

TEMPLATE

MONITORING REPORT

PUBLICATION DATE **14.10.2020**

VERSION **v. 1.1**

RELATED SUPPORT - **TEMPLATE GUIDE Monitoring Report v. 1.1**

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Key Project Information

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KEY PROJECT INFORMATION

Key Project Information

GS ID (s) of Project (s)	GS729
Title of the project (s) covered by monitoring report	Selale HEPP
Version number of the PDD/VPA-DD (s) applicable to this monitoring report	09
Version number of the monitoring report	10
Completion date of the monitoring report	11/06/2025
Date of project design certification	24/03/2024
Date of Last Annual Report	01/01/2025 (for 01/01/2023 – 31/12/2023) 02/05/2025 (for 01/01/2024 – 31/12/2024)
Monitoring period number	1 st (2 nd Crediting Period)
Duration of this monitoring period	18/03/2023 – 31/07/2024
Project Representative	Muradiye Elektrik Üretim A.Ş. (Project Owner, Private Entity) GTE Karbon Sürdürülebilir Enerji Eğitim Danışmanlık Ve Tic. A.Ş. (Project Developer, Private Entity)
Host Country	Turkey
Activity Requirements applied	☐ Community Services Activities ☒ Renewable Energy Activities ☐ Land Use and Forestry Activities/Risks & Capacities ☐ N/A
Methodology (ies) applied and version number	ACM0002 – “Grid connected electricity generation from renewable sources” – Version 21.0
Product Requirements applied	☒ GHG Emissions Reduction & Sequestration ☐ Renewable Energy Label ☐ N/A

Table 1 – Sustainable Development Contributions Achieved

Sustainable Development Goals Targeted	SDG Impact	Amount Achieved	Units/ Products
SDG 13 Climate Action (mandatory)	CO ₂ emission reduction	17,567	tCO ₂ (GSVers)
SDG 7 Affordable and Clean Energy	Providing clean and affordable energy	38,059	MWh
SDG 8 Decent Work and Economic Growth	Creating job opportunities	9	People

Table 2 – Product Vintages

		Amount Achieved
Start Dates	End Dates	VERs (tCO ₂)
18/03/2023	31/12/2023	5,633
01/01/2024	31/07/2024	11,934

SECTION A. DESCRIPTION OF PROJECT

A.1. General description of project

The Selale HEPP (Hydro Electric Power Plant) has been developed by Muradiye Elektrik Üretim A.Ş.. The project is reducing national energy deficit and development of local industries as it allows the use of local sources for energy generation to meet the increasing demands. The project is located 5 km on the north of Muradiye District of Van Province in Türkiye on Bendimahi Creek. Selale HEPP has a capacity of 13.650 MWm / 13.377 MWe, and is composed of Selale Regulator and Selale Powerhouse. Total emission reduction has been calculated as 17,567 tCO₂ while total electricity generation has been calculated as 38,059 MWh for this monitoring period. Annual total emission reduction has been calculated as 12,772 tCO₂ while annual total electricity generation has been calculated as 27,672 MWh.

Also called Muradiye II HEPP, Selale HEPP is part of the Muradiye Ayrancilar HEPP which involves Muradiye I HEPP composed of Ayrancilar Regulator and Ayrancilar Powerhouse. The two projects had been planned as one initially; however, the project design was changed to preserve Muradiye Waterfall and the projects were separated. Accordingly, Ayrancilar HEPP remains in the upstream of Selale HEPP which has a capacity of 28.650 MWm / 28.077 MWe with an expected electricity generation of 114,437 GWh. The distance between the two projects is about 1.1 km and is working independently of each other. Electricity generated at Ayrancilar HEPP is fed to the outlet of Selale HEPP where both are connected to the national grid at 154 kV Erciş TM, Transmission Center, with a 5 km-long energy transmission line. Both Muradiye I (i.e. Selale HEPP) and Muradiye II (i.e. Ayrancilar HEPP) are connected to the same electricity meter.

The project is a small-scale project since the installed capacity of the project is below 15 MW. In this scope, 3x(4.550 MWm/4.459 MWe) were installed. The project uses Orient horizontal axis generators with total electrical output capacity of 13.650 MWm / 13.377 MWe with the purpose of contributing to the national economy the meeting the increased electricity demand. The project complies with the relevant regulations and laws in Türkiye. The type of turbine is Francis Type – Horizontal axis.

