



**Verified Carbon
Standard**

A VERRA STANDARD

AKOCAK HYDROELECTRIC POWER PLANT



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Project ID	535
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1 PROJECT DETAILS

1.1 Summary Description of the Project

AKOCAK is a run of river type hydroelectric power plant (HEPP) project located on Karadere River, in Trabzon province, in East Black Sea Region of Turkey. The purpose of the project is to generate energy from the running waters of Karadere River. The project is close to Erikli, Akocak, and Kayaici villages.

The electricity generation license has been awarded to Çanakçı HES Elektrik Üretim A.Ş. for a period of 38 years 10 months 22 days from the date 01-January-2016 by the Turkish licensing authority named as Energy Market Regulatory Authority (EMRA). The owner of the project has been changed from Akenerji Elektrik Üretim A.Ş to Çanakçı HES Elektrik Üretim A.Ş on 01-January-2016. The generation license was transferred.

The power house includes two turbines of vertical pelton type, each 42.09 MWm/41.25 MWe. The design flow rate is 12.30 m³/sec. Net head is 744 meters. There are two generators, each 48.75 MVA. The installed capacity of Akocak HEPP is 84.18 MWm/82.5 MWe. Project installed capacity has been increased from 82.46 MWm / 81 MWe to 84.18 MWm / 82.5 MWe on 06-November-2017. However, the annual generation which is 257,440 MWh has remained the same. So, there is no need to change the additionality of the project.

The generated electrical energy is connected to Arsin TM and Araklı (Karadere Havza) TM grid substations through a double circuit 2 x 477 MCM, 32 km long 154 kV transmission line. The annual estimated electrical energy generation is 257,440 MWh according to the generation license. Corresponding emission reduction is about 117,598 tCO₂ per year in the second crediting period. Total electricity generation and total emission reduction values for this crediting period are estimated to be 2,574,400 MWh and 1,175,979 tCO_{2e}, respectively.

Table 1. Project Implementation Milestones

Milestone	Date
License Issuance	23-November-2005
EIA Approval	17-October-2006
Equipment Purchase Agreement	05-October-2006
Start of Construction	01-December-2006
License Amendment	17-May-2007

Carbon Agreement	10-June-2008
LSC Meeting	27-October-2008
Provisional Acceptance & Commissioning for Unit 1	29-July-2010
Provisional Acceptance & Commissioning for Unit 2	30-June-2010
First Crediting Period	01-July-2010 – 30-June-2020
License Amendment	24-December-2015
Change of Project Owner	01-January-2016
License Amendment	06-November-2017
Second Crediting Period	01-July-2020 – 30-June-2030

The main goals of the Akocak HEPP project include;

- Using Turkey's hydroelectric potential to meet the increasing demand for electricity and contributing toward the guarantee of Turkey's energy security.
- Increase the share of run of river type HEPPs in the mix of electricity generation in Turkey, reduce dependency on imported fossil fuel and as a consequence provide a tangible reduction in GHG emissions.
- Contribute to economic development by creating direct and indirect job opportunities during the construction and operation phases.

According to the applied methodology ACM0002¹, “the baseline scenario is electricity delivered to the grid by the project activity that would have otherwise been generated by the operation of grid connected power plants and by the addition of new generation sources, as reflected in the combined margin (CM) calculations described in TOOL07.”.

1.2 Audit History

Audit type	Period	Program	Validation/verification body name	Number of years
Validation	01-July-2010 – 30-June-2020	VCS	Bureau Veritas Certification Holding	Ten years

¹ <https://cdm.unfccc.int/UserManagement/FileStorage/R0IJ1X9LQ7W2GOYHSMBFCPE3VKZ685>

	(1 st crediting period)		SAS	
Verification	01-July-2010 – 31-July-2012 (1 st monitoring period of the 1 st CP)	VCS	<i>RINA Services S.p.A (RINA)</i>	<i>Two years and one month</i>
Verification	01-August-2012 – 31-December-2015 (2 nd monitoring period of the 1 st CP)	VCS	<i>RINA Services S.p.A (RINA)</i>	<i>Three years, 4 month, and 30 days</i>
Verification	01-January-2016 – 30-June-2020 (3 rd monitoring period of the 1 st CP)	VCS	<i>RINA Services S.p.A (RINA)</i>	<i>Four years, 5 months, and 29 days</i>
Validation	01-July-2020 – 30-June-2030 (2 nd crediting period)	VCS	<i>Earthood Services Private Limited</i>	<i>Ten years</i>

1.3 Sectoral Scope and Project Type

Sectoral scope²	1
Project activity type	Energy Industries (Renewable/Non-Renewable Sources)

1.4 Project Eligibility

1.4.1 General eligibility

The project activity is included under the scope of the VCS Program and excluded under Table 2.1 of the VCS Standard. However, This is the renewal of crediting period, and it is the second crediting period.

The project is eligible under the scope of VCS therefore the project meets the requirements below.

² Projects, activities, or methodologies may be developed under any of the 16 VCS sectoral scopes: <https://verra.org/programs/verified-carbon-standard/vcs-program-details/#sectoral-scopes>

- Akocak HEPP project is grid-connected renewable power generation project that applies a methodology (ACM0002: Grid-connected electricity generation from renewable sources, v22.0³) eligible under VCS program.
- The implementation of the project activities does not cause the violation of any applicable law.
- The project is a hydro project.

The project hasn't meet the RCP submission deadline as per para 3.9.8 (4) of the VCS Standard v4.7. Hence, the project owner has requested an exemption from the VCS about the submission of the PD for renewal of crediting period. As per the exemption granted on 18-September-2025, the deadline for the submission of the renewal of crediting period has been extended to 31-December-2025. The exemption document is publicly available on Verra Registry, under "VCS Other Documents" section of the project page⁴.

The applied methodology (ACM0002) is eligible under the VCS Program. The project is not a fragmented part of a larger project or activity that would otherwise exceed such limits.

The project helps Turkey to stimulate the commercial application of grid connected renewable energy technologies and markets. The specific benefits of the project are:

- Reduce greenhouse gas emissions in Turkey compared to the business-as-usual scenario,
- Help to stimulate private sector participation in hydro power industry in Turkey,
- Relatively reduce some other pollutants from power generation industry in Turkey, compared to a business-as-usual scenario,
- Help to diminish Turkey's increasing energy deficit,
- Diversify the electricity generation portfolio and reduce dependency on import of other energy sources.

1.4.2 AFOLU project eligibility

This project is not an AFOLU project.

1.4.3 Transfer project eligibility

This project is not a transfer project and CPA seeking registration.

1.5 Project Design

³ <https://cdm.unfccc.int/UserManagement/FileStorage/R0IJ1X9LQ7W2GOYHSMBFCPE3VKZ685>

⁴ <https://registry.verra.org/app/projectDetail/VCS/535>

- ☒ Single location or installation
- ☐ Multiple locations or project activity instances (but not a grouped project)
- ☐ Grouped project

1.5.1 Grouped project design

This is not a grouped project.

1.6 Project Proponent

Organization name	ÇANAKÇI HES ELEKTRİK ÜRETİM A.Ş.
Contact person	Muhammed Hilal YILDIRIM
Title	Plant Manager
Address	Akat Mah. Melodi Sok. İTÜ Konutları Sitesi E-Blok No:4E İç Kapı:1 Beşiktaş - İstanbul - TÜRKİYE
Telephone	+90 212 351 41 51
Email	muhammed.yildirim@canakcihes.com.tr

Organization name	GTE Karbon Sürdürülebilir Enerji Eğt. Dan. ve Tic. A.Ş.
Contact person	M. Kemal Demirkol
Title	Director
Address	Mustafa Kemal Mah. 2111. Sok. No: 5 06530 Cankaya - Ankara - TÜRKİYE
Telephone	+90 312 514 63 63
Email	kemal.demirkol@gte.com.tr

1.7 Other Entities Involved in the Project

None.

1.8 Ownership

The owner of the project has been changed from Akenerji Elektrik Üretim A.Ş to Çanakçı HES Elektrik Üretim A.Ş on 01-January-2016 for the period of 38 years 10 months 22 days as per the generation license of the project activity. It is provided by EMRA (Energy Market Regulatory Authority) to the project owner with a license number of EÜ/5966-7/03401 dated 01-January-2016.

1.9 Project Start Date

Project start date	30-June-2010
Justification	This is the date of the provisional acceptance of the Unit-2.

1.10 Project Crediting Period

Crediting period	☐ Seven years, twice renewable ☐ Ten years, fixed ☒ Other (state the selected crediting period and justify how it conforms with the VCS Program requirements)
Start and end date of first or fixed crediting period	01-July-2010 to 30-June-2020 (1st Crediting Period, both days included) 01-July-2020 to 30-June-2030 (2nd Crediting Period, both days included) The project has been registered under previous VCS Standard of the year 2007⁵. On page 7 of this VCS Standard, it is stated as follows; "A maximum of 10 years which may be renewed at most two times.". In the validation PD, it is stated that the crediting period will be renewed twice.

1.11 Project Scale and Estimated GHG Emission Reductions or Removals

- ☒ < 300,000 tCO₂e/year (project)
- ☐ ≥ 300,000 tCO₂e/year (large project)

⁵ <https://verra.org/wp-content/uploads/VCS-2007.pdf>

Calendar year of crediting period	Estimated GHG emission reductions or removals (tCO ₂ e)
01-July-2020 to 31-December-2020	59,282
01-January-2021 to 31-December-2021	117,598
01-January-2022 to 31-December-2022	117,598
01-January-2023 to 31-December-2023	117,598
01-January-2024 to 31-December-2024	117,598
01-January-2025 to 31-December-2025	117,598
01-January-2026 to 31-December-2026	117,598
01-January-2027 to 31-December-2027	117,598
01-January-2028 to 31-December-2028	117,598
01-January-2029 to 31-December-2029	117,598
01-January-2030 to 30-June-2030	58,315
Total estimated ERRs during the first or fixed crediting period	1,175,979
Total number of years	10 years
Average annual ERRs	117,598

1.12 Description of the Project Activity

The project includes two weirs. The first weir called Erikli weir is built on Alcak Brook, a branch of Karadere, on 1,339 meters riverbed elevation. A sediment pool of 41 meters long and 2.3 meters wide is built along the riverbed. The other weir called Akocak weir is built on Karadere branch of the river, on 1,328-meter riverbed elevation. The sediment pool of Akocak weir is 41 meters long and 4.3 meters wide. The powerhouse is located on Karadere River, at 570 meters riverbed elevation.

