik Şebekesi Emisyon Faktörü: <table><tr><th>Faktor Türü</th><th>Yıl</th><th>Değeri (tCO₂/MWh)</th></tr><tr><td>Faaliyet temelli marj emisyon faktörü</td><td>2019</td><td>0,7258</td></tr><tr><td>Gelirim temelli marj emisyon faktörü</td><td>2019</td><td>0,4153</td></tr></table> 1  TÜRKİYE ULUSAL ELEKTRİK ŞEBEKESİ EMİSYON FAKTÖRÜ BELGE FORMU Emisyon No: EYEM-01/2021-1708-000 Proje No: 01.08.2020 Faaliyet temelli marj ve gelirim temelli marj emisyon faktörü rakamları birleşik marj emisyon faktörünün hesaplanmasında kullanılmaktadır. Hesaplanan faaliyet temelli marj ve gelirim temelli marj kullanılarak güneş ve rüzgâr kaynaklı elektrik üretim santralleri ve diğer yenilenebilir enerji santralleri için iki farklı birleşik marj emisyon faktörü hesaplanmıştır. <table><tr><th>Faktor Türü</th><th>Yıl</th><th>Değeri (tCO₂/MWh)</th></tr><tr><td>Birleşik marj emisyon faktörü (güneş ve rüzgâr)</td><td>2019</td><td>0,6482</td></tr><tr><td>Birleşik marj emisyon faktörü (diğer yenilenebilir)</td><td>2019</td><td>0,5706</td></tr></table> Yenilenebilir enerji kaynaklı elektrik üretimi ile sağlanacak sera gazı salım (SGS) azaltım hesaplamalarında kaynak türüne göre hesaplanan birleşik marj emisyon faktörleri kullanılmalıdır. EVGED, Çevre ve İklim Daire Başkanlığı, İklim Grubu Telefon: +90 312 212 04 20 - 6902 e-posta: çevre.klim@enerji.gov.tr Yasal Bilgilendirme: Yayımlanan bilgilerin güncelliği, doğruluğu, güvenliği ve tamlığı konusunda tüm titiz çalışmalara rağmen oluşabilecek hatalardan Enerji Verimliliği ve Çevre Dairesi (EVGED) hiçbir taahhüt altına girmez ve sorumluluk kabul etmez. Bilgilerin yanlış kullanılması veya yorumlanması sonucunda doğrudan veya dolaylı bir zarar oluşması halinde EVGED'e hiçbir borç, sorumluluk veya mükellefiyet yüklenemez. EVGED bilgilendirmede yer alan bilgileri önceden bildirilme bulunmaksızın değiştirilebilir veya kullanımı dışı bırakılabilir. 2	Hesaplama Dönemi	Hesaplama Yayımlı Tarihi	Hesaplama Revizyon No	2019	06.10.2021	00	Faktor Türü	Yıl	Değeri (tCO ₂ /MWh)	Faaliyet temelli marj emisyon faktörü	2019	0,7258	Gelirim temelli marj emisyon faktörü	2019	0,4153	Faktor Türü	Yıl	Değeri (tCO ₂ /MWh)	Birleşik marj emisyon faktörü (güneş ve rüzgâr)	2019	0,6482	Birleşik marj emisyon faktörü (diğer yenilenebilir)	2019	0,5706
Hesaplama Dönemi	Hesaplama Yayımlı Tarihi	Hesaplama Revizyon No																							
2019	06.10.2021	00																							
Faktor Türü	Yıl	Değeri (tCO ₂ /MWh)																							
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Faktor Türü	Yıl	Değeri (tCO ₂ /MWh)																							
Birleşik marj emisyon faktörü (güneş ve rüzgâr)	2019	0,6482																							
Birleşik marj emisyon faktörü (diğer yenilenebilir)	2019	0,5706																							
Value(s) applied	CM = (BM x 0.75) + (OM x 0.25) As given by the Ministry of Energy and Natural Resources, built margin is 0.4153 and operating margin is 0.7258. (0.4153 x 0.75) + (0.7258 x 0.25) = 0.4929 tCO₂/MWh																								
Choice of data or Measurement methods and procedures	The coefficients are taken as 0.75 and 0.25 for BM and OM, respectively according to the methodology.																								
Purpose of data	To calculate baseline emission																								
Additional comment																									