In line with Turkish environmental regulations, an “Environmental Impact Assessment (EIA) Exemption Letter” was approved by the Ministry of Environment and Forestry on

08/08/2007. The project was licenced on 14/06/2007 (Licence No. EÜ/1224-3/870). The power plant is connected to the national grid at Erciş TM, 154 kV substation.

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. 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”.

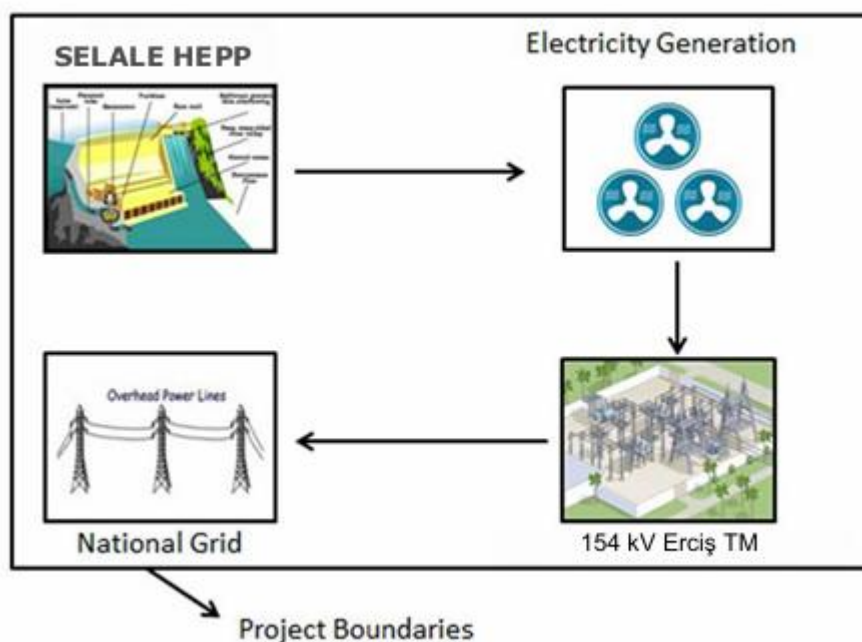


Figure 1. Project boundary

Table 3. Milestone Table for Selale HEPP Project

Milestone	Date
License Issuance	14/06/2007
EIA Exemption	08/08/2007
Construction Agreement*	26/11/2007

Start date of the project activity	26/11/2007 ¹
Start of Construction	01/12/2007
Equipment Purchase Contract	14/01/2008
License Amendment	13/03/2008
LCS Meeting	16/04/2009
Commissioning of Selale HEPP Unit 1-2-3	25/03/2011
Commissioning of Ayrancilar HEPP Unit 1 and Unit 2	25/08/2011
Commissioning of Ayrancilar HEPP Unit 3	14/04/2012
First Crediting Period	25/03/2012 – 24/03/2019
Connection Agreement	05/07/2019
Second Crediting Period	25/03/2019 – 24/03/2026
System Usage Agreement	05/03/2021
First Monitoring Period of the Second Crediting Period	18/03/2024 – 31/07/2024

*Date of investment decision

The purpose of the project is to generate clean energy by harnessing the hydro power and providing the energy to the Turkish national grid. By implementing the project, investors also aim to reduce dependency to the fossil fuels thereby reducing the sources of environmental pollution. In order to achieve the highest possible power output and the emission reductions associated with it; the project owner invested in state-of-the-art equipment and all the necessary assessments were carried out before the implementation.

Main goals of the Selale HEPP Project include;

- Utilization of the hydro power potential of Turkey in order to meet increasing electricity demand and maintain energy security.
- Reduction of GHG emissions through increasing share of renewable resources.

¹ Registered 2nd CP PDD, page 47

- Contribution to economic development by creating direct and indirect job opportunities during construction and operation phases.
- Reduction of import dependency on fossil fuel weighed electricity sector and diversify generation mix through use of local resources.
- Contribution to sustainable development through supporting local community and local economy.

Lastly, as is seen from the Milestone Table, no monitoring period has been indicated from the first crediting period. Because, the project could not receive the income from GS-VERs to support it financially during the first crediting period. After the coup attempt in 2016, the management of the company has changed, and government has impounded the assets of the company. Due to state of emergency and new governance structure commanded by the Savings Deposit Insurance Fund of Türkiye (TMSF), decision making process has been delayed except urgent cases. Therefore, project owner could not apply for verification or for the renewal of the crediting period.

