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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**

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Key Project Information

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KEY PROJECT INFORMATION

GS ID of Project	GS1208
Title of Project	CEMEL HYDRO BUNDLE
Time of First Submission Date	09/06/2022
Date of Design Certification	01/10/2013 (Registration date) 01/09/2022 (Design Renewal Certification)
Version number of the PDD	04
Completion date of version	13/03/2023
Project Developer	GTE KARBON SÜRDÜRÜLEBİLİR ENERJİ EĞİTİM DANIŞMANLIK VE TİC. AŞ (Project Developer)
Project Representative	HGG Enerji Üretim A.Ş. (Project Owner)
Project Participants and any communities involved	1- HGG Enerji Üretim A.Ş. (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	N/A
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)	13.3 “Improve education, awareness-raising and human and institutional capacity on climate change mitigation, adaptation, impact reduction and early warning” CEMEL HYDRO BUNDLE, 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.	36,451 tonnes of CO2e per annum	tCO ₂ e/yr
7 Affordable and Clean Energy	7.2 “By 2030, increase substantially the share of renewable energy in the global energy mix.” Increasing the number and percentage of renewable energy power plants such as hydro 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.	73,950 MWh/yr	MWh/yr
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” 8.8 “Protect labour rights and promote safe and secure working environments for all workers, including migrant workers, in particular women migrants, and those in precarious employment”	Around 28 people to be employed	Number of people employed by the project

9 Industry, Innovation and Infrastructure	9.1 “Develop quality, reliable, sustainable and resilient infrastructure, including regional and transborder infrastructure, to support economic development and human well-being, with a focus on affordable and equitable access for all”	The project provides infrastructural benefits for all.
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SECTION A. DESCRIPTION OF PROJECT

A.1 Purpose and general description of project

The Cemel HEPP project is a bundled a run-of-river type project located on Kızılırmak River, within the boundaries of Avanos district of Nevşehir province. The project is licensed in 14/12/2006¹ and in 09/02/2011 all the legal rights of the project is given to ZEYNEP ENERJİ ÜRETİM SANAYİ A.Ş. which later referred as HGG Enerji Üretim Anonim Şirketi for 44 years 11 months. The hydroelectric power plant is composed of: - Weir house - Derivation channel - Power House - Tail water channel².

i. The location of the project activity

Cemel HEPP project is located on Kızılırmak River, within the boundaries of Avanos district of Nevşehir province.

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

The project consists of three cascade projects, each having its own turbines and generators which are used to transform the potential energy of water to mechanical energy at a first stage and later into electrical energy. This bundled project is composed of 6.567 MWe Cemel I HEPP, 7.055 MWe Cemel II HEPP and 6.4 MWe Cemel III HEPP³ on the mid-section of Kızılırmak River basin.

¹ PIF, page 9

² PIF, page 35

³ Equipment Agreement

Electricity generated at project is fed to the national grid via Avanos substation with energy transmission line of 8 km from Cemel I HEPP, 3.6 km Cemel II HEPP and 4.4 km from Cemel III HEPP.⁴ Project is not located within any protected area as per the international agreements ratified by Turkey.⁵ Project includes an impoundment type weir and will cause limited land use since there exist no conveyance line and penstock is built at the bottom of the weir. There exist several Dams (Hirfanlı, Yamula, Bayramhacılı and Sarıhıdır) on the upstream and downstream of the project⁶. There exist agricultural areas around the river bed and several old sand quarry sites which will not be affected by the project activity due to the project type.

The purpose of this project is to generate electricity by using the existing water without constructing any reservoir. The project type is run-of-river type project.

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 has a capacity of 21.6 MWm and 20.4 MWe and an expected production of 73.95 GWh. This corresponds to an average of 36,451 tCO₂e emission reductions when all plants are commissioned.

Main goals of the Cemel HEPP Projects include;

⁴ PIF, page 42

⁵ PIF, page 168

⁶ PIF, page 166

- Utilization of the hydroelectric potential of Turkey in order to meet rapidly increasing electricity demand and contribute achieving energy security.
- Increase share of HEPPs in electricity generation mix of Turkey and reduction of GHG emissions.
- Contribute to the national economic development by creating direct and indirect job opportunities during construction and operation phases.
- Reduce import dependency of fossil fuel dominated 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 sustainable development project not only contributes to emission reduction through use of renewable resources and creating job opportunities, it also contributes sustainable development goals in the region as detailed in GS passport. In terms of environmental impact, project is considered to have positive impact on air quality due to avoided NO_x, PM and SO_x emissions whereas no negative impact on water quality other pollutants and biodiversity has been identified. Since the project is a compact type project and there is no diversion, project does not have any impact in terms of minimal flow or decreased water flow rate.

According to the research conducted by State Planning Organization (SPO) on socio-economic levels of districts in Turkey, Avanos district is ranked as 227th among 872 districts and in terms of development level the area is classified as third(out of six) group. About 70.9% of the population works on agriculture and 21.0% works on service sector (mainly tourism) whereas only 1.28% works on industry. The Avanos district is ranked as 291st in terms of per capita income. In that respect, direct and indirect contribution of project activities such as employment and supplying of needs from the region will have a significant effect on local economy.

In addition to contribution to local economy, project will also contribute to use of local and renewable resources to meet the increasing energy demand of Turkey and reduce dependency on fossil fuels. According to Turkish Electricity Transmission Company

(TEIAS) statistics, in 2010 about 73.8%⁷ of the electricity has been generated via thermal power plants whereas 46.5% was from natural gas (NG) power plants which is fully imported and 21.8 bn m³ NG has been consumed⁸. In terms of fuel dependency, corresponding to 42.286 GWh/year estimated generation, proposed project is expected to replace about 16.4 million m³ NG and contribute to balance of payments which will, in addition, increase air quality and access to affordable energy services in national level.

Table 2. Milestones of the Project

MILESTONE	DATE
CONNECTION AGREEMENT	20/03/2007
PRELIMINARY EIA	16/11/2009
EIA EXEMPTION LETTER	04/06/2010
WATER RIGHT UTILIZATION AGREEMENT	05/11/2010
LICENSE ISSUANCE	09/02/2011
BOARD DECISION ABOUT CARBON REVENUES	10/06/2011
CONSTRUCTION SUBCONTRACTOR AGREEMENT *	13/07/2011
START OF CONSTRUCTION	27/07/2011
EM EQUIPMENT PURCHASE CONTRACT	13/09/2011
CARBON AGREEMENT	20/10/2011
COMMISSIONING DATE (CEMEL I)	27/06/2013
COMMISSIONING DATE (CEMEL II)	01/09/2013
COMMISSIONING DATE (CEMEL III)	01/09/2015
FIRST CREDITING PERIOD	01/07/2015 – 30/06/2022
SECOND CREDITING PERIOD	01/07/2022 – 30/06/2029

A.1.1. Eligibility of the project under Gold Standard

Project activity involves construction of a 20.4 MWe hydro 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.

⁷[http://www.teias.gov.tr/T%C3%B0CrkiyeElektrik%C4%B0statistikleri/istatistik2010/front%20page%202010%C3%A7i%C3%A7ek%20kitap/uretim%20tuketim\(22-45\)/36.xls](http://www.teias.gov.tr/T%C3%B0CrkiyeElektrik%C4%B0statistikleri/istatistik2010/front%20page%202010%C3%A7i%C3%A7ek%20kitap/uretim%20tuketim(22-45)/36.xls)

⁸<http://www.teias.gov.tr/T%C3%B0CrkiyeElektrik%C4%B0statistikleri/istatistik2010/front%20page%202010%C3%A7i%C3%A7ek%20kitap/yak%C4%B1t46-49/47.xls>

The project meets the 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 meets eligibility criteria as per the GS4GG principles and requirements;

- Project is a renewable energy (hydro power) installation activity
- Project activity include 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 round.
- Project outcomes are real 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 20.4 MWe hydro power plant 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 SDSs 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 doesn't claim Green or White certificates or equivalents that may result in double counting as a result of carbon dioxide emission reduction purposes. Project is not registered and also 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 amount 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 Communiqué on Procedures for Registration of Greenhouse Gas Emission Reduction Projects⁹.

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

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

ix. Greenhouse Gases

⁹ <http://www.mevzuat.gov.tr/Metin.Aspx?MevzuatKod=9.5.14195&MevzuatIliski=0&sourceXmlSearch=>

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 OECD¹⁰, a written declaration of non-ODA for the project activity is submitted.