B.6.3 Ex ante estimation of SDG Impact

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

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 89,558 MWh of clean energy per annum according to the generation license. 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 to create minimum 11 employment opportunities. It contributes to decent work and economic growth by providing long term job opportunities.

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

Emission factor for the baseline scenario which was calculated by the Republic of Turkey Ministry of Energy and Natural Resources has been used. Accordingly, the project leads to mitigation of 44,145 tCO₂ per annum.

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

SDG 13

Year	Baseline estimate (tCO ₂)	Project estimate (tCO ₂)	Net benefit (tCO ₂)
2022	44,145	0	44,145
2023	44,145	0	44,145
2024	44,145	0	44,145
2025	44,145	0	44,145
2026	44,145	0	44,145
2027	44,145	0	44,145
2028	44,145	0	44,145
Total	309,018	0	309,018
Total number of crediting years	7 years		
Annual average over the crediting period	44,145	0	44,145

SDG 7

Year	Baseline estimate (MWh)	Project estimate (MWh)	Net benefit (MWh)
2022	0	89,558	89,558

2023	0	89,558	89,558
2024	0	89,558	89,558
2025	0	89,558	89,558
2026	0	89,558	89,558
2027	0	89,558	89,558
2028	0	89,558	89,558
Total	0	626,906	626,906
Total number of crediting years	7 years		
Annual average over the crediting period	0	89,558	89,558

SDG 8

Year	Baseline estimate (number of people employed by the project)	Project estimate (number of people employed by the project)	Net benefit (number of people employed by the project)
2022-2028	0	At least 11 people	At least 1 people
Total	0	At least 11 people	At least 1 people
Total number of the crediting years	7 years		

B.7. Monitoring plan

B.7.1 Data and parameters to be monitored

SDG 7

Data / Parameter	EG _{PJ,grid,y}
Unit	MWh/yr

Description	Quantity of electricity generated and supplied by the project power plant to the consumers/electricity consuming facility i in year y
Source of data	Electricity meter(s) and EPIAŞ records will be used
Value(s) applied	Estimated annual generation forming the basis for emission reduction calculation is 89,558 MWh/year
Measurement methods and procedures	EPIAŞ (which is one of the TEIAS association) records will be used for $EG_{PJ,grid,y}$ calculation. Records taken by metering devices will be used for cross-check purposes.
Monitoring frequency	Continuous measurement and at least monthly recording
QA/QC procedures	Two calibrated mmeters are back up each other. Maintenance and calibration of the metering devices are made by TEIAS. If there is a noticeable difference between the readings of two devices, maintenance and tests of the metering devices and the associated equipment is done before waiting for the periodical maintenance. The meters also comply with EPDK 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) As per the regulations, calibration is valid for 10 years³⁶
Purpose of data	To calculate the baseline emission value

³⁶ <http://www.resmigazete.gov.tr/eskiler/2008/08/20080807-3.htm>

Additional comment	-
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SDG 13

Data / Parameter	Emissions Reductions in tCO ₂
Unit	tCO ₂
Description	Reduction of CO ₂ emissions due to implementation of project activity
Source of data	Electricity generated by the project and Turkey's national electricity grid emission factor which is provided by Ministry of Energy and Natural Resources will be used as reference in calculation of the emission reduction.
Value(s) applied	National electricity grid emission factor is 0.4929 tCO₂ /MWh. Estimated annual emission reduction is 44,145 tonnes of CO ₂ .
Measurement methods and procedures	The project will contribute to "Emissions Reductions or Removals and/or Adaptation to Climate Change" by reducing CO ₂ emissions caused by fossil fuel-fired power plants that are displaced due to the project activity, in line with GS4GG principles. The Project will contribute to SDG Target 13.3 through an expected amount of 44,145 tonnes of CO ₂ e, which represent direct and quantifiable impact on climate security.
Monitoring frequency	Continuous measuring, monthly recording
QA/QC procedures	-
Purpose of data	To calculate the baseline emission value; and also to monitor the contribution to SDG 13 (Take urgent action to combat climate change and its impacts)
Additional comment	-