The water collected at the Erikli weir is connected with a 3-meter diameter, circular section, derivation tunnel of 3,250 meters long to the upstream of Akocak weir. The Akocak weir shall transmit the collected waters to a surge tank through a 6,150 meters long transmission tunnel of 3 meters' cross section. The

penstock extending from the surge tank to the powerhouse is 1,842 meters long, with an average diameter of 1.82 meters.

The power house includes two turbines of vertical Pelton type, each 42.09 MWm/41.25 MWe.

The specifications of the turbines and generators are given in the table below.

Table 2. Characteristics of the Turbines and Generators

Turbines	
Brand-Manufacturer	Voith Hydro
Type	Vertical Pelton Turbine
Serial Numbers (T1-T2)	19448-19449
H _{rated}	746.16 m
Q _{rated}	6.15 m ³ /s
P _{rated}	42.09 MW
Nominal Speed	750.0 rpm
Runaway Speed	1380.0 rpm
Year of Construction	2008
Average Lifetime of Hydro Turbines	25-50 years ⁶
Current Age of the Turbines	17 years
Generators	
Brand	Voith Siemens
Type	Synchronous Generator 1DH5448-3WE04-Z
Serial Numbers (1-2)	SP06.002425.01- SP06.002425.02
Rated Output	46000 kVA
Rated Voltage	13800 V
Rated Current	1925 A
Power Factor	0.90
Rated Speed	750 rpm
Frequency	50 Hz
Number of Phases	3

The design flow rate is 12.30 m³/sec. Net head is 744 meters. There are two generators, each 48.75 MVA. The installed capacity of Akocak HEPP is 84.18 MWm/82.5 MWe. The generated electrical energy is connected to Arsin TM and Araklı (Karadere Havza) grid substations through a double circuit 2 x 477 MCM, 32 km long 154 kV transmission line.

⁶ <https://citiusresearch.com/reports/Machinery-and-Equipment/hydro-turbines-market-report>

The existing electricity grid in Turkey is an interconnected single entity which to a larger extent fed by fossil fuel fired power plants. Akocak HEPP is a grid connected renewable power generation project which adds electricity capacity from hydro power sources which otherwise would have been generated by the fossil fuel fired power plant.

1.13 Project Location

The Akocak HEPP project is located within the boundaries of Arakli District of Trabzon Province. The nearest settlements to the project site are Erikli, Akocak, and Kayaiçi (known as Gelber) villages. The GPS coordinates of the project is given following figure.

	LONGITUDE	LATITUDE
Erikli Weir	E 39° 57' 5.4"	N 40° 36' 23.8"
Akocak Weir	E 39° 54' 54.9"	N 40° 36' 47.5"
Powerhouse	E 39° 54' 12.9"	N 40° 40' 13"

Figure 1. Project Coordinates

Also the project location represented on the map of Turkey is shown below.



1.14 Conditions Prior to Project Initiation

The project is a renewable energy project, prior the project initiation, there was no other electric power plant installation at the project site.

1.15 Compliance with Laws, Statutes and Other Regulatory Frameworks

It is important to note that there are no local laws and regulations in Turkey because it is not a federal state. The Akocak HEPP is in compliance with relevant national laws and regulations related to the project.

The general scheme of the regulations this kind of facilities in line with, are defined by The Renewable Energy Law and Environmental Law⁷⁸. Project is a renewable energy project and is a hydropower plant, which is in the scope of the Renewable Energy Law. A pre-environmental impact assessment report has been prepared according to the Environmental Law. The project received required Environmental Impact Assessment (EIA) clearances, according to the law. Such laws also include land use regulations, forest use permissions and environmental risk management regulations. The company has had the Pre-Assessment Report, Energy Production License, Provisional Acceptances and System Usage Agreement.

The project follows all required relevant regulations but is not a mandatory project. There is no breach of any legislation, and all required permits are obtained.

1.16 Double Counting and Participation under Other GHG Programs

1.16.1 No Double Issuance

Is the project receiving or seeking credit for reductions and removals from a project activity under another GHG program?

☐ Yes ☒ No

1.16.2 Registration in Other GHG Programs

Has the project registered under any other GHG programs?

☐ Yes ☒ No

Is the project active under the other program?

☐ Yes ☒ No

1.16.3 Projects Rejected by Other GHG Programs

Has the project been rejected by any other GHG programs?

☐ Yes ☒ No

⁷ <https://www.mevzuat.gov.tr/mevzuat?MevzuatNo=5346&MevzuatTur=1&MevzuatTertip=5>

⁸ <https://www.mevzuat.gov.tr/mevzuat?MevzuatNo=2872&MevzuatTur=1&MevzuatTertip=5>

1.17 Double Claiming, Other Forms of Credit, and Scope 3 Emissions

1.17.1 No Double Claiming with Emissions Trading Programs or Binding Emission Limits

Are project reductions and removals or project activities also included in an emissions trading program or binding emission limit? See the *VCS Program Definitions* for definitions of emissions trading program and binding emission limit.

☐ Yes ☒ No

1.17.2 No Double Claiming with Other Forms of Environmental Credit

Has the project activity sought, received, or is planning to receive credit from another GHG-related environmental credit system? See the *VCS Program Definitions* for definition of GHG-related environmental credit system.

☐ Yes ☒ No

1.17.3 Supply Chain (Scope 3) Emissions

Do the project activities specified in Section 1.12 affect the emissions footprint of any product(s) (goods or services) that are part of a supply chain?

☐ Yes ☒ No

Is the project proponent(s) or authorized representative a buyer or seller of the product(s) (goods or services) that are part of a supply chain?

☐ Yes ☒ No

Has the project proponent(s) or authorized representative posted a public statement on their website saying, "Carbon credits may be issued through Verified Carbon Standard project [project ID] for the greenhouse gas emission reductions or removals associated with [project proponent or authorized representative organization name(s)] [name of product(s) whose emissions footprint is changed by the project activities]."

☐ Yes ☒ No

1.18 Sustainable Development Contributions

The project aims to generate electricity by using hydroelectric power to supply the increasing national electricity demand in a cleaner and sustainable manner. It reduces the air pollution caused by the grid-connected power plants which are mostly fossil fuel fired.

The following is a list of the project's contribution to the UN SDG:

- SDG-7 on access to affordable, reliable, and sustainable energy, as the project is not relying on imported fossil fuels. In this crediting period, 257,440 MWh/yr renewable electricity is estimated to be supplied to national grid that supports to increase the renewable energy share in the energy mix.
- SDG-8 decent work and economic growth. As the project is providing a decent and secure work environment. All personnel working at the power plant are receiving regular trainings about occupational health and safety.
- SDG-13 on urgent action to combat climate change, as the project is replacing the fossil fuel based national grid and it is producing emission reductions. In this particular project the power plant is estimated to prevent the total release of 1,175,979 tonnes of tCO₂e into the atmosphere in this crediting period.

1.19 Additional Information Relevant to the Project

1.19.1 Leakage Management

Leakage is neglected according to the UNFCCC tools and methodologies that are used.

1.19.2 Commercially Sensitive Information

There is no commercially sensitive information. Hence, this section is not applicable.

1.19.3 Further Information

There is no further information about project activity. Hence, this section is not applicable.

2 SAFEGUARDS AND STAKEHOLDER ENGAGEMENT

2.1 Stakeholder Engagement and Consultation

2.1.1 Stakeholder Identification

Stakeholder Identification	Before consultation meetings, stakeholders were identified.
Legal or customary tenure/access rights	Expropriation was required during the implementation period. The lands which was occupied by IPs were expropriated before the implementation of the project activity. There were no negative issues arisen.
Stakeholder diversity and changes over time	No changes over time about the stakeholder diversity.
Expected changes in well-being	The project does not have any negative impacts.
Location of stakeholders	Near places to the plant, Erikli, Akocak, and Kayaıçi Villages.
Location of resources	Erikli, Akocak, and Kayaıçi Villages which are close settlements at the project site.

2.1.2 Stakeholder Consultation and Ongoing Communication

Date of stakeholder consultation	27-October-2008
Stakeholder engagement process	The main way of communication between locals and project owner is face-to-face communication. The social relations between them are strong and open. If there is any problem, they can easily reach responsible people and tell their grievances. Addition to that, there is a grievance book in the project site, which is easily accessible by the locals. The grievances and their outcomes are being documented on this logbook.
Consultation outcome	There were no negative comments received. During the last crediting period there were no complaints about or demands from the project.

Ongoing communication	The ongoing communication with stakeholders is achieved with an open communication. Additionally, there is a grievance book in the project site, which is easily accessible by the locals. This logbook is regularly checked by the Project Owner.
Stakeholder input	There were no negative comments received.

2.1.3 Free Prior and Informed Consent

Obtaining consent	In these meetings general information about the construction site, duration of the construction and cost of the project, technical information about the equipment's to be used at the project, the potential environmental impacts and the measures to be taken are presented to the stakeholders.
Outcome of FPIC	There is no outcome for FPIC.

2.1.4 Grievance Redress Procedure

Development process	No grievance has been raised during the last crediting period of this project. The grievance, negative or positive, can be provided by local stakeholders related to operation of the project activity.
Grievance redress procedure	PP will resolve all the grievances during whole crediting period. Project manager is accessible by locals all the time. There is no problem encountered about the project/way of communication so far.

2.1.5 Public Comments

There has been no comment received outside of the public comment period. There is a grievance book in the project site, easily accessible by the locals. There are no comments received on this logbook.

Comments received	Actions taken
No comment received from the stakeholders.	Since there is no comment received from the stakeholders, no actions have been taken.

2.2 Risks to Stakeholders and the Environment

2.2.1 Management Experience

The project owner periodically provides necessary trainings to employees. The trainings include Emergency Plan Information, Emergency Training, Fire Training and Drill, First Aid Training, HES General Training, Risk Assessment Training, Safe Vehicle Usage Training, Work Equipment Safe Use Training, Working at Height Training, and Waste Management Training.