A.2. Location of project

Selale hydropower plant is installed in Muradiye District in Van Province of Türkiye, with the purpose of contributing to the national economy the meeting the increased electricity demand.

GPS coordinates of the weir and powerhouse is given below.

	Longitude	Latitude
Bendimahi Weir	E 43° 45' 38"	N 39° 03' 01"
Powerhouse	E 43° 44' 38"	N 39° 01' 02"

The project is located in Muradiye District of Van Province in Turkey.



Figure 2. Location of the project on Turkish map

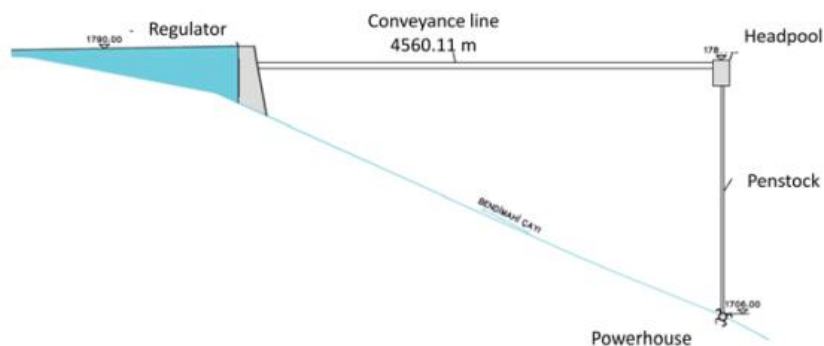


Figure 3. Layout of the project

A.3. Reference of applied methodology

The UNFCCC approved baseline and monitoring methodology applicable to this project is ACM0002: Grid-connected electricity generation from renewable sources - Version 21.0² was applied for the project activity. ACM0002 refers to the following tools:

- Tool 01: "Tool for the demonstration and assessment of additionality", Version 7.0.0³,

² <https://cdm.unfccc.int/UserManagement/FileStorage/ZPFJL010U2RYC6N3HASIXV7K84QBG9>

³ <https://cdm.unfccc.int/methodologies/PAmethodologies/tools/am-tool-01-v7.0.0.pdf>

- Tool 07: “Tool to calculate the emission factor for an electricity system”, Version 07.0⁴

A.4. Crediting period of project

This monitoring report is the first verification of the 2nd Crediting Period. This is the second crediting period. Selale HEPP started generating electricity on 25/03/2011. First crediting period was postponed by 1 year without any approval requirements as per Design Change Requirements, section 3.1.3 | Changes to the start date of the registered crediting period”. Therefore, the first crediting period was between 25/03/2012-24/03/2019. Hence, second crediting period start date is 25/03/2019 and the total length is 7 years. End date of crediting period is 24/03/2026. The second crediting period is between 25/03/2019-24/03/2026.

⁴ <https://cdm.unfccc.int/methodologies/PAmethodologies/tools/am-tool-07-v7.0.pdf>

SECTION B. IMPLEMENTATION OF PROJECT

B.1. Description of implemented project

The project activity generates greenhouse gas (GHG) emission reductions by avoiding CO₂ emissions from electricity generation by fossil fuel power plants connected to Turkish National Power Grid. Selale HEPP has a capacity of 13.650 MWm / 13.377 MWe, and is composed of Selale Regulator and Selale Powerhouse. The average annual generated energy of 27,672 MWh delivers a reduction in emissions of around 12,772 tCO₂e (tons of carbon dioxide equivalent) per annum. Total emission reduction is calculated as 17,567 tCO₂e. Total electricity generation value is 38,059 MWh for this monitoring period.

Main goals of the Selale HEPP Project include;

- Utilization of the hydro power potential of Turkey in order to meet increasing electricity demand and maintain energy security.
- Reduction of GHG emissions through increasing share of renewable resources.
- Contribution to economic development by creating direct and indirect job opportunities during construction and operation phases.
- Reduction of import dependency on fossil fuel weighed electricity sector and diversify generation mix through use of local resources.
- Contribution to sustainable development through supporting local community and local economy.

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

Project activity involves installation of a 13.377 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. In this scope, 3x(4.550 MWm/4.459 MWe) were installed. The commissioning date of these units is 25/03/2011. The project uses Orient horizontal axis generators with total electrical output capacity of 13.650 MWm / 13.377 MWe with the purpose of

contributing to the national economy the meeting the increased electricity demand. The project complies with the relevant regulations and laws in Türkiye.