Data / Parameter	APJ
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Unit	m2
Description	Area of the reservoir measured in the surface of the water, after the implementation of the project activity, when the reservoir is full
Source of data	Project site & maps & satellite data
Value(s) applied	6,776 m2
Measurement methods and procedures	Measured from topographical surveys or maps
Monitoring frequency	Once in each monitoring period
QA/QC procedures	-
Purpose of data	Maximum area is already calculated in feasibility report and considered in calculations. Annual measurements are not expected to be higher than this value.
Additional comment	-

SDG 8

Data / Parameter	Quantitative employment and income generation
Unit	Number of employed staff
Description	Creating job opportunities
Source of data	Social Security Records
Value(s) applied	At least 11 people
Measurement methods and procedures	-
Monitoring frequency	Annually
QA/QC procedures	-
Purpose of data	To monitor the contribution to SDG 8
Additional comment	-

Data / Parameter	Qualitative employment
Unit	Number of trainings provided

Description	The project owner will give HSE trainings and/or vocational trainings (when needed)
Source of data	Training records, attendance lists and/or certificates
Value(s) applied	-
Measurement methods and procedures	Training records, attendance lists and/or certifications will be evaluated.
Monitoring frequency	Annually
QA/QC procedures	-
Purpose of data	To assess the contribution to Principle 3
Additional comment	-

B.7.2 Sampling plan

N/A

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 is measured and recorded via meters sealed by TEIAS for billing purposes. Therefore, no new additional protocol is needed for monitoring emission reduction. Power Plant Manager is 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 is responsible for calculating the emission reduction subject to verification. Generation data is used to prepare monitoring reports which will be used to determine the vintage from the project activity. These reports are submitted to the duly authorized and appointed Designated Operational Entity 'DOE' 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.