The monitoring system organization chart is shown in Figure 2 below, in which the authority and responsibility of project management are defined.

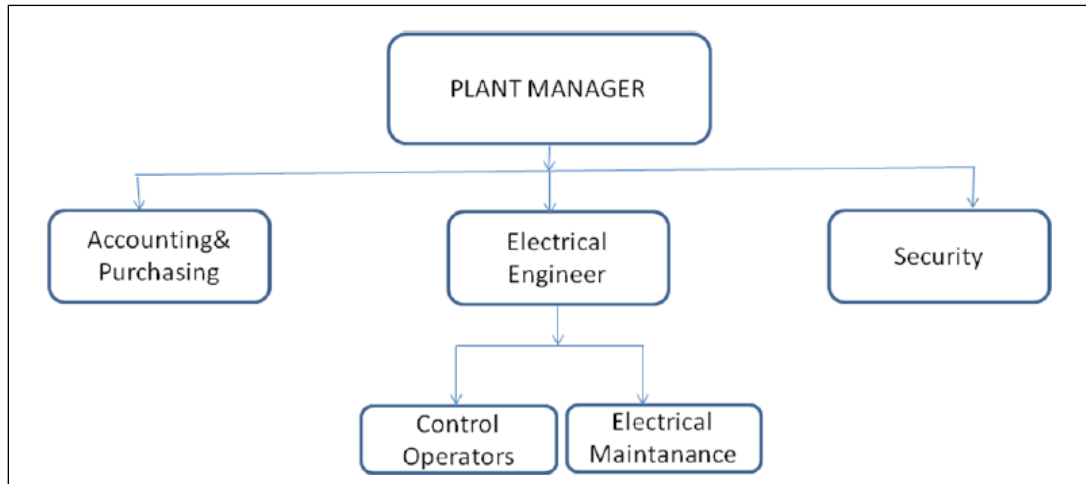


Figure 2. Operational structure of Akocak HEPP

VER Team Members are;

Plant Manager: Overall responsibility of compliance with VER monitoring plan.

Electrical Engineer: Responsible for day to day running of plant, recording and monitoring of relevant data and periodic reporting.

Accounting Manager: Responsible for keeping data about power sales, invoicing and purchasing.

Control Operators & Electrical Maintenance: Staff is responsible for day to day operation and maintenance of the plant and equipment. All staffs were trained and had certificate for working with high voltage equipment.

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

2.2.2 Risk Assessment

Risks identified	Mitigation or preventative measure(s) taken
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Natural and human-induced risks to stakeholders' wellbeing	There is no risk identified for the stakeholder's wellbeing.	Since there are no risk identified, there are no preventative measures taken.
Risks to stakeholder participation	There is no risk identified for the stakeholder participation.	Since there are no risk identified, there are no preventative measures taken.
Working conditions	There is no risk identified for the working conditions.	Even though there is no risk identified, the employees have been given regular trainings about OHS, First Aid, causes of Occupational Accidents and Principles of Prevention, Safety and Health Signs, and The Use of Personal Protective Equipment.
Safety of women and girls	There is no risk identified for the safety of women and girls.	Since there are no risk identified, there are no preventative measures taken.
Safety of minority and marginalized groups, including children	There is no risk identified for the safety of minority and marginalized groups, including children.	Since there are no risk identified, there are no preventative measures taken.
Pollutants (air, noise, discharges to water, generation of waste, and release of hazardous materials and chemical pesticides and fertilizers)	There is no risk identified for any environment (air, water, soil, etc...)	Even though there is no risk identified, there are some measures taken. The hazardous wastes are stored in a protected area on the project site. The disposal of wastes is conducted as per regulations. All the wastes are transferred to a related disposal facility, and the records of this transfer is kept by the Project Owner.

2.3 Respect for Human Rights and Equity

2.3.1 Labor and Work

Risks identified ⁹		Mitigation or preventative measure(s) taken
Discrimination	No risk identified	Türkiye has ratified ILO convention 29, 100, 105, 111, 122, 138, 142, and 182. All the workers are socially secured by the PO and protected by employment agreements.
Sexual harassment	No risk identified	Türkiye has ratified ILO convention 29, 100, 105, 111, 122, 138, 142, and 182. All the workers are socially secured by the PO and protected by employment agreements.
Equal pay for equal work	No risk identified	Türkiye has ratified ILO convention 29, 100, 105, 111, 122, 138, 142, and 182. All the workers are socially secured by the PO and protected by employment agreements.
Gender equity in labor and work	No risk identified	Türkiye has ratified ILO convention 29, 100, 105, 111, 122, 138, 142, and 182. All the workers are socially secured by the PO and protected by employment agreements.
Forced labor	No risk identified	Türkiye has ratified ILO convention 29, 100, 105, 111, 122, 138, 142, and 182. All the workers are socially secured by the PO and protected by employment agreements.
Child labor	No risk identified	Türkiye has ratified ILO convention 29, 100, 105, 111, 122, 138, 142, and 182. All the workers are socially secured by the PO and protected by employment agreements.

⁹ The identified risks and commensurate mitigation or preventative measure(s) for forced labor, child labor, and human trafficking, must be inclusive of staff and contracted workers employed by third parties.

Human trafficking	No risk identified	Türkiye has ratified ILO convention 29, 100, 105, 111, 122, 138, 142, and 182. All the workers are socially secured by the PO and protected by employment agreements.
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2.3.2 Human Rights

The PP recognizes, respects, and promotes the protection of the rights of LCs, and customary rights holders in line with applicable international human rights law. Türkiye has ratified ILO convention¹⁰. PO will never be complicit in violence or human rights abuses. If any complaint is received by the PO, they will act on the issue right away throughout the lifetime of project activity.

Risks identified	Mitigation or preventative measure(s) taken
No risks identified.	-

2.3.3 Indigenous Peoples and Cultural Heritage

There are no lands which was occupied by IPs. This section is not applicable.

Risks identified	Mitigation(s) or preventative measure taken
No risks identified.	-

2.3.4 Property Rights

No expropriation was required during the implementation period. There are no lands which was occupied by IPs. The project site is not a private land. On the contrary it is a government land that classified as forestry area. The property is leased to the project owner by the government until the end of the generation license.

Risks identified	Mitigation(s) or preventative measure taken
No risks identified.	-

¹⁰https://www.ilo.org/wcmsp5/groups/public/---europe/---ro-geneva/---ilo-ankara/documents/genericdocument/wcms_645630.pdf

2.3.5 Benefit Sharing

As explained in Section 2.3.4, the project does not impact property rights. Therefore, this section is not applicable.

Process used to design the benefit sharing plan	NA
Summary of the benefit sharing plan	NA
Approval and dissemination of benefit sharing plan	NA

2.4 Ecosystem Health

	Risks identified	Mitigation or preventative measure(s) taken
Impacts on biodiversity and ecosystems	No risk identified	There are fish passages for them to have not harm due to the project activity. The wastewater, and wastes from the project activity are handled as per the regulations and without giving any harm to the environment.
Soil degradation and soil erosion	No risk identified	Since there are no risk identified, there are no mitigation or preventative measure(s) taken.
Water consumption and stress	No risk identified	The plant uses the water left from the channel to generate electricity, before conveying water to the riverbed. The project partially diverts the Karadere River's water

		flow to a dam to regulate the water flow and convey it to the powerhouse. The project does not consume the water and releases the water to the channel. The minimum flow of the river is being monitored by the DSI (State Hydraulic Works) as AGI records, and it is stated in the EIA report of the project activity.
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2.4.1 Rare, Threatened, and Endangered Species

Is the project located in or adjacent to habitats for rare, threatened, or endangered species?

☐ Yes ☒ No

Since the project is not located in or adjacent to habitats for rare, threatened, or endangered species, this section is not applicable.

2.4.2 Introduction of Species

There are no species introduced. Hence, this section is not applicable

2.4.3 Ecosystem Conversion

The project is not an ARR, ALM, WRC or ACoGS project. Hence, this section is not applicable.

3 APPLICATION OF METHODOLOGY

3.1 Title and Reference of Methodology

Type (methodology, tool or module).	Reference ID, if applicable	Title	Version
Methodology	ACM0002	Consolidated baseline methodology for grid-connected electricity generation from renewable sources	22.0
Tool	TOOL01	Tool for the demonstration and assessment of additionality	07.0.0

Tool	TOOL07	Tool to calculate the emission factor for an electricity system	07.0
Tool	TOOL11	Assessment of the validity of the original/current baseline and update of the baseline at the renewal of the crediting period	03.0.1

3.2 Applicability of Methodology

The ACM0002 (version 22.0.0) methodology is applicable to grid-connected renewable power generation project activities that:

- (a) install a new power plant at a site where no renewable power plant was operated prior to the implementation of the project activity (greenfield plant);
- (b) involve a capacity addition;
- (c) involve a retrofit of (an) existing plant(s); or
- (d) involve areplacement of (an) existing plant(s).

The project activity is suitable for the application of the ACM0002 version 22.0 because it is the installation of a new power plant at a site where no renewable power plant was operated prior to the implementation of the project activity (greenfield plant).