Renewable Energy Activity Requirements - Annex A¹¹

	Assessment	Answers
a	Competing Uses of Water Resources at the Project Location	The project is subject to water utilization right agreement dated 05/11/2010. Nearby irrigation facilities or fishing activities will not be affected. The water in the river is managed and monitored by DSI (State Hydraulic Works).
b	Ecological Flow & Quality Assurance And Control Procedures	According to the letters received from DSİ (Devlet Su İşleri – State Hydraulic Works) on 04/04/2013 (1), 29/08/2013 (2) and 10/06/2015 (3), that ecological flow monitoring is not required. The water is managed by DSI, therefore, DSI would contact the PP in case of any problems. As per the “Water Utilization Agreement” between the PP and DSI, all rules are set and agreed by both parties, dated 05/11/2010. As mentioned in page 1-2 (Point 4) in this agreement “<i>Within the framework of the works carried out by DSI in parallel with the basin development of the region where hydroelectric power generation facilities are located, within the scope of existing, under construction and conceivable projects in the basin, for drinking, utility, tourism and industrial water supply, irrigation, flood protection and energy purposes and for other purposes other than these. Operational plans that will determine the amount and timing of water to be allocated to other organizations</i>

¹⁰ <https://www.oecd.org/dac/financing-sustainable-development/development-finance-standards/DAC-List-of-ODA-Recipients-for-reporting-2022-23-flows.pdf>

¹¹ <https://globalgoals.goldstandard.org/201-ar-community-services-activity-requirements/>

		and legal entities are made by DSI and notified to the company. The company is obliged to comply with these plans.” Since the project is run-off-river type, the water used for the electricity generation is released back to river within 50 m and at least 1 m depth of water will always be available in weir area. Since there is no conveyance line, no minimum flow is determined or gauging station is required for the project activity. However, the flow metering stations also alerts (sound and light) when the flow in the river is so high. After the project implementation, the overflow incidents were minimized since the water was being controlled. Also the project is subject to water utilization right agreement dated 05/11/2010. Nearby irrigation facilities or fishing activities will not be affected. The project is along the river therefore it does not create any interruption to the river-water potential, the water is still continuous.
c	Effect on Groundwater Level	The project does not utilize or divert groundwater therefore, groundwater is not affected by this project.
d	Fish Passages and Screens at the Water Intake Structure	The fish passage was designed in line with internationally recognised guidance and approved by experts. The species living in the area require a 20-25 cm depth of water to live undisturbed, produce and feed ¹² . The water intake structure has screens which was installed in line with international standards) to prevent any fish from getting in the turbines as well as any coarse materials.
e	Sediment Management	Sediment management was applied during the construction phase in order not to cause any pollution due to sediments. The methods such as sediment filters and trap assemblies were used.
f	Preventing Soil Erosion	Many trees were planted around the area by the PP. No soil erosion has occurred since the start of operation of the project. All mitigation measures taken have been effective throughout the operational period of the project. No water erosion has been determined during FSR and PIF preparation. Since there exists several large scale dams on the upstream, characteristics of the project (flood barrier) has been prepared accordingly.

¹² Ecosystem Evaluation Report, page 8

A Project Identification File has been prepared for Cemel Hydro Bundle project by an engineering and consultancy firm considering the 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.

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 is given to Zeynep Enerji Üretim Sanayi A.Ş. for 44 years 11 months. The company name has been changed from Zeynep Enerji Üretim Sanayi A.Ş. to HGG Enerji Üretim A.Ş. with a declaration in commercial registry gazette (with a number and the date 10243-12/01/2021).

i) Project owner is also the license holder of the project. Ownership is not transferred from other beneficiaries. Legal documents (generation license etc, and cover letter, terms and conditions) are submitted to VVB or uploaded to the GS registry.

ii) Generation license issue by EPDK (EMRA-Energy Market Regulatory Authority) gives the rights to install and operate hydro power plant in the defined site to project owner.

iii) Legal right for installation of WTGs and generating electricity on project site is defined by local regulations and secured by generation license as defined above. Land for the project is leased from the government for the generation license period as per the local regulations.

A.2 Location of project

Project site is located in Avanos District, Nevsehir Province 2 km away from the nearest village of Aladdin. Project site is accessible from main road following a 3 km route to Cemel I, 8.5 km to Cemel II and 5.5 km to Cemel III.

Table 3. Project coordinates

CEMEL I HEPP	COORDINATES	
	WGS84 (DMS)	ED50
LATITUDE	38° 43' 25.93" N	657453.13
LONGITUDE	34° 48' 40.51" E	4287692.14
CEMEL II HEPP	COORDINATES	
	WGS84 (DMS)	ED50
LATITUDE	38° 45' 15.48" N	651561.65
LONGITUDE	34° 44' 39.19" E	4290856.96
CEMEL III HEPP	COORDINATES	
	WGS84 (DMS)	ED50
LATITUDE	38° 45' 25.58" N	648523.54
LONGITUDE	34° 42' 33.57" E	4291210.62
CEMEL I HEPP REGULATOR AXIS	COORDINATES	
	WGS84 (DMS)	ED50
LATITUDE	38.741016	657675
LONGITUDE	34.814239	4289600
CEMEL I HEPP WEIR HOUSE	38.741471	657650
	34.813963	4289650
CEMEL II HEPP REGULATOR AXIS	COORDINATES	
	WGS84 (DMS)	ED50
LATITUDE	38.763616	652340
LONGITUDE	34.753411	4292005
CEMEL II HEPP WEIR HOUSE	38.763262	652300
	34.752942	4291965
CEMEL III HEPP REGULATOR AXIS	COORDINATES	
	WGS84 (DMS)	ED50
LATITUDE	38.771499	648100
LONGITUDE	34.704800	4292800
CEMEL III HEPP WEIR HOUSE	38.771142	648080
	34.704561	4292760

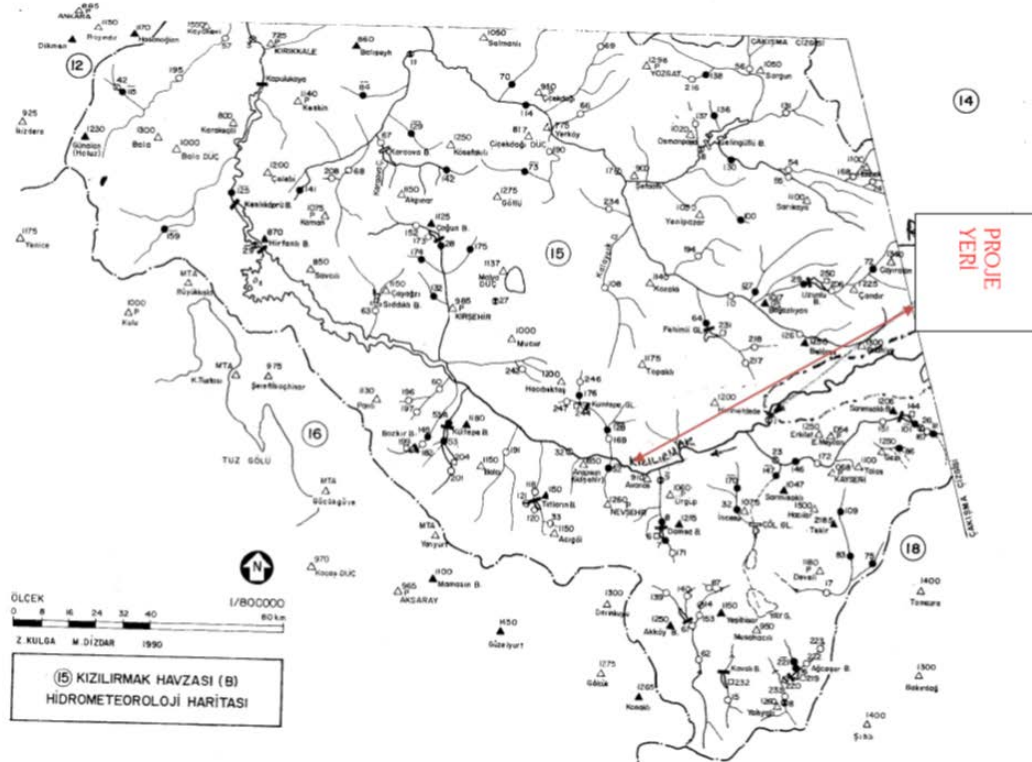


Figure 1. Layout of the project on the site map

A.3 Technologies and/or measures

Project activity involves establishing a compact run-of-river type HEPP to utilize the running water of Kızılırmak River. Project does not have conversion line to divert water. The project consists of three cascade projects, each having its own turbines and generators which are used to transform the potential energy of water to mechanical energy at a first and later into electrical energy.

Project is located within central Anatolia and mainly influenced by continental climate. Average temperature is 10.5°C and precipitation is 331.70 mm. No extreme events are observed within the project site.

Hydrology: No water erosion has been determined during FSR and PIF preparation. Since there exists several large scale dams on the upstream, characteristics of the project (flood barrier) has been prepared accordingly and flood flow rates has been determined as follows:

Q5=516.0 m³/s Q10= 635.05 m³/s Q100= 1167.62 m³/s Q500= 1563.44 m³/s
Q1000= 1729.57 m³/s

Water logging in the region is made by DSI and feasibility of the project has been studied using DSI data obtained from existing gauging stations and results have been given in table 4-66 of the FSR.

There exists no wetland or protected area within the project site.¹³

The presented structural format is the same for all three Cemel. Technical specifications of the all three Cemel is tabulated below:

Table 4. Technical characteristics¹⁴

	CEMEL I	CEMEL II	CEMEL III
Drainage Area	19613.0 km ²	19613.0 km ²	19613.0 km ²
Average Flow Rate	66.63 m ³ /s	66.63 m ³ /s	66.63 m ³ /s

¹³ PIF, page 170

¹⁴ PIF, page 1-2, Equipment Agreements

Project Flow Rate	135 m ³ /s	135 m ³ /s	135 m ³ /s
Crest Elevation	922,5 m	916.0 m	909.5 m
Normal Water Elevation	921.5 m	915.0 m	908.5 m
Minimum Water Elevation	921.0 m	914.5 m	908.0 m
Thalweg Elevation	916.5 m	910.0 m	903.5 m
Tailwater Elevation	915.52 m	909.31 m	902.42 m
Gross Head	5,98 m	5.69 m	6.08 m
Net Head	5.941 m	5.681 m	6.079 m (average)
Length Of Cofferdam And Derivation Channel Crest	85m / 147m	87m / 165m	129m / 109m
Type Of Weir	Draw-door weir	Draw-door weir	Draw-door weir
Turbine Type	Pit-type Kaplan turbines	Pit-type Kaplan turbines	Pit-type Kaplan turbines
Number Of Unite	2	2	2
Type Of Generator	Horizontal Asynchronous; 50 Hz	Horizontal Asynchronous; 50 Hz	Horizontal Asynchronous; 50 Hz
Efficiency Of Turbines At 135 m³/s	0.92	0.92	0.92
Power Factor Of Generator	0.85	0.85	0.85
Efficiency Of Generator At Nominal Capacity¹⁵	96.78%	96.78%	96.78%

i. Cemel HEPP has 6 turbines. The total electrical output capacity will be limited to 20.4 MWe according to the generation licence.

ii. The lifetime of the hydropower plant is stated as 44 years, 11 months and 2 days in the generation licence.

iii. The electricity delivered to the grid by the project activity is generated using a renewable source by harnessing the hydro power, instead of utilizing GHG emitting sources. Hence, the project contributes to SDG 7 by generating renewable energy and SDG 13 by reducing emissions.