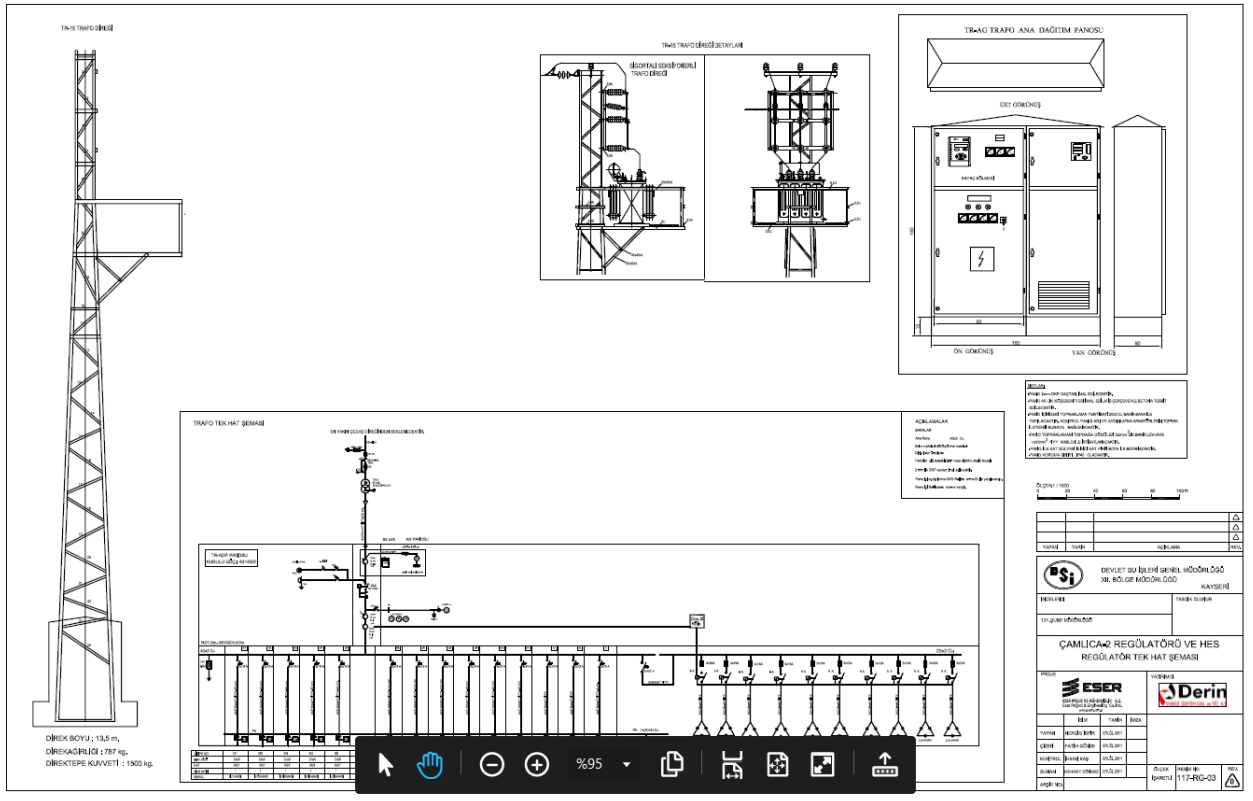
Accounting Manager: Responsible for keeping data about generation and consumption.

GTE Karbon Sürdürülebilir Enerji Eğitim Danışmanlık ve Ticaret A.Ş.: Responsible for emission reduction calculations, preparing monitoring report and periodical verification process.

Installation of meter and data monitoring are carried out according to the regulations by TEIAS. Two metering devices (one of them used as spare) are used for monitoring the electricity generated by the power plant. Readings are 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 read from EPIAS web site (<https://www.epias.com.tr/>) which is accessible using a password provided to electricity generation companies. Site records are used for cross-check.

All data are kept for at least two years after the crediting period for QA/QC purposes. Calibration of the metering devices is made on 03/05/2014 and sealed before the commissioning of the power plant. According to the related regulation on calibration of metering devices, next calibration will be done in 2024. The maintenance and test study on metering devices are done and controlled by TEIAS and when there is an inconsistency between two devices (main and spare one). The meters are EMH LZQJ-XC with serial numbers of 4241381 (main meter) and 4241382 (spare meter) with accuracy class of 0.5s.

Single line diagram of the project is below:



SECTION C. DURATION AND CREDITING PERIOD

C.1. Duration of project

C.1.1 Start date of project

Start date of project activity is determined as 01/05/2012, start of construction activities.

C.1.2 Expected operational lifetime of project

The expected operational lifetime of the project is about 44 years as per the license issued.

C.2. Crediting period of project

C.2.1 Start date of crediting period

Crediting period start date is 01/01/2022 and the total length is 7 years. End date of crediting period is 31/12/2028.

C.2.2 Total length of crediting period

7 years

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 summarised below.

Principles	Mitigation Measures added to the Monitoring Plan
Principle 9.4	Water Quality and Quantity - Water Quality and Quantity – Waste water will be collected in a septic tank and then transported to a treatment plant where it will be treated to meet standards in accordance with guidelines and national regulations.
Principle 9.4	Water Quality and Quantity - Amount of water released as minimum flow Flow is monitored continuously and recorded by the gauging device.
Principle 9.5	Hazardous and Non-hazardous Waste - Proper Management of Waste Oil - Project owner committed to proper collection of waste oil from equipment in line with regulation # 26952 on control of waste oils.