The choice of methodology ACM0002, Version 22.0, is justified as the project activity meets the following applicability criteria:

Methodology ID	Applicability condition	Justification of compliance
ACM0002, v22.0		
5	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	The Akocak HEPP project activity is the installation of a new hydro power plant at a site where no renewable power plant was operated prior to the implementation of the project activity (greenfield plant). Hence, condition (a) is met.

	plant(s)/unit(s); (d) Involve a rehabilitation of (an) existing plant(s)/unit(s); or (e) Involve a replacement of (an) existing plant(s)/unit(s); or (f) Install a Greenfield power plant together with a grid-connected Greenfield pumped storage power plant. The greenfield power plant may be directly connected to the PSP or connected to the PSP through the grid.	
7	In case the project activity involves the integration of a BESS, the methodology is applicable to grid-connected renewable energy power generation project activities that: (a) Integrate BESS with a Greenfield power plant; (b) Integrate a BESS together with implementing a capacity addition to (an) existing solar photovoltaic¹ or wind power plant(s)/unit(s); (c) Integrate a BESS to (an) existing solar photovoltaic or wind power plant(s)/unit(s) without implementing any	This project does not include an integration of a BESS. Hence, this condition is N/A. a) This project does not include an integration of a BESS. Hence, this condition is N/A. b) This project does not include integration a BESS together with implementing a capacity addition to (an) existing solar photovoltaic or wind power plant(s)/unit(s). Hence, this condition is N/A. c) This project does not include integration of a BESS to (an) existing solar

	other changes to the existing plant(s); (d) Integrate a BESS together with implementing a retrofit of (an) existing solar photovoltaic or wind power plant(s)/unit(s). (e) Integrate a BESS together with a Greenfield power plant that is operating in coordination with a PSP. The BESS is located at site of the greenfield renewable power plant.	photovoltaic or wind power plant(s)/unit(s) without implementing any other changes to the existing plant(s). Hence, this condition is N/A. d) This project does not include integration of a BESS together with implementing a retrofit of (an) existing solar photovoltaic or wind power plant(s)/unit(s). Hence, this condition is N/A. e) This project does not include integration of a BESS together with a Greenfield power plant that is operating in coordination with a PSP. Hence, this condition is N/A.
8	The methodology is applicable under the following conditions: (a) 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;	(a) Akocak HEPP is a hydro power plant. Hence, this condition is met. (b) The installed capacity of Akocak HEPP is 84.18 MWm/82.5 MWe. Project installed capacity has been increased from

	(b) 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; (c) In case of Greenfield project activities applicable under paragraph 5 (a) above, the project participants shall demonstrate that the BESS was an integral part of the design of the renewable energy project activity (e.g. by referring to feasibility studies or investment decision documents);	82.46 MWm / 81 MWe to 84.18 MWm / 82.5 MWe on 06-November-2017. However, the annual generation which is 257,440 MWh has remained the same. So, there is no need to change the additionality of the project, this condition is N/A. (c) This project does not include an integration of a BESS. Hence, this condition is N/A. (d) This project does not include an integration of a BESS. Hence, this condition is N/A. (e) The project activity does not involve PSP. Hence, this condition is N/A.
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(d) The BESS should be charged with electricity generated from the associated renewable energy power plant(s). Only during exigencies may the BESS be charged with electricity from the grid or a fossil fuel electricity generator. In such cases, the corresponding GHG emissions shall be accounted for as project emissions following the requirements under section 5.4.4 below. The charging using the grid or using fossil fuel electricity generator should not amount to more than 2 per cent of the electricity generated by the project renewable energy plant during a monitoring period. During the time periods (e.g. week(s), months(s)) when the BESS consumes more than 2 per cent of the electricity for charging, the project participant shall not be entitled to issuance of the certified emission reductions for the concerned periods of the monitoring period.

(e) In case the project activity involves PSP, the PSP shall utilize the electricity generated from the renewable energy power plant(s) that is operating in coordination with

	<i>the PSP during pumping mode.</i>	
9	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	The project is a hydro power plant. The project activity satisfies condition (c), as it results in a new reservoir and the power density of the project activity is 2,435.28 W/m² which is greater than 4 W/m².

	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 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.	
10	In the case of integrated hydro power projects, project participants shall: (a) Demonstrate that water flow from upstream power plants/units spill directly to the downstream reservoir and that collectively constitute to the generation	The project is not an integrated hydro power project. Hence, this condition is N/A.

	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.	
11	In the case of PSP, the project participants shall demonstrate in the PDD that the project is not using water which would have been used	The project does not include a PSP. Hence, this condition is N/A.

	to generate electricity in the baseline.	
12	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.	a) The project does not involve switching from fossil fuel use to renewable energy at the site of the project activity. b) The project is not a biomass fired power plant.
13	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 activity does not include retrofits, rehabilitations, replacements, or capacity additions. Hence, this condition is N/A.
14	In addition, the applicability conditions included in the	Given below.

	tools referred to below apply. ¹¹	
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Methodology ID	Applicability condition	Justification of compliance
TOOL07	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.
	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	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 ¹² .

¹¹ 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.

¹² <https://cdm.unfccc.int/methodologies/PAmethodologies/tools/am-tool-07-v7.0.pdf>

	capacity of off-grid power plants (in MW) should be at least 10 per cent of the total capacity of grid power plants in the electricity system; or the total electricity generation by off-grid power plants (in MWh) should be at least 10 per cent of the total electricity generation by grid power plants in the electricity system; and that factors which negatively affect the reliability and stability of the grid are primarily due to constraints in generation and not to other aspects such as transmission capacity.	
	In case of CDM projects the tool is not applicable if the project electricity system is located partially or totally in an Annex I country.	The project is not a CDM project. Hence, this condition is N/A.
	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.

Methodology ID	Applicability condition	Justification of compliance
TOOL01	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	Tool for the demonstration and assessment of additionality is applied in this project during the validation stage. Hence, this condition is applicable.

	also submit revisions to approved methodologies using the additionality tool.	
	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.

Methodology ID	Applicability condition	Justification of compliance
TOOL11		
	The tool consists of two steps. The first step provides an approach to evaluate whether the current baseline is still valid for the next crediting period. The second step provides an approach to update the baseline in case that the current baseline is not valid anymore for the next crediting period.	In the validation process, the baseline was demonstrated. This is the renewal of crediting period, and since there are no capacity additions, the current baseline is still valid.

3.3 Project Boundary

CO₂ emission is included in the baseline but the project activity does not emit any of the gases listed, in the table below.

The project boundary is considered as the National Electricity Grid of Turkey according to applied methodology. 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.

Source	Gas	Included?	Justification/Explanation
Baseline	CO ₂	Yes	Main emission source

Source		Gas	Included?	Justification/Explanation
Project	Electricity generation in baseline (Turkey's Grid)	CH ₄	No	Minor emission source
		N ₂ O	No	Minor emission source
		Other	No	N/A
	Emission from the reservoir of the proposed project	CO ₂	No	N/A
		CH ₄	No	Minor emission source (Power density greater than 10 W/m ²)
		N ₂ O	No	Minor emission source
		Other	No	N/A
	Auxiliary Diesel Generator	CO ₂	Yes	Neglected ¹³
		CH ₄	No	Minor emission source
		N ₂ O	No	Minor emission source
		Other	No	N/A

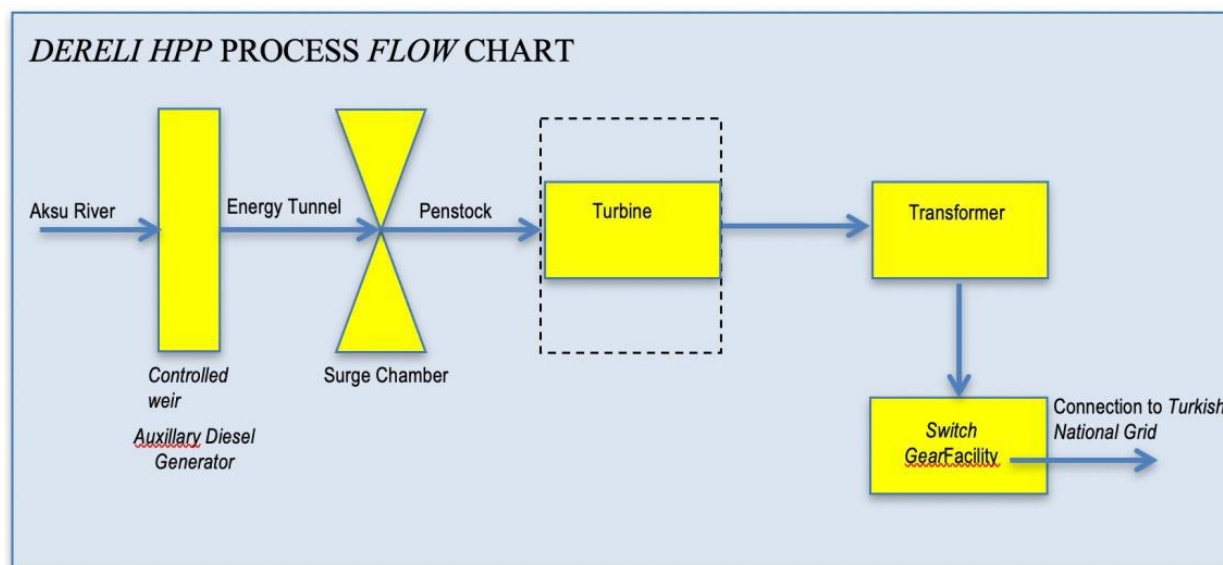


Figure 3. Project Boundary

¹³ ACM0002 Version 22.0.0 indicates that "...For all renewable energy power generation project activities, emissions due to the use of fossil fuels for the backup generator can be neglected." (Page 15 paragraph 42).

3.4 Baseline Scenario

Since the proposed project activity is the installation of a new grid-connected hydro power plant, that is renewable power plant and therefore, the baseline scenario is defined as the following based on ACM0002 (Version 22.0):

“If the project activity is the installation of a Greenfield power plant with or without a BESS as described under paragraph 5(a) or paragraph 7(a) or paragraph 7(e) above (in ACM0002, v22.0), the baseline scenario is electricity delivered to the grid by the project activity that would have otherwise been generated by the operation of grid-connected power plants and by the addition of new generation sources, as reflected in the combined margin (CM) calculations described in TOOL07.”

Since the proposed project activity is going to be connected to the Turkish national grid, the baseline scenario of the proposed project is the supply of the equivalent amount of annual power output by the existing Turkish national grid which is the continued operation of existing power plants that are mainly natural gas and coal and the addition of new sources to meet electricity demand.

In 2025, 33.6% of our electricity generation came from coal, 23% from natural gas, 15.8% from hydro, 10.9% from wind, 10.9% from solar, 3.2% from geothermal energy, and 3.1% from other sources¹⁴.

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

The tool offers 2 steps. The first step provides an approach to evaluate whether the current baseline is still valid for the next crediting period. The second step provides an approach to update the baseline in case that the current baseline is not valid anymore for the next crediting period.

The sub-steps for the Step 1 are:

Step 1.1: Assess compliance of the current baseline with relevant mandatory national and/or sectoral policies: There is no change in national/sectoral policies affecting project implementation. All policies are still valid in the second crediting period.