A.4 Scale of the project

It is a large-scale project having 20.4 MWe installed and a production capacity of 73.95 GWh with 36,451 tonnes estimated CO₂ reduction.

A.5 Funding sources of project

Project is financed by the company's own resources. No public funding was used. The project activity does not receive public funding. The project does not receive or benefit from Official Development Assistance (ODA).

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 baseline and monitoring methodology applicable to this project is ACM0002: Grid-connected electricity generation from renewable sources --- Version 20.0¹⁶ was applied for the project activity. ACM0002 refers to the following tools:

- “Tool for the demonstration and assessment of additionality”, Version 06.0, and,
- “Tool to calculate the emission factor for an electricity system”, Version 02.2.1.
- “Assessment of the validity of the original/current baseline and update of the baseline at the renewal of the crediting period”, Version 03.0.1
- Tool 07, “Tool to calculate the emission factor for an electricity system”, Version 07.0¹⁷

B.2. Applicability of methodology (ies)

The choice of methodology ACM0002, is justified as the project activity meets its applicability criteria. Cemel Hydro Power Plant is a large-scale hydro power type, greenfield, grid connected renewable electricity generation project.

¹⁶ <https://cdm.unfccc.int/methodologies/DB/XP2LKUSA61DKUQC0PIWPGWDN8ED5PG>

¹⁷ <https://cdm.unfccc.int/methodologies/PAmethodologies/tools/am-tool-07-v7.0.pdf>

No.	Applicability Conditions	The Project
1	This methodology is applicable to grid-connected renewable energy power generation project activities that: (a) Install a Greenfield power plant; (b) Involve a capacity addition to (an) existing plant(s); (c) Involve a retrofit of (an) existing operating plants/units; (d) Involve a rehabilitation of (an) existing plant(s)/unit(s); or (e) Involve a replacement of (an) existing plant(s)/unit(s).	Cemel Hydro Power Plant is a large-scale hydro power type, greenfield, grid connected renewable electricity generation project. So, the project meets (a) Install a Greenfield power plant.
2	The project activity may include renewable energy power plant/unit of one of the following types: hydro power plant/unit with or without reservoir, wind power plant/unit, geothermal power plant/unit, solar power plant/unit, wave power plant/unit or tidal power plant/unit.	The project activity is installation of a new grid connected renewable energy power plant of the type hydro power plant.
3	In the case of capacity additions, retrofits, rehabilitations or replacements (except for wind, solar, wave or tidal power capacity addition projects) the existing plant/unit started commercial operation prior to the start of a minimum historical reference period of five years, used for the calculation of baseline emissions and defined in the baseline emission section, and no capacity expansion, retrofit, or rehabilitation of the plant/unit has been undertaken between the start of this minimum historical reference period and the implementation of the project activity.	The project does not involve a capacity addition to an existing plant, a retrofit of an existing operating plant, a rehabilitation of an existing plant, a replacement of an existing plant. Hence, this condition is N/A.
4	In case of hydro power plants, one of the following conditions shall apply: (a) The project activity is implemented in existing single or multiple reservoirs, with no change in the volume of any of the reservoirs; or (b) The project activity is implemented in existing single or multiple reservoirs, where the volume of the reservoir(s) is increased and the power density, calculated using equation (7), is greater than 4 W/m²; or (c) The project activity results in new single or multiple reservoirs and the power density, calculated using equation (7), is greater than 4 W/m²; or (d) The project activity is an integrated hydro power project involving multiple reservoirs, where the power density for any of the reservoirs, calculated using equation (7), is lower than or equal to 4 W/m², all of the following conditions shall apply: (i) The power density calculated using the total installed capacity of the integrated project, as per equation (8), is greater than 4 W/m²; (ii) Water flow between reservoirs is not used by any other hydropower unit which is not a part	The project is a hydro power plant. (c) The project activity results in new single or multiple reservoirs and the power density, calculated using equation (7), is greater than 4 W/m².

	of the project activity; (iii) Installed capacity of the power plant(s) with power density lower than or equal to 4 W/m² shall be: a. Lower than or equal to 15 MW; and b. Less than 10 per cent of the total installed capacity of integrated hydro power project.	
5	In the case of integrated hydro power projects, project proponent shall: (a) Demonstrate that water flow from upstream power plants/units spill directly to the downstream reservoir and that collectively constitute to the generation capacity of the integrated hydro power project; or (b) Provide an analysis of the water balance covering the water fed to power units, with all possible combinations of reservoirs and without the construction of reservoirs. The purpose of water balance is to demonstrate the requirement of specific combination of reservoirs constructed under CDM project activity for the optimization of power output. This demonstration has to be carried out in the specific scenario of water availability in different seasons to optimize the water flow at the inlet of power units. Therefore, this water balance will take into account seasonal flows from river, tributaries (if any), and rainfall for minimum of five years prior to the implementation of the CDM project activity.	The project is not a integrated hydro power project. Hence, this condition is N/A.
6	The methodology is not applicable to: (a) Project activities that involve switching from fossil fuels to renewable energy sources at the site of the project activity, since in this case the baseline may be the continued use of fossil fuels at the site; (b) Biomass fired power plants/units.	-The project does not involve switching from fossil fuel use to renewable energy at the site of the project activity. -The project is not a biomass fired power plant.
7	In the case of retrofits, rehabilitations, replacements, or capacity additions, this methodology is only applicable if the most plausible baseline scenario, as a result of the identification of baseline scenario, is "the continuation of the current situation, that is to use the power generation equipment that was already in use prior to the implementation of the project activity and undertaking business as usual maintenance".	The project does not involve retrofits, rehabilitations, replacements or capacity additions. Hence, this condition is N/A.

8	In addition, the applicability conditions included in the tools referred to below apply. ¹⁸	Given below.
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Applicability as per “Tool 07 : Tool to calculate the emission factor for an electricity system, version 07.0”

No.	Applicability Conditions	The Project
1	This tool may be applied to estimate the OM, BM and/or CM when calculating baseline emissions for a project activity that substitutes grid electricity that is where a project activity supplies electricity to a grid or a project activity that results in savings of electricity that would have been provided by the grid (e.g. demand-side energy efficiency projects).	The project activity supplies electricity to a grid. Hence, this condition is met.
2	Under this tool, the emission factor for the project electricity system can be calculated either for grid power plants only or, as an option, can include off-grid power plants. In the latter case, two sub-options under the step 2 of the tool are available to the project participants, i.e. option IIa and option IIb. If option IIa is chosen, the conditions specified in “Appendix 1: Procedures related to off-grid power generation” should be met. Namely, the total capacity of off-grid power plants (in MW) should be at least 10 per cent of the total capacity of grid power plants in the electricity system; or the total electricity generation by off-grid power plants (in MWh) should be at least 10 per cent of the total electricity generation by grid power plants in the electricity system; and that factors which negatively affect the reliability and stability of the grid are primarily due to constraints in generation and not to other aspects such as transmission capacity.	CO ₂ emission factor for the displacement of electricity generated by power plants in an electricity system is determined by calculating the “combined margin” emission factor (CM) of the electricity system.

¹⁸ The condition in “TOOL02: Combined tool to identify the baseline scenario and demonstrate additionality” that all potential alternative scenarios to the proposed project activity must be available options to project participants; does not apply to this methodology, as this methodology only refers to some steps of this tool.

3	In case of CDM projects the tool is not applicable if the project electricity system is located partially or totally in an Annex I country.	The project electricity system is not located partially or totally in an Annex I country. Hence, this condition is N/A.
4	Under this tool, the value applied to the CO ₂ emission factor of biofuels is zero.	The project does not involve biofuels in any way.

Applicability as per “Tool 01 : Tool for the demonstration and assessment of additionality, version 07.0.0”

No.	Applicability Conditions	The Project
1	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.	Tool for the demonstration and assessment of additionality is applied in this project since there is no new methodologies proposed. Hence, this condition is N/A.
2	Once the additionally tool is included in an approved methodology, its application by project participants using this methodology is mandatory.	The additionality tool is applied using this methodology.

Applicability as per “Tool 24 : Common practice, version 03.1”

No.	Applicability Conditions	The Project
1	This methodological tool is applicable to project activities that apply the methodological tool “Tool for the demonstration and assessment of additionality”, the methodological tool “Combined tool to identify the baseline scenario and demonstrate additionality”, or baseline and monitoring methodologies that use the common practice test for the demonstration of additionality	This project activity applies the methodological tool “Tool for the demonstration and assessment of additionality”. Hence, this condition is met.

2	In case the applied approved baseline and monitoring methodology defines approaches for the conduction of the common practice test that are different from those described in this methodological tool, the requirements contained in the methodology shall prevail.	Common practice analysis is provided in section B.5.
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Applicability as per “Tool 27 : Investment Analysis, version 11.0”

No.	Applicability Conditions	The Project
1	This methodological tool is applicable to project activities that apply the methodological tool “Tool for the demonstration and assessment of additionality”, the methodological tool “Combined tool to identify the baseline scenario and demonstrate additionality”, the guidelines “Non-binding best practice examples to demonstrate additionality for SSC project activities”, or baseline and monitoring methodologies that use the investment analysis for the demonstration of additionality and/or the identification of the baseline scenario.	This project activity applies the methodological tool “Tool for the demonstration and assessment of additionality”. Hence, this condition is met.
2	In case the applied approved baseline and monitoring methodology contains requirements for the investment analysis that are different from those described in this methodological tool, the requirements contained in the methodology shall prevail.	Investment practice analysis is provided in section B.5.