Table 4. Technical Specifications of the turbines

Parameter	Value
Location:	On Bendimahı River Course, In Muradiye District of Van Province
Design Discharge:	19.00 m ³ /sec (6.33 m ³ /s Each)
Total Length Of Conveyance Line:	1,895 km Channel + 4,400 km Tunnel
Net Head:	48.3 m
Total Installed Capacity:	13.377 MWe
Number Of Units:	3 Each 4.55 MW
Turbine Type:	Francis Type – Horizontal Axis
Turbine Manufacturer:	Orient Engineering (China)
Generator Type:	Horizontal Axis Generators With 5.059 Kva Apparent Power,
Generator Manufacturer:	Orient Engineering (China)
Energy Transmission Line Capacity:	33 kV, 5 Km Transmission Line To Muradiye Substation
Number Of Penstocks:	3
Length Of Penstocks:	325 m each
Average Annual Power Generation:	56.22 GWh
Type Of Metering Devices	To Be Determined Later According To Local Regulations Of Energy Market Regulatory Authority (EMRA) Of Turkey.

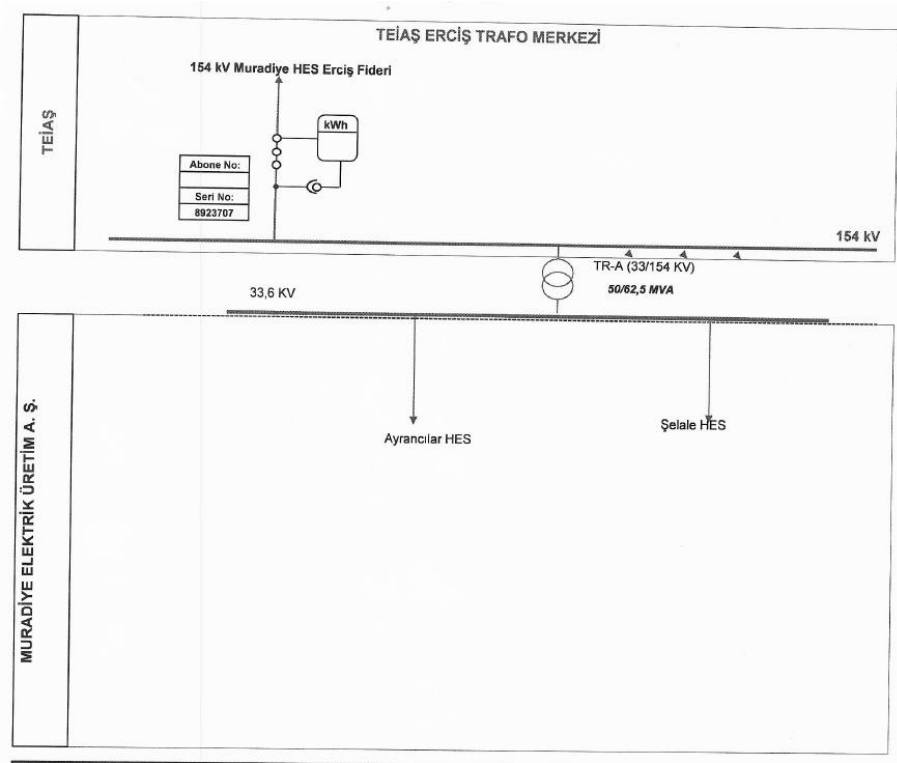


Figure 4. Diagram of the project including the meters, transformation center and the boundaries

There are one main meter and one spare meter. The meters are tested every 2 years by the grid operator according to the system use agreement, who is the sole responsible entity of the meters. If the test results are appropriate, the meters are calibrated before waiting for the due date, of 10 years.