Step 1.2: Assess the impact of circumstances: The baseline circumstances are not valid in the second crediting period since the national grid properties / shares of each technology, etc. have been changed.

¹⁴ <https://enerji.gov.tr/infobank-energy-electricity>

Step 1.3: Assess whether the continuation of use of current baseline equipment(s) or an investment is the most likely scenario for the crediting period for which renewal is requested: There is no change in the investment type and technology in the second crediting period.

Step 1.4: Assessment of the validity of data and parameters: The default values and ex-ante values have been changed.

Although there is no change in national/sectoral policies affecting project implementation (Step 1.1), investment and technology (Step 1.3), the current situations such as margin calculations (Step 1.2) and parameters not monitored (Step 1.4) have been changed. Therefore, Step 2 has been applied.

Step 2.1: Update current baseline: The latest version of the applicable methodology and current circumstances have been used for the second crediting period.

The applicability conditions of Tool 11 are given below in detail:

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 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 emissions in the previous crediting	The combined margin is updated as per OM & BM calculations by Ministry of Energy and Resources.

	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.	The project is a greenfield activity. Since it includes a new investment and the use of new equipment, this step is not applicable.
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; 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.	The combined margin is updated as per OM & BM calculations by Ministry of Energy and Resources. Hence the assessment should proceed to Step 2.

	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.	
Step 2.1	Update the current baseline emissions for the subsequent crediting period, without reassessing the baseline scenario, based on the latest approved version of the methodology applicable to the project activity. The procedure should be applied in the context of the sectoral policies and circumstances that are applicable at the time of request for renewal of the crediting period.	The latest version of the applicable methodology and current circumstances have been used for the second crediting period
Step 2.2	If the application of Step 1.4 showed that the data and/or parameter(s) that were only determined at the start of the crediting period and not monitored during the crediting period are not valid anymore, project participants should update all applicable data and parameters, following the guidance in Step 1.4.	The data and the parameters are updated for the second crediting period.

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

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

The trend in Turkey to date and given historically slow development of alternative energy resources is to build an increasing number of thermal power plants in the future to satisfy the annual growth in energy consumption demand.

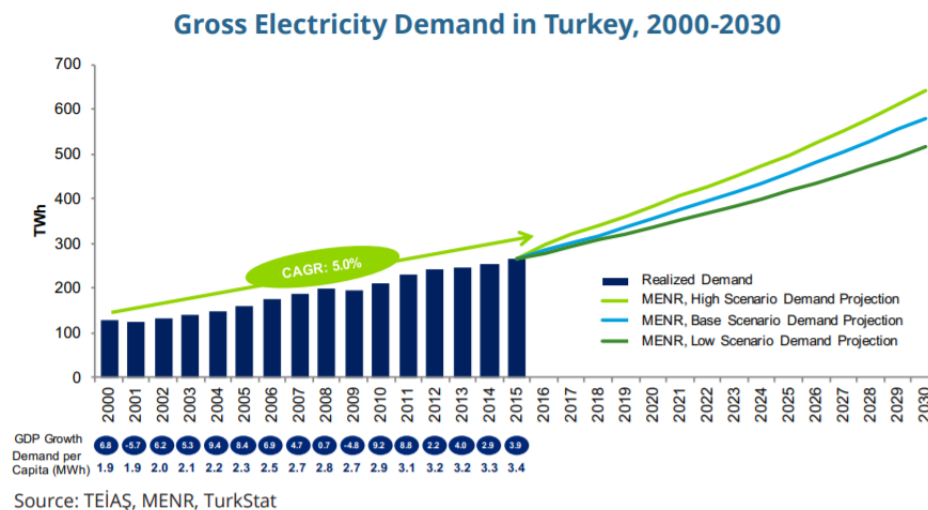


Figure 4. Projection of Turkey's electricity demand¹⁵

Turkey as an advanced developing nation has looked at dealing with energy security by developing and constructing high-capacity coal and natural gas power plants. The development of thermal power plants has been also encouraged by the large natural resource availability in Turkey, especially the abundance of economically accessible lignite. The statistics from TEİAŞ webpage show that the installed capacity that utilize lignite in Turkey has always showed an increasing trend, based on the available information covering the years from 1940 to 2019^{16 17 18}.

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

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

¹⁶ <https://webapi.teias.gov.tr/file/18800125-dc32-4c4e-8a3e-c771863e5a49?download>

¹⁷ <https://webapi.teias.gov.tr/file/07f76c00-d256-4ccb-b25e-9478c9dedc04?download>

¹⁸ <https://webapi.teias.gov.tr/file/163dfadf-80d8-4271-baf8-bc0b76710177?download>

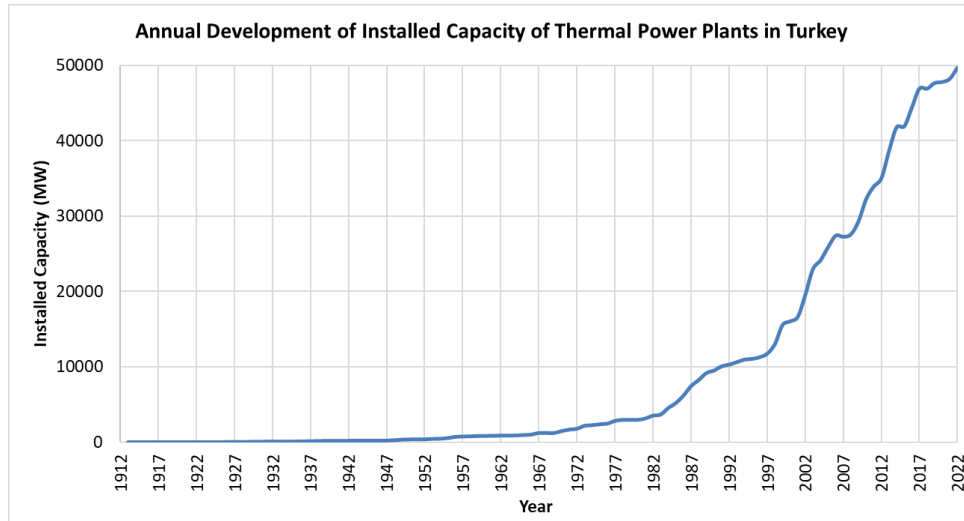


Figure 5. Development of Turkey's Thermal Power Plants' Installed Capacity¹⁹

According to the Ministry of Energy and Natural Resources statistics²⁰, share of WPPs together with geothermal power plants could hardly reach 11% in 2020 whereas share of Coal and natural gas are 20.46% (lignite and imported coal together) and 22.53%, respectively. When we look at the annual development of Turkey's gross generation in recent years, we see that grid is dominated by thermal power plants and which is boosted by increasing energy demand in parallel to increase population and per capita income. Hence, baseline of Turkey's electricity grid will continue to be dominated by fossil fuel power plants which is seen as the quickest solution in short term to meet the demand and enable energy security in supply side.

¹⁹ Published by TEİAŞ in 2023 <https://webim.teias.gov.tr/file/0c1d3422-3ffc-4a38-843f-3dd39300dd14?download>

²⁰ <https://webapi.teias.gov.tr/file/39abb292-4b3e-4e70-9e08-914d0ba9bd43?download>

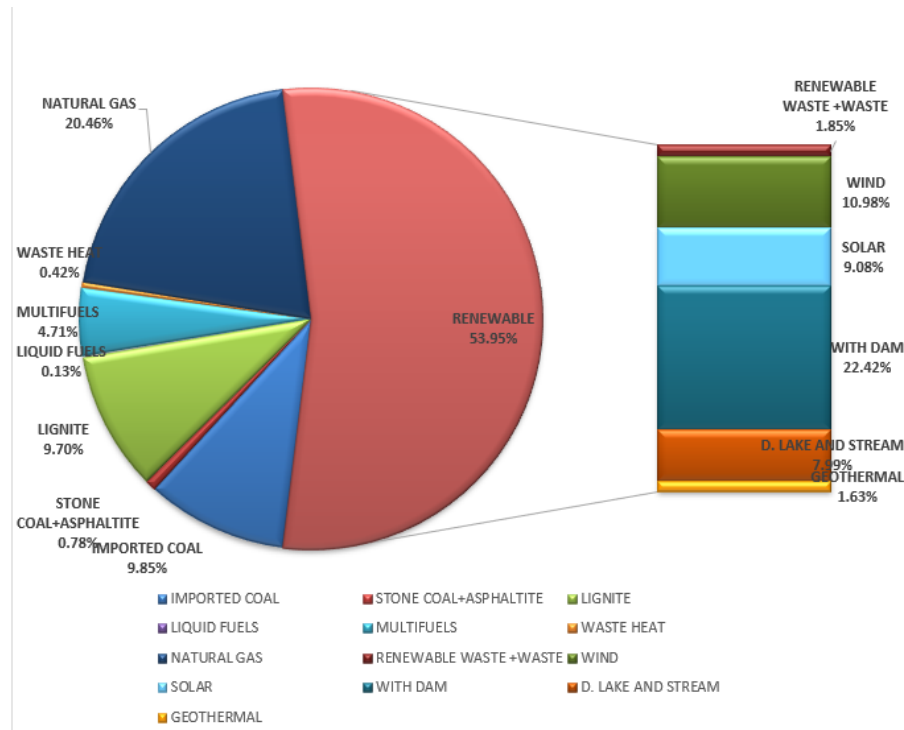


Figure 6 Distribution of installed capacity by primary energy resources, 2023²¹

Step 2.2.: Update data and parameters: Default values and ex-ante values have been revised. Combined margin is revised as follows:

$$EF_{grid,OM,y} = 0.7108 \text{ tCO}_2\text{e/MWh}$$

$$EF_{grid,BM,y} = 0.3721 \text{ tCO}_2\text{e/MWh}$$

$$EF_{grid,CM,y} = EF_{grid,OM,y} \times 0.25 + EF_{grid,BM,y} \times 0.75$$

$$EF_{grid,CM,y} = 0.7108 \times 0.25 + 0.3721 \times 0.75$$

$$EF_{grid,CM,y} = 0.4568 \text{ tCO}_2\text{/MWh}$$

Therefore, new combined margin is calculated using values by Ministry of Energy and Natural Resources which is 0.4568 tCO₂/MWh²².