Since there is no delineation of project electricity system or connected electricity systems by DNA, following criteria has been used to determine the existence of significant transmission constraints:

- In case of electricity systems with spot markets for electricity: there are differences in electricity prices (without transmission and distribution costs) of more than 5 per cent between the systems during 60 per cent or more of the hours of the year.
- The transmission line is operated at 90% or more of its rated capacity during 90% per cent or more of the hours of the year.

Since the project output is fed to the Turkish electricity grid which does not involve any distinct electricity systems that applies different price, first criteria defined above is not applicable. Also, since the transmission line between the proposed projects and nearest substation is built within the scope of the project and there exist no information on grid capacity utilization, second criteria is also inapplicable. Based on assessment above, it is difficult to conclude with a significant transmission constraint or grid boundary. Since there is no dispatch grid system in Turkey, the project boundary is considered as the National Electricity Grid of Turkey according to applied tool. The geographical and physical boundaries of the Turkish grid and location of the power plants are well identified as given diagram below.

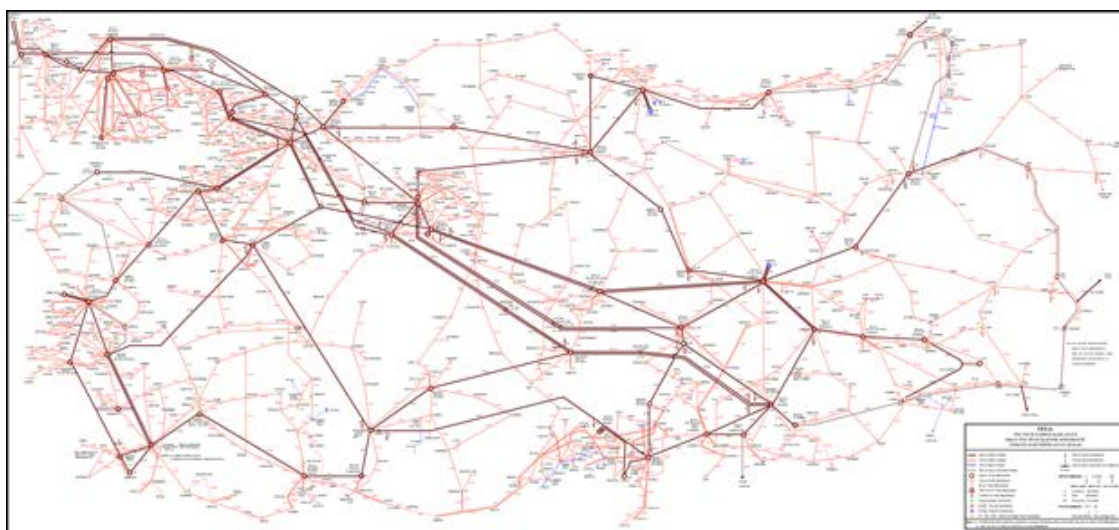


Figure 2. Turkish electricity grid

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
		CO ₂	No	Minor emission source. Excluded for simplification as per the applied methodology

Emissions of CH ₄ from the reservoir CO ₂ 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 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. The flow diagram of the project boundary is illustrated below:

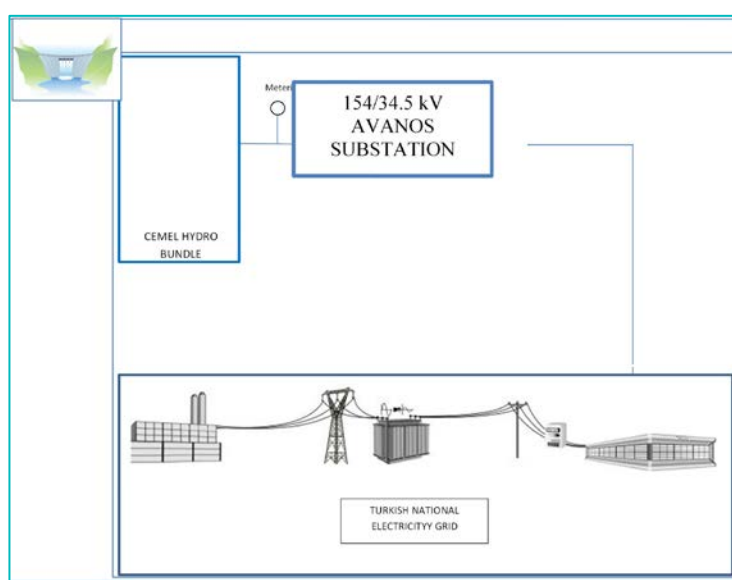


Figure 3. Project boundary

B.4. Establishment and description of baseline scenario

According to the methodology (ACM0002: Grid-connected electricity generation from renewable sources, v.20) 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” as per Section 5.2.2, paragraph 23, of the selected methodology¹⁹.

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:

No.	Applicability Conditions	The Project
Step 1.1	If the current baseline complies with all relevant mandatory national and/or sectoral policies which have come into effect after the submission of the project activity for validation or the submission of the previous request for renewal of the crediting period and are applicable at the time of requesting renewal of the crediting period, go to Step 1.2. If the current baseline does not comply with relevant mandatory national and/or sectoral policies, then assess based on the examination of current practice in the country or region in which the policies apply, whether those policies are systematically not enforced and that non-compliance with those requirements is widespread in the country or region.	There is no change in national/sectoral policies affecting project implementation. Hence the Step 1.2. can be evaluated.
Step 1.2.	Assess the impact of circumstances existing at the time of requesting renewal of the crediting period on the current baseline emissions, without reassessing the baseline scenario. In the situation where the baseline scenario identified at the validation of the project activity was the continuation of the current practice without any investment, an assessment of the changes in market characteristics is required for the renewal of the crediting period. Evaluate whether the conditions used to determine the baseline	The combined margin is updated as per OM & BM calculations by Ministry of Energy and Resources ²⁰

¹⁹ <https://cdm.unfccc.int/methodologies/DB/XP2LKUSA61DKUQC0PIWPGWDN8ED5PG>

²⁰

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

	emissions in the previous crediting period are still valid. Assess the availability of new fuels or raw materials and the impact of electricity or fuel prices in the identification of the current practice for the baseline emissions.	
Step 1.3	This sub-step should only be applied if the baseline scenario identified at the validation of the project activity was the continuation of use of the current equipment(s) without any investment and, the projects proponents or third party (or parties) would undertake an investment later due, for example, to the end of the technical lifetime of the equipment(s) before the end of the crediting period or the availability of a new technology. Assess whether the remaining technical lifetime of the equipment that would have continued to be used in the absence of the project activity, as determined in the CDM-PDD or CDM-PDD-REN, exceeds the crediting period for which renewal is requested. Take into consideration the market penetration of different technologies. Evaluate the penetration rate of different technologies that are available in the market and evaluate how they could affect the baseline.	There is no overdue technology in the project as the lifetime of the technologies used was defined as 20 years as equity IRR has been calculated for the validation period ²¹ . the ongoing financial need derived from GS is still valid considering that the financial model validated in first crediting period projects 20 years of operation of the project. Hence, the model is still valid for the current crediting period.
Step 1.4	Assess whether data and parameters that were only determined at the start of the crediting period and not monitored during the crediting period are still valid or whether they should be updated. Updates should be undertaken in the following cases: Where IPCC default values are used, the values should be updated if any new default values have been adopted and published by the IPCC, for example, in guidelines for national GHG inventories, IPCC assessment report or special reports by the IPCC;	The combined margin is updated as per OM & BM calculations by Ministry of Energy and Resources. Hence the assessment should proceed to Step 2.

²¹ Validation Report Ver 02

	Where emission factors, values or emission benchmarks are used and determined only once for the crediting period, they should be updated, except if the emission factors, values, or emission benchmarks are based on the historical situation at the site of the project activity prior to the implementation of the project and cannot be updated because the historical situation does not exist anymore as a result of the CDM project activity. <i>If the application of Steps 1.1, 1.2, 1.3 and 1.4 confirmed that the current baseline as well as data and parameters are still valid for the subsequent crediting period, then this baseline, data and parameters can be used for the renewed crediting period. Otherwise, proceed to Step 2.</i>	
Step 2	Update the current baseline and the data parameters.	The data and the parameters are updated for the second crediting period.

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. Since Turkey is a developing country, there is an increasing demand for electricity which is fully expected to continue in the foreseeable future.