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?	As stated in Gold Standard Gender Policy document, “foundational gender sensitive certification” which is mandatory for every project requires compliance with the gender ‘do no harm’ safeguard, gender-gap analysis and gender sensitive stakeholder consultations. Although the project is a renewable energy project and does not have negative impacts on men and women, it complies with the criteria mentioned. Moreover, 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.
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Question 2 - Explain how the project aligns with existing country policies, strategies and best practices	A gender-equal strategy is implemented by creating employment opportunities for both man and woman without discrimination. According to the Woman Empowerment Strategy Paper and Action Plan prepared by the Ministry of Family and Social Policies (2018), there are 21 targets classified under 5 main fields in order to enhance participation of women to the society. In this action plan regarding the years 2018 – 2023, economy and employment-oriented strategies are represented for women since the labor force activity of women is not at desired level compared to the EU countries. According to 2017 statistics tabulated in the report, labor force activity of women is declared as 33.6% and it is aimed that this percentage will be 41% in 2023. Accordingly, the project shows parallelism with the national strategies developed for women. Moreover, all men and women can benefit from project outputs without any discrimination under the SDG 9.
Question 3 - Is an Expert required for the Gender Safeguarding Principles & Requirements?	Not required.
Question 4 - Is an Expert required to assist with Gender issues at the Stakeholder Consultation?	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

There is no stakeholder grievance/complaint from the local stakeholders in the beginning of the second crediting period. There is no grievance / complaint received during the first crediting period. There had not been any major inputs from the

stakeholders in the first crediting period, they are aware that the project have been operational for a long time and project contributed to the area. The plant staff and the nearby villagers are in communication all the time since there are many employees of the plant living in the nearby villages. This enhances the communication between the villages and the power plant. The culture of communication in the area is verbal, therefore, people prefer to convey their messages verbally. Due to Covid-19 pandemic that led to lockdowns and many restrictions around the globe, as well as in Turkey, a physical complementary stakeholder meeting could not be carried out.

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 grievance logbook is kept at the village heads' offices in two different villages which are closest to the power plant. The villages are Çamlıca Village and Yeşilköy Village. Stakeholders can fill in the logbook whenever they have a complaint, request or an input, which is regularly checked by the project manager. Stakeholders are also welcome to directly contact the power plant staff as well.
GS Contact (mandatory)	help@goldstandard.org
Other	HGG Enerji Üretim A.Ş Murat Müftüoğlu muratmuftuoglu@hggenerji.com.tr Tel: +90 384 511 25 66

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	1.Yes 2.Yes	1.Turkey has ratified European Convention on Human Right on 10/03/1954 ³⁷ . Therefore, the project is not expected to violate the rules regarding human rights. 2.Turkey has ratified European Convention on Human Right on 10/03/1954. Therefore, the project is not	1.No mitigation measure is required for this indicator. 2.No mitigation measure is required for this indicator.

³⁷ https://www.echr.coe.int/Documents/CP_Turkey_ENG.pdf

regards to participation and inclusion		expected to violate the rules regarding human rights.	
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 nondiscrimination, equal treatment, and equal pay for equal work 3. The Project shall refer to the country's national gender strategy or equivalent national commitment to aid in assessing gender risks 4. (where required) Summary of opinions and recommendations of an Expert Stakeholder(s)	1.Yes 2.Yes 3.Yes 4.Yes	1.Turkey has ratified ILO convention 100, 111, 122 and 142, which provides gender equality. It also shows parallelity with national strategies prepared for women employment by creating opportunities for all. 2.Turkey has ratified ILO convention 100, 111, 122 and 142, which provides gender equality. It also shows parallelity with national strategies prepared for women employment by creating opportunities for all. 3.Turkey has ratified ILO convention 100, 111, 122 and 142, which provides gender equality. It also shows parallelity with national strategies prepared for	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.