3.5 Additionality

²¹ Published by TEİAŞ in 2023 <https://webim.teias.gov.tr/file/2acaeaa8-542e-47a7-a9f5-73e013bb93ff?download>

²²

https://enerji.gov.tr//Media/Dizin/EVCED/tr/ÇevreVeİklim/İklimDeğişikliği/TUESEmisyonFktr/Belgeler/Sebeke_EF_Bilgi_Formu_2022.pdf

The proposed project activity reduces GHG emissions by substituting fossil fuel based electricity generation by renewable resources (hydro) based electricity generation. This is the second crediting period. In the first crediting period, additionality of the project was presented. There has been no capacity change in the project between the first and the second crediting period. The Project is in compliance with all required relevant regulations but is not a mandatory Project. There is no change in the relevant national and/or sectoral regulations with respect to project activity or its technology till date through which the project activity is not found mandated by regulations. There is no breach of any legislation, and all required permits are obtained.

3.5.1 Regulatory Surplus

Is the project located in an UNFCCC Annex 1 or Non-Annex 1 country?

☒ Annex 1 country ☐ Non-Annex 1 country

Are the project activities mandated by any law, statute, or other regulatory framework?

☐ Yes ☒ No

If the project is located inside a Non-Annex 1 country and the project activities are mandated by a law, statute, or other regulatory framework, are such laws, statutes, or regulatory frameworks systematically enforced?

☐ Yes ☐ No

3.5.2 Additionality Methods

In the first crediting period, additionality of the project was presented. Additionality of the proposed project has been assessed according to the “Tool for the demonstration and assessment of additionality”. The project activity was considered as additional to the baseline scenario. There has been no capacity change in the project between the first and the second crediting period.

3.6 Methodology Deviations

There are no methodological deviations in the project.

4 QUANTIFICATION OF ESTIMATED GHG EMISSION REDUCTIONS AND REMOVALS

4.1 Baseline Emissions

Accordingly, the baseline emissions BE_y are calculated as following:

$$BE_y = (EG_{PJ,y}) \times EF_{grid,CM,y}$$

where,

BE_y	Baseline emissions (tCO ₂ e)
$EG_{PJ,y}$	Quantity of net electricity generation that is produced and fed into the grid as a result of the implementation of the CDM project activity in year y (MWh)
$EF_{grid,CM,y}$	Combined margin CO ₂ emission factor for grid connected power generation in year y calculated using the latest version of TOOL07 (v 07.0) "Tool to calculate the emission factor for an electricity system" (tCO ₂ e/MWh)

Emission factor calculated according to selected methodology. In the Turkey's National Electricity Network Emission Factor Factsheet²³, OM is calculated as 0.7108 tCO₂/MWh whereas BM is 0.3721 tCO₂/MWh). Therefore, CM is calculated as 0.25 and 0.75 weightage factor given to OM and BM, respectively (since this is the second crediting period).

$$EF_{grid,CM,y} = EF_{grid,OM,y} \times 0.25 + EF_{grid,BM,y} \times 0.75$$

$$EF_{grid,CM,y} = 0.7108 \times 0.25 + 0.3721 \times 0.75 = 0.4568 \text{ tCO}_2/\text{MWh}$$

According to the applied methodology (ACM0002, v22.0, para 59), the quantity of net electricity generation is calculated as follows;

$$EG_{PJ,y} = EG_{facility,y}$$

where,

$EG_{facility,y}$	Quantity of net electricity generation supplied by the project plant/unit to the grid in year y (MWh/yr)
$EG_{PJ,y}$	Quantity of net electricity generation that is produced and fed into the grid as a result of the implementation of the CDM project activity in year y (MWh)

²³

https://enerji.gov.tr//Media/Dizin/EVCED/tr/ÇevreVeİklim/İklimDeğişikliği/TUESEmisyonFktr/Belgeler/Sebeke_EF_Bilgi_Formu_2022.pdf

Accordingly, BE_y is calculated as follows:

$$BE_y = 257,440 \text{ MWh/y} \times 0.4568 \text{ tCO}_2/\text{MWh} = 117,598 \text{ tCO}_2/\text{year}$$

4.2 Project Emissions

As per ACM0002 "Grid-connected electricity generation from renewable sources", v22,

"For most renewable power generation project activities, $PE_y = 0$. However, some project activities may involve project emissions that can be significant. These emissions shall be accounted for as project emissions by using the following equation:

$$PE_y = PE_{FF,y} + PE_{GP,y} + PE_{HP,y} + PE_{BESS,y} + PE_{PSP,y}$$

where:

PE_y = Project emissions in year y ($\text{tCO}_2\text{e/yr}$)

$PE_{FF,y}$ = Project emissions from fossil fuel consumption in year y (tCO_2/yr)

$PE_{GP,y}$ = Project emissions from the operation of dry, flash steam or binary geothermal power plants in year y ($\text{t CO}_2\text{e/yr}$)²⁴

$PE_{HP,y}$ = Project emissions from water reservoirs of hydro power plants in year y ($\text{tCO}_2\text{e/yr}$)

$PE_{BESS,y}$ = Project emissions from charging of a BESS using electricity from the grid or from fossil fuel electricity generators ($\text{tCO}_2\text{e/yr}$)

$PE_{PSP,y}$ = Project emissions from utilizing electricity from the grid for pumping operation of PSP in excess to the production of the renewable power plant operating in coordination with the PSP ($\text{tCO}_2\text{e/yr}$)

- Since this project uses hydroelectric power, $PE_{GP,y}$ is "0" (tCO_2/yr)
- The only emission source in the plant is the diesel generator which is used as auxiliary power source when there is no electricity generation in the plant or supply by the grid. In urgent cases, a diesel-powered generator will be operated for the daily consumption of personnel and the building, which is negligible. Project emissions are taken as zero. The same is also stated in paragraph 42 of "ACM0002: Grid-connected electricity generation from renewable sources, v22.0". Hence it is neglected. Therefore, $PE_{FF,y} = 0$ (tCO_2/yr)

Beside of the diesel generator, other potential project emission for this proposed project is $PE_{HP,y}$.

²⁴

<https://enerji.gov.tr//Media/Dizin/EVCED/tr/%C3%87evreVe%C4%B0klm/%C4%B0klmDe%C4%9Fi%C5%9Fikli%C4%9Fi/TUES>

However, if the power density of the project activity is greater than 10 W/m² than $PE_{HP,y} = 0$

The power density (PD) of the project activity is calculated as follows:

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

Where:

PD = Power density of the project activity (W/m²)

Cap_{PJ} = Installed capacity of the hydro power plant after the implementation of the project activity (W)

Cap_{BL} = Installed capacity of the hydro power plant before the implementation of the project activity (W). For new hydro power plants, this value is zero

A_{PJ} = Area of the reservoir measured in the surface of the water, after the implementation of the project activity, when the reservoir is full (m²)

A_{BL} = Area of the reservoir 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.

For proposed project HEPP,

$$Cap_{PJ} = 82,500,000 \text{ W}$$

$$Cap_{BL} = 0.0 \text{ W}$$

$$A_{PJ} = 33,877.016 \text{ (m}^2\text{)}^{25}$$

$$A_{BL} = 0.0 \text{ (m}^2\text{)}$$

Therefore, PD is calculated as;

$$PD = \frac{82,500,000 - 0}{33,877.016 - 0}$$

$$PD = 2,435.28 \text{ W/m}^2$$

Since the power density of the project activity is greater than 10 W/m², $PE_{HP,y} = 0$. Therefore;

$$PE_y = 0$$

²⁵ Reservoir area, Annex 6 of registered PD

4.3 Leakage Emissions

The energy generating equipment is not transferred from or to another activity. Therefore, leakage is also considered as “0”.²⁶

$$LE_y = 0$$

As a result, Total Emission Reduction is:

$$ER_y = BE_y$$

4.4 Estimated GHG Emission Reductions and Carbon Dioxide Removals

Vintage period	Estimated baseline emissions (tCO ₂ e)	Estimated project emissions (tCO ₂ e)	Estimated leakage emissions (tCO ₂ e)	Estimated reduction VCU (tCO ₂ e)	Estimated removal VCU (tCO ₂ e)	Estimated total VCUs (tCO ₂ e)
01-July-2020 to 31-Dec-2020	59,282	0	0	59,282	0	59,282
01-Jan-2021 to 31-Dec-2021	117,598	0	0	117,598	0	117,598
01-Jan-2022 to 31-Dec-2022	117,598	0	0	117,598	0	117,598
01-Jan-2023 to 31-Dec-2023	117,598	0	0	117,598	0	117,598
01-Jan-2024 to 31-Dec-2024	117,598	0	0	117,598	0	117,598

²⁶ <https://cdm.unfccc.int/UserManagement/FileStorage/ROI1X9LQ7W2GOYHSMBFCPE3VKZ685>

01-Jan-2025 to 31-Dec-2025	117,598	0	0	117,598	0	117,598
01-Jan-2026 to 31-Dec-2026	117,598	0	0	117,598	0	117,598
01-Jan-2027 to 31-Dec-2027	117,598	0	0	117,598	0	117,598
01-Jan-2028 to 31-Dec-2028	117,598	0	0	117,598	0	117,598
01-Jan-2029 to 31-Dec-2029	117,598	0	0	117,598	0	117,598
01-Jan-2030 to 30-June-2030	58,315	0	0	58,315	0	58,315
Total	1,175,979	0	0	1,175,979	0	1,175,979

5 MONITORING

5.1 Data and Parameters Available at Validation

Data / Parameter	EF _{grid,CM,y}
Data unit	tCO ₂ e/year
Description	Combined margin CO ₂ emission factor for grid connected power generation in year y calculated using the “Tool 07: Tool to calculate the emission factor for an electricity system v07.0”.