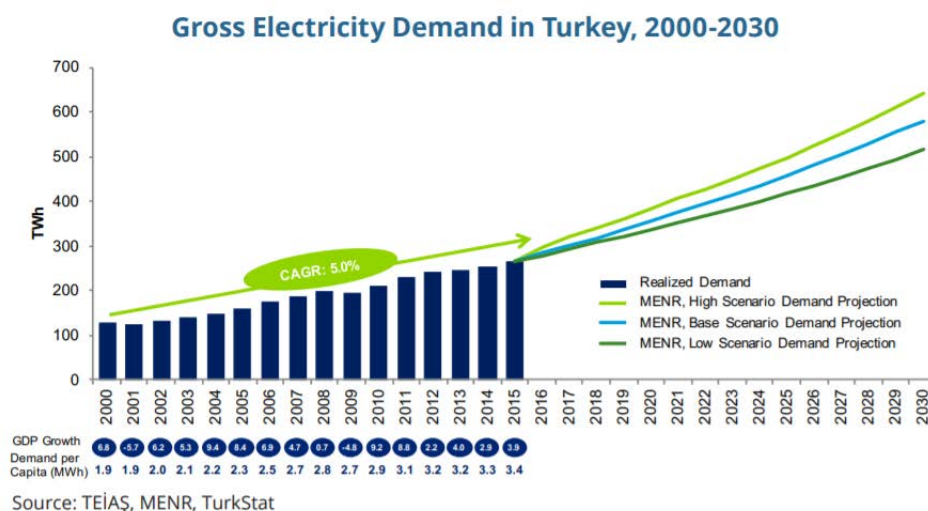


Figure 4. Projection of Turkey's electricity demand²²

Keeping in mind the slow development of alternative energy sources, the trend in Turkey is to build new thermal power plants to satisfy the annual growth in energy demand. Turkey as a developing nation has been dealing with energy security by developing and constructing high capacity coal and natural gas power plants (Figure 5). The development of thermal power plants has also been encouraged by the large natural resource availability, especially the abundance of economically accessible lignite (Figure 6).

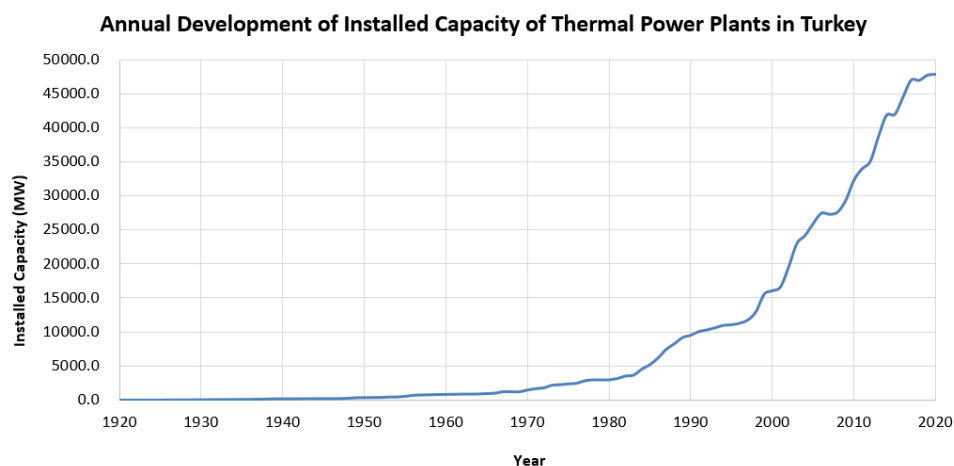


Figure 5. Development of Turkey's Installed Capacity²³

²² <https://www.dunyaenerji.org.tr/wp-content/uploads/2017/10/turkish-energy-market-outlook.pdf>

²³ <https://webapi.teias.gov.tr/file/6871efed-aea5-4ec1-bf65-26d70e4f67e9?download>

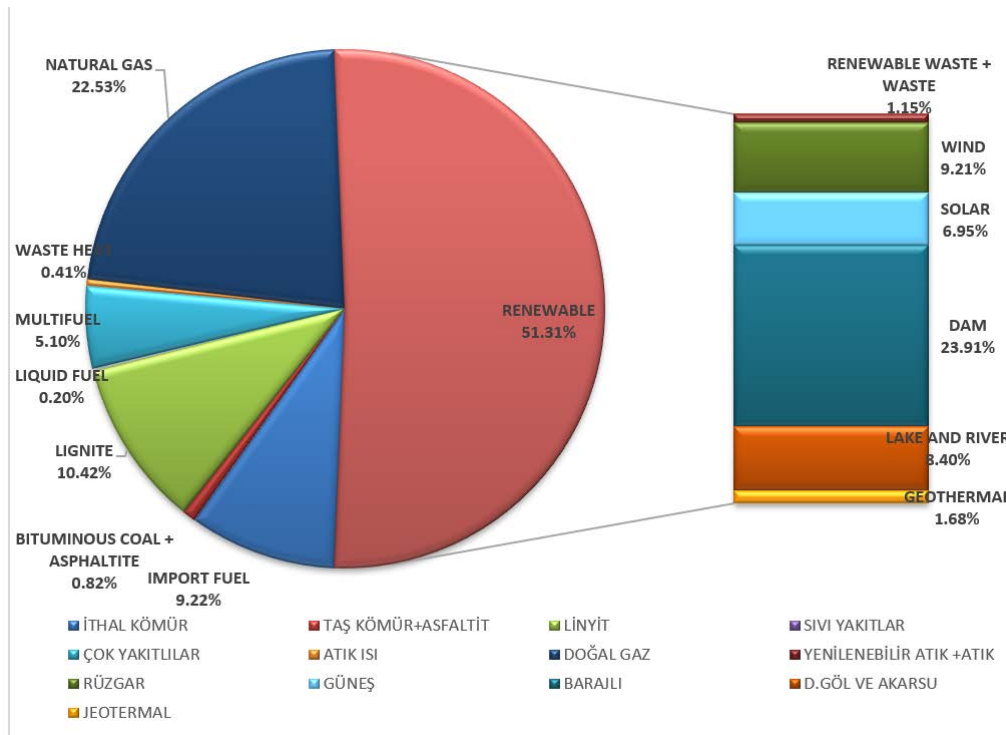


Figure 6. Distribution of installed capacity by primary energy resources²⁴

In the absence of the proposed project activity, the same amount of electricity would be required to be supplied by either the current power plants or the new thermal power plants which would lead to increasing GHG emissions.

According to the TEIAS statistics²⁵, share of HEPPs in total installed capacity of Turkey is about 32% whereas share of HEPPs in total generation is only 24.5%²⁶. However, when the historical data is examined, it is observed that total installed capacity of thermal power plants has shown a rapid growth in parallel with the demand for electricity whereas hydroelectric power generation has grown at a much slower rate -

²⁴ <https://webapi.teias.gov.tr/file/39abb292-4b3e-4e70-9e08-914d0ba9bd43?download>

²⁵

[http://www.teias.gov.tr/T%C3%BCrkiyeElektrik%C4%B0statistikleri/istatistik2010/front%20page%202010%C3%A7i%C3%A7ek%20kitap/kguc\(1-12\)/3.xls](http://www.teias.gov.tr/T%C3%BCrkiyeElektrik%C4%B0statistikleri/istatistik2010/front%20page%202010%C3%A7i%C3%A7ek%20kitap/kguc(1-12)/3.xls)

²⁶

[http://www.teias.gov.tr/T%C3%BCrkiyeElektrik%C4%B0statistikleri/istatistik2010/front%20page%202010%C3%A7i%C3%A7ek%20kitap/uretim%20tuketim\(22-45\)/23.xls](http://www.teias.gov.tr/T%C3%BCrkiyeElektrik%C4%B0statistikleri/istatistik2010/front%20page%202010%C3%A7i%C3%A7ek%20kitap/uretim%20tuketim(22-45)/23.xls)

the energy generation proportion decreasing from 40% historically to current levels as shown in the figure below^{27, 28}.

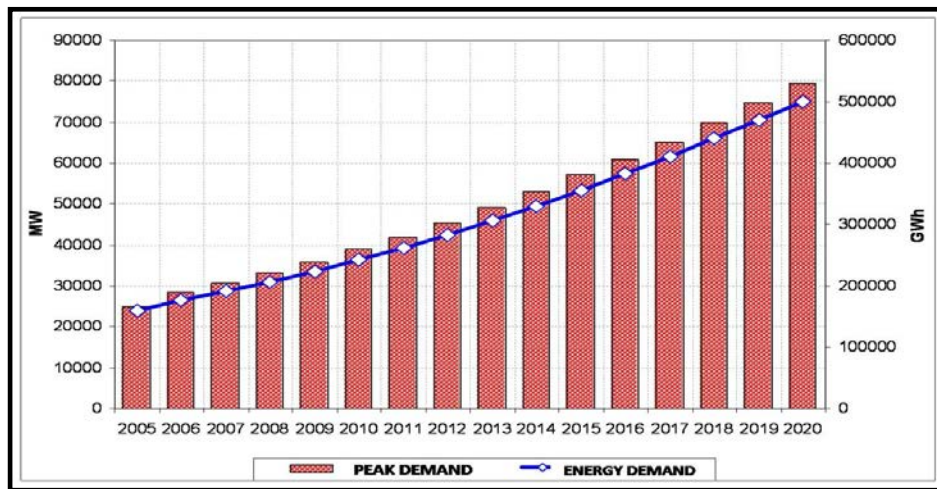


Figure 4. Peak load and consumption projection for Turkish electricity system between 2005-2020^{29, 30}

B.5. Demonstration of additionality

Selected methodology: The UNFCCC approved baseline and monitoring methodology applicable to this project is ACM0002: Grid-connected electricity generation from renewable sources --- Version 20.0³¹ was applied for the project activity. ACM0002 refers to the following tools:

- “Tool 07 Tool to calculate the emission factor for an electricity system: This tool is applicable and used for the calculation of OM, CM and CM since the project activity includes grid power plants and supplies electricity to the grid

²⁷ <https://webim.teias.gov.tr/file/39abb292-4b3e-4e70-9e08-914d0ba9bd43?download>

²⁸ IEA Turkey Country Report, 2005

²⁹ <http://www.teias.gov.tr/apkuretimplani/veriler.htm>

³⁰ https://www.emo.org.tr/genel/bizden_detay.php?kod=51061&tipi=41&sube=0

³¹ <https://cdm.unfccc.int/methodologies/DB/XP2LKUSA61DKUQC0PIWPGWDN8ED5PG>

Emission factor for the baseline scenario which was calculated by the Ministry of Environment and Urbanization has been used.