		women employment by creating opportunities for all. 4.Turkey has ratified ILO convention 100, 111, 122 and 142, which provides gender equality. It also shows parallelity with national strategies prepared for women employment by creating opportunities for all.	
Principle 3. Community Health, Safety and Working Conditions			
1. The Project shall avoid community exposure to increased health risks and shall not adversely affect the health of the workers and the community	Yes	Turkey has ratified ILO convention 155 and about work safety and precautions ³⁸	Staff will be trained during construction operation phases, such as general HSE, risk, first aid, etc.
Principle 4.1 Sites of Cultural and Historical Heritage			

³⁸ https://www.ilo.org/global/standards/subjects-covered-by-international-labour-standards/occupational-safety-and-health/WCMS_356966/lang--en/index.htm

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 intangible forms of culture were observed in the project area.	No mitigation is required for this indicator.
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	No relocation needed for the project implementation.	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?	Yes	a) Project activity involves expropriation but no resettlement. Hence there is no land tenure situation within project area. b) There is no uncertainty. Related permits and payments for expropriation were carried out.	No mitigation measure is required for this indicator.
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	There is no indigenous people affected by the project implementation.	No mitigation measure 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	The project does not engage in, contribute to or reinforce corruption of any kind.	No	Turkey has ratified several conventions on bribery and corruption including OECD and UN conventions
Principle 6.1 Labour Rights			
1. The Project Developer shall ensure that all employment is in compliance with national labour occupational health and safety laws and with the principles and standards embodied	1.Yes 2.Yes 3.Yes 4.No 5.Yes	1.Project owner ensures that all employment and HSE activities will be done according to the Law of Health And Safety. ³⁹ 2.Turkey has ratified ILO 87 and 98 conventions.	1. No mitigation is required for this indicator. 2.No mitigation is required for this indicator. 3. No mitigation is required for this indicator. 4. No mitigation measure is required for this indicator.

³⁹ <https://www.mevzuat.gov.tr/MevzuatMetin/1.5.6331.pdf>

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		3.All employee will be recruited according to the national legislations. 4. Turkey is a party of IPEC^{40, 41} since 1992 and ratified ILO convention 138 and 182⁴². 5. Turkey has ratified ILO convention 155 and about work safety and precautions.	5. Staff will be trained during construction operation phases, such as general HSE, risk, first aid,etc.
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⁴⁰ <http://www.ilo.org/ipec/programme/lang--en/index.htm>

⁴¹ <http://www.ilo.org/ipec/Regionsandcountries/lang--en/index.htm>

⁴² <http://www.ilo.org/public/turkish/region/eurpro/ankara/about/sozlesmeler.htm>

e) Modalities on termination of the contract with 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			
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	As a renewable energy power plant, the project contributes to "Emissions Reductions or Removals and/or Adaptation to Climate Change" by reducing CO2 emissions caused by fossil fuel-fired power plants that are displaced due to the project activity, in line with GS4GG principles with the mitigation of an expected amount of 44,145 tonnes of CO2e.	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,	No	Project does not use any local fuel resource. It is connected to the national grid and supply 89,558 MWh additional energy to the grid. Internal consumption which indicates	No mitigation measure is required for this indicator.

biomass) that provides for other local users?		the usage in the project site will be read from monthly records taken from the meters.	
Principle 8.1 Impact on Natural Water Patterns/Flows			
Will the Project affect the natural or pre-existing pattern of watercourses, ground-water and/or the watershed(s) such as high seasonal flow variability, flooding potential, lack of aquatic connectivity or water scarcity?	No	Since the Project is run-of-river type without a storage capacity, quality and the quantity of water is not affected by the project activity compared to the baseline scenario.⁴³ Project use excess water from the channel and releasing flow from the channel is within the responsibility of the project owner signed a water usage agreement with DSI.⁴⁴	Monitoring is done by Flow Monitoring Stations of DSI. Required actions will be taken according to the monitoring data collected by the stations.