Table 5. Meter Properties

	Meters used before 21/11/2019		Meters used after 21/11/2019	
	Main Meter	Spare Meter	Main Meter	Spare Meter
Brand	AKTARIS	AKTARIS	EMH	EMH
Type	SL7000	SL7000	LZQJ-XC	LZQJ-XC
Class	0.2S	0.2S	0.2S	0.2S
Serial No.	53099071	53099070	8923707	8923708
Date of calibration / First Index Protocol Date	2010, at the factory by the manufacturer		21/11/2019, at the factory by the manufacturer	
Date of testing	14/02/2011 21/12/2012 04/03/2014 20/09/2016 09/11/2017		04/10/2022 08/02/2024 ⁵	

B.1.1 Forward Action Requests

FAR 1: In-line with GS4GG Principles and Requirements, delay in the completion of re-validation beyond the last date of current certification cycle shall result in a reduction of any issuance of Certified Products and/or Impact Statements available during following certification cycle. Thus, PD cannot claim credits during the delay period from 25/03/2019 to 17/03/2023.

At the time of performance review for second crediting period, VVB shall check the start date of monitoring period in accordance to the date of the onsite verification date.

⁵ TEIAS Sayac Test Tutanakları 2024

Response: As per the rules, this monitoring period starts on 17/03/2023. The PD hasn't conducted any verification for the project activity to verify the actual start date of the second crediting period. As written in the Validation Report and the 2nd Crediting Period PDD, post the Turkish coup attempt in 2016, the management of the company changed, and the government impounded the assets of the company. Due to this state emergency, the project activity was unable to perform any verification in the first crediting period. The first submission date of the renewal of crediting period for this project was 17/03/2023. Thus, even though the start date of the RCP is 2019, due to the delay, monitoring period starts on 18/03/2023.

FAR 2: In-line with GS4GG Principles and Requirements, VVB and PP shall consider the following rules since the GS4GG Transition is concluded in 2021.

5.1.39: Transparent, annual update reports need to be provided for Projects that have achieved the Project Design Certification stage or have successfully transitioned to Gold Standard for the Global Goals. An annual report shall be submitted for each monitoring year by end of next calendar year for which verification is not completed. If a verification is in progress but not completed, then an Annual Report is still required by the end of calendar year.

Response: The latest annual report has been submitted on 01/01/2025. The first verification of 2nd Crediting Period is in progress.

5.1.50: Transitioning projects, maintaining their existing crediting cycle shall undergo Performance Certification no later than the first two years after project implementation or design certification, whichever is later, and once every three years after that, unless the Verifier provides a convincing case for less frequent visits as part of the Verification Report

Response: Renewal of the crediting period (applicable as design certification) has been completed in 2023. The project will undergo Performance Certification no later than two years after this date, and once every three years after that.

FAR 3: Since no revenue is realized from Gold Standard certification during first crediting period, this would be considered a FAR for the next Issuance as per GS4GG P&R para 4.1.52.

Response: Renewal of the crediting period (applicable as design certification) has been completed in 2023. The project will undergo Performance Certification no later than two years after this date, and once every three years after that. As written in the Validation Report and the 2nd Crediting Period PDD, post the Turkish coup attempt in 2016, the management of the company changed, and the government impounded the assets of the company. Due to this state emergency, the project activity was unable to perform any verification in the first crediting period. Further, the electricity generation has also been lower than the expected electricity generation, which has been verified through the annual electricity generation data provided by the PD and since the YEKDEM mechanism is no longer available for Selale HEPP (after 10 years), the electricity is also being sold to the grid at a fluctuating tariff rate. The project could not receive the income from GS-VERs to support it financially during the first crediting period. After the coup attempt in 2016, the management of the company has changed, and government has impounded the assets of the company. Due to state of emergency and new governance structure commanded by the Savings Deposit Insurance Fund of Türkiye (TMSF), decision making process has been delayed except urgent cases.

B.2. Post-Design Certification changes

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B.2.1. Temporary deviations from the approved Monitoring & Reporting Plan, methodology or standardized baseline

N/A

B.2.2. Corrections

It should be clarified that EPIAS records are used as the main source while TEIAS records are used for cross-checking to calculate electricity generation in this monitoring period.

B.2.3. Changes to start date of crediting period

N/A

B.2.4. Permanent changes from the Design Certified monitoring plan, applied methodology or applied standardized baseline

N/A

B.2.5. Changes to project design of approved project

N/A

SECTION C. DESCRIPTION OF MONITORING SYSTEM APPLIED BY THE PROJECT

Monitoring is a key procedure to verify the real and measurable emission reductions from the Selale HEPP project. To guarantee the proposed project's real, measurable and long-term GHG emission reductions, the monitoring plan is established. Net electricity generation are measured and recorded by both TEIAS and project owners for billing purposes therefore no new additional protocol are needed monitoring emission reduction. Power Plant Manager, are 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 are used for emission reduction calculations.