Within this framework, the project is expected to generate about 73,950 MWh electricity and reduce about 36,451 tCO₂ emissions through replacing the electricity that would need to be supplied via the national grid in the absence of the project activity.

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.

Registered additionality figures that were demonstrated during the design certification is provided below.

Table 5. Main financial parameters used for investment analysis (Figures in brackets show the values at time of investment decision and before project revision)

Parameters	Unit	Data Value
Installed Capacity	MWe	20.4
Grid Connected output	MWh	73.95
Capital Investment (ex-VAT)	Million \$	51.9
Income tax rate	%	20
Expected Tariff	\$ Cents/kWh	7.3
Expected VERs price	\$/tons CO ₂ e	8.0
Operation&Maintenance Cost	\$/year	1,152
Equity	%	100

As per the registered PDD, Equity IRR has been calculated according to the tool as stated in the applied methodology. Investment decision date has been identified as the date of construction agreement (13/07/2011). Calculation and estimations have been made conservatively therefore equity IRR value represented the most optimistic scenario in terms of capital investment and electricity generation. On the other hand electricity tariff was expected to increase so that the investment becomes attractive however, expectations have not been realized yet due to the market conditions.

Expected return on investment for these types of projects should be above 15% as per WB document however, expectation of many investors is higher. Even if we consider

the minimum benchmark equity IRR which is 15%, for proposed project, in order to reach this IRR values, average electricity tariff must be above 11 \$c/kWh in the absence of carbon revenue and assuming that initial investment figures are realized so that the investment will become reasonable.

Equity IRR of the project has been calculated as 7.63% with these parameters which is still below the benchmark. When we include the carbon revenue in the cash flow, equity IRR increases to 8.33% 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 the premium. Carbon revenue has a significant affect in this respect in terms of decreasing the period for return on investment and risk of investment decision.

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 11\$ c/kWh so that the investment will become reasonable. Considering that control of run-of-river hydroelectric power plants on 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.

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

- Construction Cost
- Electromechanical Equipment Cost
- Electricity Income

For a range of $\pm 15\%$ fluctuations in parameters construction and EM equipment cost which $\pm 30\%$ fluctuation in electricity income, table below has been obtained. Parameters have been selected as per the Guidelines on Investment analysis which are

defined as construction and EM equipment costs (54 % and 30 of initial investment respectively).

Table 6. Sensitivity analysis for Cemel HEPP bundle project without carbon revenue

Fluctuation	-15	-10	-5	0	5	10	15
Construction Cost	10.22	9.25	8.39	7.63	6.93	6.31	5.74
EM Works	8.39	8.13	7.88	7.63	7.38	7.13	6.89
Fluctuation	-30	-20	-10	0	10	20	30
Electricity Income	4.11	5.35	6.51	7.63	8.17	9.77	10.82

Sensitivity analysis has been carried out according to the conditions when the investment decision is given hence for 73.95 GWh generation and 7.3\$ c/kWh guaranteed price.

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.

During the first crediting period, the following GS VERs has been issued in the monitoring periods as follows³³:

1st monitoring period:

Jul 01, 2015 — Feb 28, 2017 – 15,465 GS VERs (issued)

Jul 01, 2015 — Feb 28, 2017 – 38,665 GS VERs (issued)

Jul 01, 2015 — Feb 28, 2017 – 7,806 GS VERs (issued)

2nd Monitoring Period:

Mar 01, 2017 — May 31, 2019 – 33,620 GS VERs (issued)

Mar 01, 2017 — May 31, 2019 – 24,684 GS VERs (issued)

Mar 01, 2017 — May 31, 2019 – 9,183 GS VERs (issued)

3rd Monitoring Period:

Jun 01, 2019 — May 31, 2021 – 15,545 GS VERs (issued)

³³ <https://registry.goldstandard.org/projects/details/130>

Jun 01, 2019 — May 31, 2021 – 37,355 GS VERs (issued)

Jun 01, 2019 — May 31, 2021 – 14,057 GS VERs (issued)

The ongoing financial need derived from GS certification is necessary to reduce unattractiveness of the project and enhance the project's operation in the second crediting period. As stated above, the ongoing financial need derived from GS is still valid considering that the financial model validated in first crediting period projects 20 years of operation of the project. Hence, the model is still valid for the current crediting period. This GS finance helps to maintain project activity contributing to the development of local communities in terms of income and employment creation, worker quality increase and emission reductions.

B.5.1 Prior Consideration

This is the second crediting period. The project has no design changes.

B.5.2 Ongoing Financial Need

Expected annual generation as per the generation license is 73,950 MWh. In terms of contribution of carbon revenues, around 196K GS-VER has been issued by November 2022. 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 the following years.

During the first crediting period, the following VERs has been issued in the monitoring periods as follows³⁵:

1st monitoring period:

Jul 01, 2015 — Feb 28, 2017 – 15,465 GS VERs (issued)

Jul 01, 2015 — Feb 28, 2017 – 38,665 GS VERs (issued)

Jul 01, 2015 — Feb 28, 2017 – 7,806 GS VERs (issued)

2nd Monitoring Period:

³⁵ <https://registry.goldstandard.org/projects/details/130>

Mar 01, 2017 — May 31, 2019 – 33,620 GS VERs (issued)

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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."	7.2.1: "Renewable energy share in the total final energy consumption"
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" 8.8: "Protect labour rights and promote safe and secure working environments for all workers, including migrant workers, in particular women migrants, and those in precarious employment"	Contribute to decent work and economic growth by providing long term job opportunities.

9 Industry, Innovation and Infrastructure	9.1: "Develop quality, reliable, sustainable and resilient infrastructure, including regional and transborder infrastructure, to support economic development and human well-being, with a focus on affordable and equitable access for all"	The project promotes quality, reliable, sustainable and resilient infrastructure for energy generation in Turkey, where energy demand is continuously increasing. Therefore, project presents clean and reliable energy source accessible for all.
13 Climate Action	13.3: "Improve education, awareness-raising and human and institutional capacity on climate change mitigation, adaptation, impact reduction and early warning"	Reduce CO ₂ emissions caused by fossil fuel-fired power plants that are displaced due to the project activity.

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:

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

Where:

EGPJ_{y,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 73,950 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 factor has been used.³⁶)

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 0.7258.

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

$$BE_y = 73,950 \text{ MWh} \times 0.4929 \text{ tCO}_2\text{e}/\text{MWh} = 36,451 \text{ tCO}_2\text{e}$$

Project emissions

The project activity involves the generation of electricity by a hydroelectric power plant which does not cause any significant effect on a new reservoir other than the existing river bed. Since the project does not cause any new flooded area or reservoir formation, the power density of the project activity (PD) has not been calculated.

According to ACM0002 v20.0 para 5 “(a) *The project activity is implemented in existing single or multiple reservoirs, with no change in the volume of any of the reservoirs*” Therefore, the project activity has no project emissions regarding power density, and this is demonstrated below.

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)

³⁶ <https://www.greensolarnetwork.org/assets/attachments/dosyalar/Elektrik-%C5%9Eebekesi-Emisyon-Fakt%C3%B6r%C3%BC.pdf>

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

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

$$PD = \frac{20,400,000 - 0}{0 - 0} = \infty$$

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”, according to para 53 of ACM0002 v20.0.

$$LE_y = 0$$

As a result: Total Emission Reduction is;

$$ER_y = BE_y$$

So, final emission reduction value is 36,451 tCO₂/year, and 218,706 tCO₂ for the whole crediting period of 7 years.

B.6.2 Data and parameters fixed ex ante

SDG13

Data/parameter	EF _{grid,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 ³⁷ , OM & BM values ³⁸
Value(s) applied	$CM = (BM \times 0.75) + (OM \times 0.25)$ As given by the Ministry of Energy and Natural Resources, built margin is 0.4153 and operating margin is 0.7258. $(0.4153 \times 0.75) + (0.7258 \times 0.25) = 0.4929 \text{ tCO}_2/\text{MWh}$
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 73,950 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 around 28 employment opportunities. It contributes to decent work and economic growth by providing long term job opportunities.

³⁷ Under “Türkiye Ulusal Elektrik Şebekesi Emisyon Faktörü Bilgi Formu” in this weblink: <https://enerji.gov.tr/evced-cevre-ve-iklim-turkiye-ulusal-elektrik-sebekesi-emisyon-faktoru>

³⁸ <https://www.greensolarnetwork.org/assets/attachments/dosyalar/Elektrik-%C5%9Eebekesi-Emisyon-Fakt%C3%B6r%C3%BC.pdf>

SDG 13: 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 36,451 tCO₂ per annum.

SDG 9 : Industry, Innovation and Infrastructure (Build resilient infrastructure, promote inclusive and sustainable industrialization and foster innovation)

The hydropower plant project is an innovative built infrastructure which is reliable, sustainable and resilient which provides sustainable electricity generation, therefore, supports economic development. The project provides infrastructural benefits for all.