Source of data	Calculated as per Tool 07: Tool to calculate the emission factor for an electricity system v07.0 The emission factor has been calculated using the data provided by the Turkey's National Electricity Network Emission Factor Factsheet ²⁷ .
Value applied	$EF_{grid,OM,y} = 0.7108 \text{ tCO}_2\text{e/MWh}$ $EF_{grid,BM,y} = 0.3721 \text{ tCO}_2\text{e/MWh}$ $EF_{grid,CM,y} = EF_{grid,OM,y} \times 0.25 + EF_{grid,BM,y} \times 0.75$ $EF_{grid,CM,y} = 0.7108 \times 0.25 + 0.3721 \times 0.75$ $EF_{grid,CM,y} = 0.4568 \text{ tCO}_2\text{e/MWh}$
Justification of choice of data or description of measurement methods and procedures applied	Data used is from the Official Page of Ministry of Energy and Natural Sources. It is the most up-to date and reliable data available for the Turkish grid.
Purpose of Data	Calculation of baseline emissions
Comments	Emission Factor is fixed at ex-ante calculation.

The following parameters are classified as “Data and parameters not monitored” in the applied methodology (ACM0002, version 22.0, para 81). However, since these parameters are available in equation for the calculation of power density, these are also included to this section.

Data / Parameter	Cap _{BL}
Data unit	W
Description	Installed capacity of the hydro power plant before the implementation of the project activity. For new hydro power plants, this value is zero.
Source of data	Project site
Value applied	0 (as per the applied methodology)
Justification of choice of data or description of measurement methods and procedures applied	Data is from the applied methodology, ACM0002, version 22.0.

²⁷

https://enerji.gov.tr//Media/Dizin/EVCED/tr/ÇevreVeİklim/İklimDeğişikliği/TUESEmisyonFktr/Belgeler/Sebeke_EF_Bilgi_Formu_2022.pdf

Purpose of Data	Calculation of Power Density
Any Comments	-

Data / Parameter	ABL
Data unit	W
Description	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 (m ²). For new reservoirs, this value is zero.
Source of data	Project site
Value applied	0 (as per the applied methodology)
Justification of choice of data or description of measurement methods and procedures applied	Data is from the applied methodology, ACM0002, version 22.0.
Purpose of Data	Calculation of Power Density
Any Comments	-

5.2 Data and Parameters Monitored

Data / Parameter	EGfacility, y
Data unit	MWh
Description	Quantity of net electricity generation supplied by the project plant/unit to the grid in year y (MWh/yr)
Source of data	EPIAS values (main source) and Site records (cross-check source)
Description of measurement methods and procedures to be applied	The internal consumption of the facility was subtracted from the gross generation. The internal consumption was also taken from the facility's records and from the EPIAS data. The main source of this data is EPIAS generation screenshots, and this data is cross-checked with site records.

Frequency of monitoring/recording	Continuous measurement at the site and daily and monthly recording were applied. The plant manager and the staff extracted the records regularly every day. The monthly records gathered by TEİAŞ remotely.															
Value applied	2,574,400 MWh for the whole crediting period (257,440 MWh/year)															
Monitoring equipment	Electricity meters. Meters used in the project are in compliance with the regulation ²⁸ on meters issued by relevant government agencies and have 0.5S accuracy class.															
QA/QC procedures to be applied	Maintenance and calibration of the metering devices will be made by TEİAŞ periodically. If there is a significant difference between the readings of two devices, maintenance and tests of the metering devices and the associated equipment will be done before waiting for the periodical maintenance. The test/calibration date of the old meters is 06-May-2010. The calibration frequency is 10 years as per the regulations²⁹. The first index protocol date of the old meters is 27-May-2010. The periodic tests of the old meters were conducted on 08-December-2012, 11-December-2013, 10-October-2014, and 16-October-2015. The test/calibration of the new meters were done on 11-March-2020. The meters were changed on 13-August-2020 (first index protocol date). The periodic tests of the new meters were done on 25-March-2022 and on 20-March-2024. Old and new meter info are given below: Old meters with the accuracy class of 0.5s: <table><tr><th>Brand</th><th>Type</th><th>Serial Number</th></tr><tr><td>ACTARIS</td><td>SL761A071</td><td>53064405 (main- unit 1)</td></tr><tr><td>ACTARIS</td><td>SL761A071</td><td>53064406 (spare- unit 1)</td></tr><tr><td>ACTARIS</td><td>SL761A071</td><td>53064407 (main- unit 2)</td></tr><tr><td>ACTARIS</td><td>SL761A071</td><td>53064408 (spare- unit 1)</td></tr></table>	Brand	Type	Serial Number	ACTARIS	SL761A071	53064405 (main- unit 1)	ACTARIS	SL761A071	53064406 (spare- unit 1)	ACTARIS	SL761A071	53064407 (main- unit 2)	ACTARIS	SL761A071	53064408 (spare- unit 1)
Brand	Type	Serial Number														
ACTARIS	SL761A071	53064405 (main- unit 1)														
ACTARIS	SL761A071	53064406 (spare- unit 1)														
ACTARIS	SL761A071	53064407 (main- unit 2)														
ACTARIS	SL761A071	53064408 (spare- unit 1)														

²⁸ <https://www.epdk.gov.tr/Detay/Icerik/3-0-0-128/tebligler>

²⁹ <https://www.sanayi.gov.tr/medya/duyurular/2025-yili-olcu-ve-olcu-aletleri-aletleri-periyodik-muayene-duyuru-metni>

	New meters with the accuracy class of 0.5s:	
	Brand	Type
	EMH	LZQJ-XC
	EMH	LZQJ-XC
	EMH	LZQJ-XC
	EMH	LZQJ-XC
Purpose of data		ER calculations
Calculation method		N/A
Comments		-

Data / Parameter	Cap _{PJ}
Data unit	W
Description	Installed capacity of the hydro power plant after the implementation of the project activity
Source of data	Project site
Description of measurement methods and procedures to be applied	Generation license
Frequency of monitoring/recording	Once at the beginning of each crediting period
Value applied	82,500,000 W
Monitoring equipment	N/A
QA/QC procedures to be applied	N/A

Purpose of data	To understand the necessity of calculation of project emission according to applied methodology
Calculation method	N/A
Comments	-

Data / Parameter	A _{PJ}
Data unit	m ²
Description	Area of the reservoir measured on the surface of the water, after the implementation of the project activity, when the reservoir is full.
Source of data	Project site
Description of measurement methods and procedures to be applied	Measured from topographical surveys or maps
Frequency of monitoring/recording	Once at the beginning of each crediting period
Value applied	33,877.016 (Erikli Weir) m ² ³⁰
Monitoring equipment	N/A
QA/QC procedures to be applied	N/A
Purpose of data	To understand the necessity of calculation of project emission according to applied methodology
Calculation method	N/A
Comments	Maximum area is given in Reservoir Map and considered in calculations. Annual measurements are not higher than baseline value.

³⁰ Akocak HEPP Reservoir map

5.3 Monitoring Plan

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

In order to demonstrate the emission reduction, only the required data is the net electricity delivered to the grid by the project activity.

Net electricity generation is measured and recorded by both TEIAS and project owners for billing purposes therefore no new additional protocol is needed monitoring emission reduction. Power Plant Manager, is responsible for the electricity generated, gathering all relevant data and keeping the records. He is informed about VER concepts and mechanisms and how to monitor and collect the data which is used for emission reduction calculations.

Generation data collected during crediting period is submitted to GTE who is responsible for calculating the emission reduction subject to verification: Generation data is used to prepare monitoring reports which is used to determine the vintage from the project activity. These reports are submitted to the duly authorized and appointed Designated Operational Entity 'DOE' before each verification period.

The monitoring system organization chart is shown in Figure 7 below, in which the authority and responsibility of project management are defined.

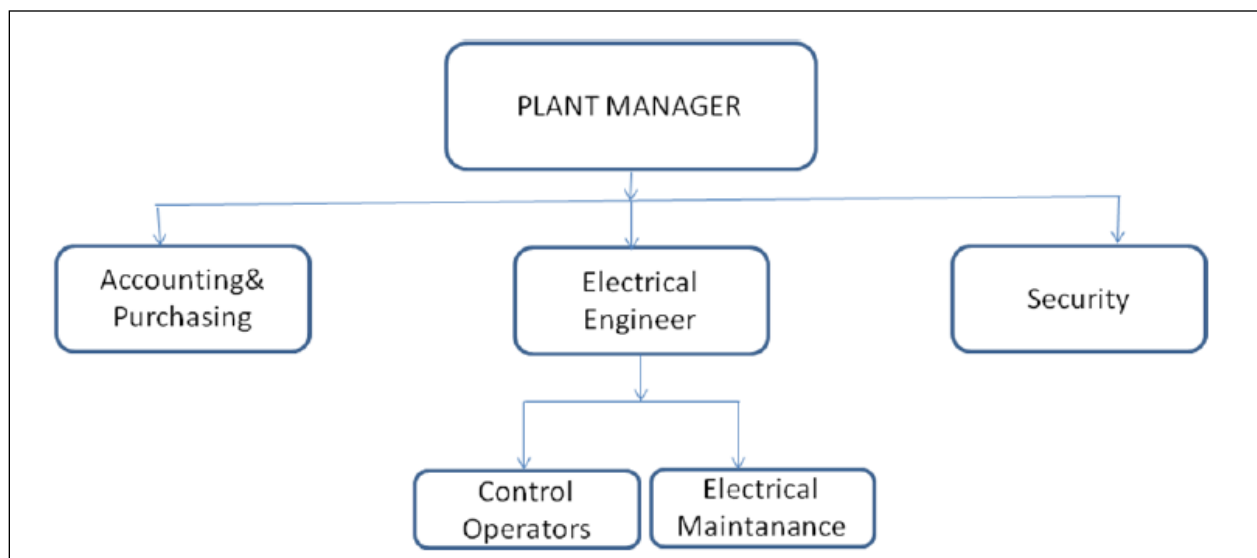


Figure 7. Operational structure of Akocak HEPP

VER Team Members are;

Plant Manager: Overall responsibility of compliance with VER monitoring plan

Electrical Engineer: Responsible for day to day running of plant, recording and monitoring of relevant data and periodic reporting

Accounting Manager: Responsible for keeping data about power sales, invoicing and purchasing.

Control Operators & Electrical Maintenance: Staff is responsible for day to day operation and maintenance of the plant and equipment. All staffs were trained and had certificate for working with high voltage equipment.

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

Installation of meter and data monitoring are carried out according to the regulations by TEIAS. Readings are done using main metering devices and spare metering device is used for comparison only. Data from metering devices is recorded by TEIAS monthly and form the basis for invoicing using the template formed by TEIAS³¹. In addition to the two metering devices, generation of the Akocak HEPP can be cross checked from EPIAS which is accessible using a password provided to electricity generation companies. Both the EPIAS data and the facility/TEAIS records are taken into account for comparison and to identify any anomalies.