⁴³ Project Feasibility Report, page-11

⁴⁴ Project Feasibility Report, page-11

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?	Potentially	The Project does not have any serious effects on erosion or water body instability since land use is limited. There is only a possibility of erosion in the excavated and slopy areas.⁴⁵ However, there are pre and post measures taken in order to prevent soil loss.	In order to prevent erosion, existing roads will be used as much as possible. The project will avoid constructing new roads for access. Secondly, all staff will be informed via trainings, posters and other elements to determine the borders of limited working area and not to cause any disturbance out of this land. Thirdly, topsoil will be properly managed and re-used for afforestation. Other preventive measures will be: 1. Material cumulants will be left in order to prevent bottom scouring. 2. Surface of the soil will be covered with erosion blankets, if needed.

⁴⁵ Ecosystem Assessment Report, page 25

			3. Local and adaptive trees will be used in afforestation. 4. Continuous monitoring⁴⁶ Since possible erosion in specific zones on the river bed may cause water turbidity in surrounding water sources, there are several measures taken in order to prevent sedimented water entrance. These measures are sediment preventer, silt fences and hay bales. In addition, temporary structures such as cofferdams will be constructed in order to minimize turbidity.⁴⁷
Principle 9.1 Landscape Modification and Soil			
Does the Project involve the use of land and soil for production of crops or other products?	No	Land is limited within the project construction phase and there is no negative effect on use of land and soil for	No mitigation measure is required for agricultural lands. However, the project will implement plantation in order

⁴⁶ Ecosystem Assessment Report, page 25, 28,32

⁴⁷ Ecosystem Assessment Method, page 37

		production of crops. Only construction of water transfer channel caused excavation of soil which is placed on top of present landscape and the area was forested.⁴⁸ The river bed existing between Camlica II regulator and HEPP has 2 km long valley-canyon type morphology. Therefore, there is no agricultural and/or potentially affected crop land depending on river irrigation due to the steep slope of the area.⁴⁹	to prevent top soil loss and restore habitat. For this, mostly leafy plants will be used according to the geographical properties of the area. Moreover, plants with vertical forms will be used in planes while groundcovers will be preferred in steep slopes. Local, adaptive and non-competitive plants will be selected.⁵⁰
Principle 9.2 Vulnerability to Natural Disaster			
Will the Project be susceptible to or lead to increased	No	Project area is located in the 4th degree earthquake zone	Proper plantation will be done in order to prevent landslide.

⁴⁸ Project Feasibility Report, page 3-7

⁴⁹ Camlica II HEPP Hydrogeology and Hydrobiology Report, Page 39

⁵⁰ Ecosystem Assessment Method, page 43-47

vulnerability to wind, earthquakes, subsidence, landslides, erosion, flooding, drought or other extreme climatic conditions?		and therefore the earthquake risk is quite low moreover all the design and construction work performed in accordance with relevant regulations ^{51, 52} There is no flooding risk according to the Turkey Flood Map . However, there may be potential landslide risk due to excavation for the water channel.	Moreover, plant roots will be remained as much as possible. Mini sluiceways will be constructed where cut of slopes is needed.
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 GMOs in their processes and production)?	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.

⁵¹ Project Feasibility Report, page 92

⁵² Regulation: Afet Bölgelerinde Yapılacak Yapılar Hakkındaki Yönetmelik, numbered 26582, dated 14.07.2007

Principle 9.4 Release of pollutants			
Could the Project potentially result in the release of pollutants to the environment?	Yes	Excavation soil, domestic waste water and solid waste is expected to be generated. However; these are not result in adverse effects on the environment since managed as per the requirements of national legislation ⁵³ . The nearest settlement is Çamlıca Villagewhich is 1500 meters far away from the project area. Noise levels are below the limits of Turkish legislation ⁵⁴ .	Project does not have any adverse impact on water quality and quantity. Domestic waste water is collected and disposed to the sewage system. Domestic solid waste handled in accordance with related regulation ⁵⁵ . All the other generated waste handled according to the national regulation "Turkish Water Pollution Control Regulation". Excavation was properly stored in designated areas and used for aff. The project does not have any point or fugitive emission and heating source emissions during operation other than an emergency diesel generator.