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 (01/07/2022 - 31/12/2022)	18,375.30	0.00	18,375.30
2023	36,451.00	0.00	36,451.00
2024	36,451.00	0.00	36,451.00
2025	36,451.00	0.00	36,451.00
2026	36,451.00	0.00	36,451.00
2027	36,451.00	0.00	36,451.00
2028	36,451.00	0.00	36,451.00
2029 (01/01/2029 - 30/06/2029)	18,075.70	0.00	18,075.70
Total	255,157	0	255,157
Total number of crediting years	7 years		

Annual average over the crediting period	36,451	0	36,451
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SDG 7

Year	Baseline estimate (MWh)	Project estimate (MWh)	Net benefit (MWh)
2022 (01/07/2022 - 31/12/2022)	0	37,278.90	37,278.90
2023	0	73,950.00	73,950.00
2024	0	73,950.00	73,950.00
2025	0	73,950.00	73,950.00
2026	0	73,950.00	73,950.00
2027	0	73,950.00	73,950.00
2028	0	73,950.00	73,950.00
2029 (01/01/2029 - 30/06/2029)	0	36,671.10	36,671.10
Total	0	517,650	517,650
Total number of crediting years	7 years		
Annual average over the crediting period	0	73,950	73,950

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)
01/08/2022 - 31/07/2029	0	Around 28 people	Around 28 people
Total	0	Around 28 people	Around 28 people

Total number of the crediting years	7 years
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SDG 9

Year	Baseline estimate	Project estimate	Net benefit
01/08/2022 - 31/07/2029	No infrastructure in the baseline.	Continuation of innovative built infrastructure which is reliable, sustainable and resilient which provides sustainable electricity generation.	Continuation of innovative built infrastructure which is reliable, sustainable and resilient which provides sustainable electricity generation.
Total	No infrastructure in the baseline.	Continuation of innovative built infrastructure which is reliable, sustainable and resilient which provides sustainable electricity generation.	Continuation of innovative built infrastructure which is reliable, sustainable and resilient which provides sustainable electricity generation.
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 grid 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 73,950 MWh/year
Measurement methods and procedures	Records from the metering devices used in the power plant were used to calculate the annual generation of energy. EPIAS formerly PMUM, the change happened on 01/09/2015 after EPIAŞ received Market Operating License. Market operations transferred from PMUM to EPIAŞ. ³⁹⁾ records were used as a cross-check both for generation and internal consumption.
Monitoring frequency	Continuous measurement and at least monthly recording
QA/QC procedures	In cases where electricity meters are regulated (e.g. the electricity is supplied to the electric grid), the electricity meter is subject to regular maintenance and testing in accordance with the stipulation of the meter supplier and/or as per the requirements set by the grid operators or national requirements. The calibration of meters, including the frequency of calibration, should be done in accordance with national standards or requirements set by the meter supplier or requirements set by the grid operators. The accuracy class of the meters should be in accordance with the stipulation of the meter supplier and/or as per the requirements set by the grid operators or national requirements. Two calibrated meters 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

³⁹ <https://www.epias.com.tr/en/corporate/history/>

	tests of the metering devices and the associated equipment is done before waiting for the periodical maintenance. The meters should 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 years⁴⁰ The meters are tested to know that they are functioning correctly. If the meters fail a test, they are either calibrated or replaced without waiting for 10 years calibration period to end. Meters are 100% in control of the distribution company and the PP does not and can not do any auditing on these meters. They are unders responsibility of the local distribution company. If a test report is successful, it means that the meters have been functioning correctly up until that testing date.
Purpose of data	To calculate the baseline emission value
Additional comment	SDG 7 - Indicator 7.2.1 – “Renewable energy share in the total final energy consumption” 13.3.2 Number of countries that have communicated the strengthening of institutional, systemic and individual capacity-building to implement adaptation, mitigation and technology transfer, and development actions”

Data / Parameter	Cap _{PJ}
Unit	W

⁴⁰ <http://www.resmigazete.gov.tr/eskiler/2008/08/20080807-3.htm>

Description	Installed capacity of the hydro power plant after the implementation of the project activity
Source of data	Equipment labels at the project site. Latest electricity generation licence and EPDK (EMRA) website.
Value(s) applied	20.4 MWe
Measurement methods and procedures	Checking project documents and equipment labels
Monitoring frequency	Yearly
QA/QC procedures	-
Purpose of data	Ensuring validity of project documentation
Additional comment	7.2.1 “Renewable energy share in the total final energy consumption”. 13.3.2 Number of countries that have communicated the strengthening of institutional, systemic and individual capacity-building to implement adaptation, mitigation and technology transfer, and development actions”

Data / Parameter	A_{PJ}
Unit	m^2
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	0 Since no new reservoir is created as the project is impoundment type HEPP.
Measurement methods and procedures	N/A
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	7.2.1 “Renewable energy share in the total final energy consumption”. 13.3.2 Number of countries that have communicated the strengthening of institutional, systemic and individual capacity-building to implement adaptation, mitigation and technology transfer, and development actions”

SDG 13

Data / Parameter	Air Quality
Unit	tons
Description	Reduction of SO ₂ and NO _x emissions due to implementation of project activity that would otherwise be emitted by thermal power plants
Source of data	Electricity generated by Cemel HEPP and NO _x and SO ₂ emission data from GHG inventory of Turkey will be used as reference in calculation of the emission reduction.
Value(s) applied	Total SO₂ emission related to electricity generation is about 1,488.80 kt for 2020 according to National Inventory of Turkey⁴¹. Considering that electricity generation in 2020 is 306,703.10 GWh⁴², SO₂ emission per MWh is calculated as 4.85 kg/MWh. Total NO_x emission related to electricity generation is about 320.68 kt for 2020 according to National Inventory

⁴¹ <https://unfccc.int/documents/461898> , Table 1s1

⁴² <https://webapi.teias.gov.tr/file/56774b2a-087b-4431-9479-29f1cb5d0d87?download>

	of Turkey ⁴³ . NO _x emission per MWh is calculated as 1.05 kg/MWh.
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. NO _x and SO ₂ emission data from GHG inventory of Turkey will be used as reference in calculation of the emission reduction.
Monitoring frequency	Yearly
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	13.2.1. Number of countries that have communicated the establishment or operationalization of an integrated policy/strategy/plan which increases their ability to adapt to the adverse impacts of climate change, and foster climate resilience and low greenhouse gas emissions development

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	Ministry of Energy and Natural Resources, OM & BM values ⁴⁴
Value(s) applied	CM = (BM x 0.75) + (OM x 0.25)

⁴³ <https://unfccc.int/documents/65690> , Table 1s1

⁴⁴ <https://www.greensolarnetwork.org/assets/attachments/dosyalar/Elektrik-%C5%9Eebekesi-Emisyon-Fakt%C3%B6r%C3%BC.pdf>

	As given by the Ministry of Energy and Natural Resources, built margin is 0.4153 and operating margin is 0.7258. $(0.4153 \times 0.75) + (0.7258 \times 0.25) = 0.4929 \text{ tCO}_2/\text{MWh}$
Measurement methods and procedures	The coefficients are taken as 0.75 and 0.25 for BM and OM, respectively according to the methodology.
Monitoring frequency	Once every monitoring period
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	13.2.1. Number of countries that have communicated the establishment or operationalization of an integrated policy/strategy/plan which increases their ability to adapt to the adverse impacts of climate change, and foster climate resilience and low greenhouse gas emissions development

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	28 people are employed in this monitoring period among which 18 of them are locals. Their social security records (employment documents) are provided by the project owner.
Measurement methods and procedures	-
Monitoring frequency	Annually
QA/QC procedures	-
Purpose of data	To monitor the contribution to SDG 8

Additional comment	-
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Data / Parameter	Quality of Employment
Unit	-
Description	HSE trainings
Source of data	Training attendance list and/or certificates
Value(s) applied	Staff to be trained for health and safety issues
Measurement methods and procedures	Training Records
Monitoring frequency	Annually (Once at the end of each monitoring period)
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
Additional comment	SDG 8: Decent Work and Economic Growth - 8.8 “Protect labour rights and promote safe and secure working environments for all workers, including migrant workers, in particular women migrants, and those in precarious employment”

SDG 9

Data / Parameter	Industry, Innovation and Infrastructure
Unit	-
Description	The project promotes quality, reliable, sustainable and resilient infrastructure for energy generation in Turkey, where energy demand is continuously increasing. Therefore, project presents clean and reliable energy source accessible for all.
Source of data	Power plant project site, equipment, SCADA system
Value(s) applied	The hydropower plant project is an innovative built infrastructure which is reliable, sustainable and resilient which provides sustainable electricity generation, therefore, supports economic development. The project provides infrastructural benefits for all.

Measurement methods and procedures	The continuation of the hydropower plant project will be monitored.
Monitoring frequency	At every verification
QA/QC procedures	-
Purpose of data	To monitor the contribution to SDG 9
Additional comment	SDG 9 : Industry, Innovation and Infrastructure “Build resilient infrastructure, promote inclusive and sustainable industrialization and foster innovation”

Data / Parameter	Water Quality and Quantity
Unit	-
Description	Impact of project activity and waste water comes from management activities
Source of data	Site assessment and interviews with locals
Value(s) applied	Amount of river water used for electricity generation and waste water due to management activities.
Measurement methods and procedures	Since the project is run-off- river type, the water used for the electricity generation is released back to river with in 50 m and at least 1 m depth of water will always be available in weir area. Waste water due to management activities is stored and transferred to municipal waste water channel.
Monitoring frequency	Once after construction completed for the impact of project activity. Annually for wastewater generated.
QA/QC procedures	-
Purpose of data	To monitor the project contribution to Principle 8.1 Impact on Natural Water Patterns/Flows
Additional comment	-

Data / Parameter	Hazardous and Non-hazardous Waste
Unit	-
Description	Impact of project activity and non-hazardous domestic waste generation
Source of data	Waste storage area photographs and domestic waste transfer records if there are any
Value(s) applied	No domestic waste generation in the baseline scenario

Measurement methods and procedures	There might be small amounts of domestic waste generation on site, since there are people who are employed and therefore present at the plant.
Monitoring frequency	Annually
QA/QC procedures	-
Purpose of data	To monitor the project contribution to Principle 9.5 Hazardous and Non-hazardous Waste
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 "Validation/Verification Body" '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 Karbon Sürdürülebilir Enerji Eğitim Danışmanlık ve Ticaret A.Ş.:

Responsible for emission reduction calculations, preparing monitoring report and periodical verification process.

MEDAŞ: MERAM ELEKTRİK DAĞITIM A.Ş (Local distribution company) System use agreement and connection agreement are made by this company. Physical connection and management of electricity meters is under MEDAŞ's responsibility.