The test/calibration date of the old meters is 06-May-2010. The first index protocol date of the old meters is 27-May-2010. The periodic tests of the old meters were conducted on 08-December-2012, 11-May-2013, 10-October-2014, and 16-October-2015. Technical information of the meters is tabulated below:

Brand	Type	Serial Number	Accuracy Class
ACTARIS	SL761A071	53064405 (main- unit 1)	0.5S
ACTARIS	SL761A071	53064406 (spare- unit 1)	0.5S
ACTARIS	SL761A071	53064407 (main- unit 2)	0.5S
ACTARIS	SL761A071	53064408 (spare- unit 1)	0.5S

The meters were changed on 13-August-2020 after the termination of the crediting period. The new meter information is given below:

Brand	Type	Serial Number	Accuracy Class
EMH	LZQJ-XC	9674570 (main- unit 1)	0.5S

³¹ http://www.teias.gov.tr/mali/GDUY/PRO_FORM/OLCUM/K01.xls

EMH	LZQJ-XC	9674571 (spare- unit 1)	0.5S
EMH	LZQJ-XC	9674572 (main- unit 2)	0.5S
EMH	LZQJ-XC	9674573 (spare- unit 1)	0.5S

The test/calibration of the new meters were done on 11-March-2020. The meters were changed on 13-August-2020 (first index protocol date). The periodic tests of the new meters were done on 25-March 2022 and on 20-March 2024.

In case of a major failure at both metering at the same time, electricity generation by the plant since the last measurement is able to be monitored by another metering device at the inlet of the main substation operated by TEIAS where the electricity is fed to the grid. Electricity generated by the power plant is also available at the SCADA (supervisory control and data acquisition system) of the grid operator TEIAS, through the RTU (remote terminal unit) installed at the power plant and supervised by the Load Dispatch Centre of TEIAS.

The net electricity fed to the grid is measured continuously and recorded monthly by the TEIAS and plant staff. For consistency, recorded data are compared with electricity sale receipts.

All data collected are recorded daily and archived both as electronically and as hard copy for at least two years.

Calibration of the metering devices was made by TEIAS and sealed during first operation of the plant. The meters were calibrated by TEIAS when exists significant inconsistency between two devices using a fixed template or upon request by either project owner or TEIAS.

APPENDIX 1: COMMERCIALLY SENSITIVE INFORMATION

There is no commercially sensitive information about the project activity. Hence, this section is not applicable.

Section	Information	Justification

APPENDIX 2: EMISSION FACTOR REFERENCES

	Türkiye NATIONAL ELECTRICITY GRID EMISSION FACTOR INFORMATION FORM	Document Number: ETKB-EVÇED-FRM-039 Rev.03 Issued On: 12.02.2024
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Calculation Period	Calculation Release Date	Calculation Revision Number
2022	26.11.2024	00

Aim:

Information on the annual calculated emission factor of Türkiye's national electricity grid.

Scope:

This information sheet contains the calculated values for the Operating Margin (OM), Build Margin (BM), and Combined Margin (CM) Emission Factors for the relevant year.

Calculation Methodology:

The United Nations Framework Convention on Climate Change (UNFCCC) Clean Development Mechanism Tool 07-V07.0 methodology was used.

Dataset:

1. TEİAŞ (Turkish Electricity Transmission Corporation) Türkiye electricity production-consumption and loss statistics.
2. The electricity generation (1.A.1.ai) emission values included in the Common Reporting Format (CRF) tables prepared within the scope of Türkiye's National Greenhouse Gas Inventory Report.
3. From TEİAŞ Load Dispatch Department: chronological order of commissioning dates of electricity generation plants, plant names, fuel types, installed capacity values, and electricity production amounts for the calculated year.
4. Check the voluntary carbon reduction certification ownership status from the Gold Standard (GS), Verified Carbon Standard (VCS), and Global Carbon Council (GCC) websites.
5. The power plant efficiency figures were taken from the Clean Development Mechanism (CDM) Tool 09-V03.0.

Electricity Grid Emission Factor:

Factor Type	Year	Value (tCO ₂ /MWh)
Activity based margin emission factor	2022	0.7108
Development-based margin emission factor	2022	0.3721

Figure 8. Türkiye's National Electricity Network Emission Factor Factsheet (released on 26/11/2024), page 1 (translation)

	TÜRKİYE ULUSAL ELEKTRİK ŞEBEKESİ EMİSYON FAKTÖRÜ BİLGİ FORMU	Doküman No Revizyon / Yayın Tarihi	ETKB-EVÇED-FRM-039 Rev.03 12.03.2024
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Hesaplama Dönemi	Hesaplama Yayın Tarihi	Hesaplama Revizyon No
2022	26.11.2024	00

Amaç:

Yıllık olarak hesaplanan Türkiye ulusal elektrik şebekesi emisyon faktörünün bilgilendirilmesi.

Kapsam:

Bu bilgi formunda Faaliyet Temelli Marj (Operating Margin-OM), Gelişim Temelli Marj (Build Margin-BM) ve Birleşik Marj (Combined Margin-CM) Emisyon Faktörlerinin ilgili yıl için hesaplanan değerleri yer almaktadır.

Hesaplama Metodolojisi:

Birleşmiş Milletler İklim Değişikliği Çerçeve Sözleşmesi (UNFCCC)'nin Temiz Kalkınma Mekanizması Tool 07-V07.0 yöntemi kullanılmıştır.

Veri Seti:

1. TEİAŞ Türkiye elektrik üretim-tüketim ve kayıpları istatistikleri,
2. Türkiye'nin Ulusal Sera Gazı Envanter Raporu kapsamında hazırlanan Ortak Raporlama Formatı- Common Reporting Format (CRF) tablolarında yer alan elektrik üretimi (1.A.1.a.i) emisyon değerleri,
3. TEİAŞ Yük Tevzi Daire Başkanlığı'ndan elektrik üretim santrallerinin kronolojik sıra ile devreye alınma tarihleri, santral isimleri, yakıt tipleri, kurulu güç değerleri, hesaplanan yıl için elektrik üretim miktarları,
4. Gold Standard (GS), Verified Carbon Standard (VCS) ve Global Carbon Council (GCC) web adreslerinden gönüllü karbon azaltım sertifikası sahiplik durumu ve
5. Temiz Kalkınma Mekanizması-Clean Development Mechanism (CDM) Tool 09-V03.0'den santral verim rakamları kullanılmıştır.

Elektrik Şebekesi Emisyon Faktörü:

Faktör Türü	Yılı	Değeri (tCO ₂ /MWh)
Faaliyet temelli marj emisyon faktörü	2022	0,7108
Gelişim temelli marj emisyon faktörü	2022	0,3721

Figure 9. Türkiye's National Electricity Network Emission Factor Factsheet (released on 26/11/2024), page 1 (original)

 T.C. ENERJİ VE İKLİM BAKANLIĞI	Türkiye NATIONAL ELECTRICITY GRID EMISSION FACTOR INFORMATION FORM	Document Number	ETKR-EVÇED-FRM-039 Rev 03
		Date	12.03.2024

Activity-based margin and development-based margin emission factor figures are used in calculating the combined margin emission factor.

Using the calculated activity-based margin and development-based margin, two different combined margin emission factors were calculated for solar and wind power plants and other renewable energy power plants.

Factor Type	Year	Value (tCO ₂ /MWh)
Combined margin emission factor (solar and wind)	2022	0.6261
Combined margin emission factor (other renewables)	2022	0.5415

In calculating greenhouse gas emission reductions to be achieved through electricity generation from renewable energy sources, combined margin emission factors calculated according to the type of source can be used.

EVÇED, Department of Environment and Climate, Phone: +90 312 546 56 25/26,
Email: cevre.iklim@enerji.gov.tr

Legal Information:

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Figure 10. Türkiye's National Electricity Network Emission Factor Factsheet (released on 26/11/2024), page 2 (translation)

 T.C. ENERJİ VE İKLİM BAKANLIĞI	TÜRKİYE ULUSAL ELEKTRİK ŞEBEKESİ EMİSYON FAKTÖRÜ BİLGİ FORMU	Doküman No Revizyon / Yayın Tarihi	ETKR-EVÇED-FRM-039 Rev.03 12.03.2024
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Faaliyet temelli marj ve gelişim temelli marj emisyon faktörü rakamları birleşik marj emisyon faktörünün hesaplanmasında kullanılmaktadır.

Hesaplanan faaliyet temelli marj ve gelişim temelli marj kullanılarak **güneş ve rüzgâr kaynaklı elektrik üretim santralleri ve diğer yenilenebilir enerji santralleri için iki farklı birleşik marj emisyon faktörü** hesaplanmıştır.

Faktör Türü	Yılı	Değeri (tCO ₂ /MWh)
Birleşik marj emisyon faktörü (güneş ve rüzgâr)	2022	0,6261
Birleşik marj emisyon faktörü (diğer yenilenebilir)	2022	0,5415

Yenilenebilir enerji kaynaklı elektrik üretimi ile sağlanacak sera gazı salım (SGS) **azaltım hesaplamalarında** kaynak türüne göre hesaplanan **birleşik marj emisyon faktörleri** kullanılabilir.

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Yasal Bilgilendirme:

Yayımlanan bilgilerin güncelliği, doğruluğu, güvenliği ve tamlığı konusunda tüm titiz çalışmalara rağmen olabilecek hatalardan Enerji Verimliliği ve Çevre Dairesi (EVÇED) hiçbir taahhüt altına girmez ve sorumluluk kabul etmez. Bilgilerin yanlış kullanılması veya yorumlanması sonucunda doğrudan veya dolaylı bir zarar oluşması halinde EVÇED'e hiçbir borç, sorumluluk veya mükellefiyet yüklenemez. EVÇED bilgilendirmede yer alan bilgileri önceden bildirimde bulunmaksızın değiştirebilir veya kullanım dışı bırakabilir.

Figure 11. Türkiye's National Electricity Network Emission Factor Factsheet (released on 26/11/2024), page 2 (original)