⁵³ Project Feasibility Report, page 64

⁵⁴ Project Feasibility Report, page 53-58

⁵⁵ Regulation: Katı Atıkların Kontrolü Yönetmeliği, numbered 20814, dated 14.03.1991

			Moreover, no mitigation measure is required for noise pollution due to related justification.
Principle 9.5 Hazardous and Non-hazardous Waste			
Will the Project involve the manufacture, trade, release, and/ or use of hazardous and non-hazardous chemicals and/or materials?	Yes	Project does not create any adverse impact on the local environment due to the handling, storage, transport, and disposal of the hazardous waste generated during and after the construction and is comply with the requirements of the Turkish Regulation ⁵⁶ .	Waste oil from equipment is collected properly in line with the relevant regulation and disposed via accredited abatement companies. Waste oil is disposed in line with regulation # 26952 on control of waste oils ⁵⁷ . The plant does not use high amounts of oil, once the containers are full, waste oil will be removed by an

⁵⁶ Project Feasibility Report, page 64, 97

Regulation of Disposal of Hazardous wastes (Published in official gazette dated 14.03.2005 and numbered 25755)

Regulation of Disposal of Solidwastes (Published in official gazette dated 14.03.1991 and numbered 20814)

Regulation on assessment and management of environmental noise (Published in official gazette dated 07.03.2008 and numbered 26809)

⁵⁷ Regulation: Disposal of waste oil – “Atık Yağların Kontrolü Yönetmeliği”, numbered 26952, dated 30.07.2008
<http://www.mevzuat.gov.tr/Metin.Aspx?MevzuatKod=7.5.12290&MevzuatIliski=0&sourceXmlSearch>

			authorized company or municipality services. Residential wastes and solid wastes due to daily operation of the personnel will also be stored in containers under confined conditions. Wastes will either be collected by the local municipality or dumped to sites designated by the local authorities. In order to mitigate noise pollution, explosives will only be used during specific times of day and will be performed under supervision of regional authorities. Dust emissions calculations are made, and it has been concluded that it is under legal limits to use 6.4 kg of explosives/day taking into account the closest settlement. Wastewater generated will be collected in a cesspool and later will be draught to the nearest sewage system by vacuum truck.
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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	Project does not involve any harvesting activity.	No mitigation measure is required 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			
Will the Project involve animal husbandry?	No	The project is not relevant since it is a renewable energy project.	No mitigation is needed 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?	Potentially	The project does not affect any identified sensitive area.	Fish passages were designed in order to allow fish communities to pass through the river. The riverbed is protected by preserving and also planting new plants in

			order to prevent sedimentation.
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?	No	There is no endangered species in the project area.	No mitigation is needed for this indicator.

APPENDIX 2- CONTACT INFORMATION OF PROJECT PARTICIPANTS

Organization name	HGG Enerji Üretim A.Ş
Registration number with relevant authority	-
Street/P.O. Box	Oran Mahallesi Turan Güneş Bulvarı
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State/Region	Çankaya
Postcode	-
Country	Turkey
Telephone	+90 384 511 25 66
E-mail	-
Website	https://www.hgg.com.tr/TR/Default2.aspx
Contact person	Murat Müftüoğlu
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Salutation	Mr.
Last name	Müftüoğlu
Middle name	-
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Mobile	-
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Organization name	GTE KARBON SÜRDÜRÜLEBİLİR ENERJİ EĞİTİM DANIŞMANLIK VE TİC. AŞ
Registration number with relevant authority	-
Street/P.O. Box	Mustafa Kemal Mah 12118. Cad. No:4
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