Installation of meter and data monitoring are carried out according to the regulations by TEİAŞ. The power generation meter readings will be performed by using the main metering device and the auxiliary metering device for accuracy checks only. Data from metering devices will be recorded by TEİAŞ remote reading computerized systems, that can be retrieved on a monthly basis. This will form the basis for invoicing. In addition to the readings of the main metering device, generation data of the Toros HPP can be cross checked, via the TEİAŞ – EPIAŞ web site (<https://seffaflik.epias.com.tr/transparency/>) which is accessible by a password available to the electricity generation companies. EPIAŞ 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 was made and sealed before the commissioning of the power plant. According to the related regulation on calibration of metering devices. The maintenance and test study on metering devices are done and controlled by TEİAŞ and when there is an inconsistency between two devices (main and spare one). The meters are EMH LZQJ-XC with serial numbers of 4632454 (main meter) and 4632455 (spare meter) with accuracy class of 0.5S.

Table 7. Technical properties of the meters

	Main Meter	Spare Meter
Brand	EMH	EMH
Type	LZQJ-XC	LZQJ-XC
Class	0.5S	0.5S
Serial number	4632454	4632455
Date of calibration	22/08/2014	22/08/2014
Due date of calibration	21/08/2024	21/08/2024

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 13/07/2011, start of construction activities.

C.1.2 Expected operational lifetime of project

The expected operational lifetime of the project is about 44 years 11 months as per the license issued. According to the lifetime of turbines which is estimated as 150,000 hours, lifetime of turbines will be about 41 years if operated at full time. Turbines will be renovated or replaced later. Project will be delivered to government authority at no cost at the end of license period.

C.2. Crediting period of project

C.2.1 Start date of crediting period

Crediting period start date is 01/07/2022 and the total length is 7 years. End date of crediting period is 30/06/2029.

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 8.1 – Fish Passage	Functioning of the fish passage will be monitored via observations. The plant has been operational for a long time and there have not been any problems with it. The fish passage was designed and approved by experts, who

also conducted the “Structural Evaluation Of The Fish Passage Project” in 12/08/2012.

Principle 9.5 – Domestic Waste Management

Waste Management Regulation⁴⁵ will be followed in handling of the domestic wastes. Domestic waste disposal records will be present to monitor.

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.
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

⁴⁵ <https://www.mevzuat.gov.tr/mevzuat?MevzuatNo=20644&MevzuatTur=7&MevzuatTertip=5>

	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.
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

Stakeholder feedback round for proposed project was held on 16/07/2012 at Avanos Municipality Meeting Hall in Avanos District of Nevsehir province. The agenda of the meeting was defined considering the GS requirements. The grievance notebook (logbooks) were placed at secure and easily accessible place, at the muhktars' offices in Yenimahalle Village (Avanos District), Cumhuriyet Village (Sulusaray District) and Alaettin Village (Avanos District), where stakeholders could fill in whenever there was a complaint or request which would be regularly checked by the project manager.

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. The comments received during the first crediting period was taken into account and responded accordingly during both project operation and verification periods. 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, such as tree plantation⁴⁶ around it. 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, 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)	Grievance notebooks are placed at nearby villages' mukhtar's offices in Yenimahalle Village (Avanos District), Cumhuriyet Village (Sulusaray District) and Alaettin Village (Avanos District). They can fill in whenever there is a complaint or a request which is regularly checked by the project manager. Stakeholders are also welcome to directly contact the power plant staff in case they have an input. HGG Enerji Üretim A.Ş. Murat Müftüoğlu muratmuftuoglu@hggenerji.com.tr Tel: +90 384 511 25 66
GS Contact (mandatory)	help@goldstandard.org
Other	

⁴⁶ Photographs have been share with the VVB

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 10/03/1954⁴⁷. 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.

⁴⁷ 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 ⁴⁸	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			

⁴⁸ 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?	a. No b. Not relevant	There was no need for land tenure.	No mitigation is needed 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	Yes	The project does not engage in, contribute to or reinforce corruption of any kind.	Turkey has ratified several conventions on bribery and corruption including OECD and UN conventions. No mitigation measure is required for this indicator.
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. ⁴⁹ 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.

⁴⁹ <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^{50, 51} since 1992 and ratified ILO convention 138 and 182⁵². 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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⁵⁰ <http://www.ilo.org/ipec/programme/lang--en/index.htm>

⁵¹ <http://www.ilo.org/ipec/Regionsandcountries/lang--en/index.htm>

⁵² <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 36,451 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 73,950 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	Project is run-of-river type and it uses the existing water on the river and releases back to river with in 50 m. Since there is no conveyance line, no minimum flow is determined or gauging station is required for the project activity. Also the project is subject to water utilization right agreement dated 05/11/2010. Nearby irrigation facilities or fishing activities will not be affected. As per the “Water Utilization Agreement” between the PP and DSI, all rules are set and	Functionality of the fish passage will be done by observations. According to the letters received from DSI (Devlet Su İşleri – State Hydraulic Works) on 04/04/2013 (1), 29/08/2013 (2) and 10/06/2015 (3), ecological flow monitoring is not required. Therefore, no mitigation measure is required.

		agreed by both parties, dated 05/11/2010. As mentioned in page 1-2 (Point 4) in this agreement <i>“Within the framework of the works carried out by DSI in parallel with the basin development of the region where hydroelectric power generation facilities are located, within the scope of existing, under construction and conceivable projects in the basin, for drinking, utility, tourism and industrial water supply, irrigation, flood protection and energy purposes and for other purposes other than these. Operational plans that will determine the amount and timing of water to be allocated to other</i>	
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		<i>organizations and legal entities are made by DSI and notified to the company. The company is obliged to comply with these plans.” Therefore, mitigation measure is not required as DSI is the responsible and managing party. There also exists a fish passage not to cause negative impact on natural water patterns/flows. The fish passage was designed in line with international standards and approved by experts, who also conducted the “Structural Evaluation Of The Fish Passage Project” in 12/08/2012.</i>	
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?	No	Project does not have any impact on erosion. The main construction activities are powerhouse, weir and fish passage constructions. Excavation aggregate is formed at all three sites and excavated soil is disposed appropriately and used for landscaping.	Project had excavation work on the all three project sites. Since the project sites are near the existing road which is paved already, no significant dust due to vehicles are expected however, to minimize the impact, construction site was irrigated regularly to avoid dust.⁵³ To avoid dust problem in the village, trucks were covered during the transportation of the excavated soil.¹⁴ Also during the storage of the excavated soil, the top layer of the soil
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⁵³ PIF, page 188

			was kept with a %10 humidity ration to avoid the dust problem. Project is subject to a comprehensive dust formation modelling due to cement production. All the necessary procedures were followed and it has been proved that the project dust emissions are below the regulative limit values for particulate matters.
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	Project site is mainly surrounded by agricultural lands which are not affected and will continue to be cultivated after project activity.	No mitigation measure is required for this indicator.
Principle 9.2 Vulnerability to Natural Disaster			
Will the Project be susceptible to or lead to increased vulnerability to wind,	No	Project will not lead to increased vulnerability to hydro, earthquakes,	No mitigation measure is required for this indicator.

earthquakes, subsidence, landslides, erosion, flooding, drought or other extreme climatic conditions?		subsidence, landslides, erosion, flooding, drought or other extreme climatic conditions. All the design and construction works is performed in accordance with relevant regulation (Regulation on Buildings Constructed in Earthquake Zones)	
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.
Principle 9.4 Release of pollutants			
Could the Project potentially result in the release of pollutants to the environment?	Potentially	Project was expected to create solid, liquid and particulate wastes/emissions during its construction. Hazardous wastes were also expected such as waste oils in	Handling, storage and disposal of these wastes were done according to the Turkish regulations.

		the construction and operation period.	
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?	Potentially	Project was expected to create solid, liquid and particulate wastes/emissions during its construction. Hazardous wastes were also expected such as waste oils in the construction and operation period. During operation phase, non-hazardous domestic waste might be generated.	Handling, storage and disposal of these wastes were 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	There is no forest area in and in the close vicinity of the project area.	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			
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?	No	The project does not affect any identified sensitive area and it is not located in a High Conservation Value area. As seen in the Forest Stand Map prepared with the maps obtained from the General Directorate of Forestry with the help of ArcGis 9.2 program, which is one of the Geographical Information System programs; There is no forest area in and around the	No mitigation is needed for this indicator.

		project area⁵⁴. Among the taxa found in the activity area and its surroundings and which are likely to be found due to their habitat characteristics; According to the Annex-1 list of the "Convention on the Protection of European Wildlife and Habitats (Bern Convention)", there is no plant species that should be protected⁵⁵. No change is expected in the amount of natural moisture and on the climate. Therefore, since no climatic changes are expected, no adverse effects are expected on flora, fauna and their habitats⁵⁶.	
Principle 9.11 Endangered Species			

⁵⁴ PIF, page 61

⁵⁵ PIF, page 67

⁵⁶ PIF, page 83

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. Among the taxa found in the activity area and its surroundings and which are likely to be found due to their habitat characteristics; According to the Annex-1 list of the "Convention on the Protection of European Wildlife and Habitats (Bern Convention)", there is no plant species that should be protected⁵⁷. No change is expected in the amount of natural moisture and on the climate. Therefore, since no climatic changes are expected, no adverse effects are expected on flora, fauna and their habitats⁵⁸.	No mitigation is needed for this indicator.
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⁵⁷ PIF, page 67

⁵⁸ PIF, page 83

APPENDIX 2- CONTACT INFORMATION OF PROJECT PARTICIPANTS

Organization name	HGG Enerji Üretim Anonim Şirketi
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