Generation data collected during crediting period are submitted to GTE Karbon Sürdürülebilir Enerji Eğitim Danışmanlık Ve Ticaret A.Ş. who are responsible for calculating the emission reduction subject to verification: Generation data are used to prepare monitoring reports which are 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.

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

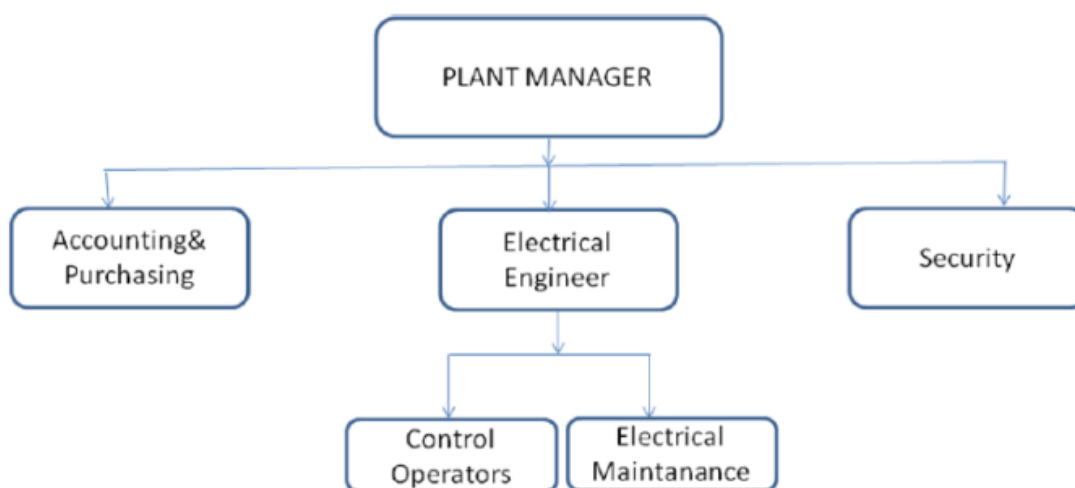


Figure 5. Operational structure of Selale HEPP

VER Team Members is expected to include;

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 are responsible for day-to-day operation and maintenance of the plant and equipment. All staff are trained and have certificated for working with high voltage equipment.

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

Installation of meter and data monitoring are carried out according to the regulations by TEIAS. Two metering devices (one of them used as spare) are used for monitoring the electricity generated by the power plant. Readings are done using main metering devices and spare metering device are used for comparison only. Data from metering devices are recorded by TEIAS monthly and form the basis for invoicing using the template formed by TEIAS which are used for cross checking of generation data. In addition to the two metering devices, generation of the Ayrancilar HEPP can be cross checked from TEIAS – EPIAS web site (<http://EPIAS.teias.gov.tr>) which is accessible using a password provided to electricity generation companies. Since the data in EPIAS web page shows the net electricity generated less transmission loss, in order to match the data, the figures taken from EPIAS web site must be multiplied by transmission loss factor of the grid. All data are kept for at least two years after the crediting period for QA/QC purposes.

The calibration and maintenance of the meters are carried out in line with the by law on Metering and Metering Devices⁶. Calibration of the meters are valid for 10 years based on the related regulation. The meters should also comply with EPDK regulations

⁶ <https://www.mevzuat.gov.tr/mevzuat?MevzuatNo=6381&MevzuatTur=7&MevzuatTertip=5>

which define the accuracy class of the meters as 0.2 or 0.5 depending on the capacity of the circuit.

In case of a major failure at both metering at the same time, electricity generation by the plant since the last measurement are 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.

The meters are tested every 2 years by the grid operator according to the system use agreement, who is the sole responsible entity of the meters. If the test results are appropriate, the meters are calibrated before waiting for the due date, of 10 years.

	Meters used before 21/11/2019		Meters used after 21/11/2019	
	Main Meter	Spare Meter	Main Meter	Spare Meter
Brand	AKTARIS	AKTARIS	EMH	EMH
Type	SL7000	SL7000	LZQJ-XC	LZQJ-XC
Class	0.2S	0.2S	0.2S	0.2S
Serial No.	53099071	53099070	8923707	8923708
Date of calibration / First Index Protocol Date	2010, at the factory by the manufacturer		21/11/2019, at the factory by the manufacturer	
Date of testing	14/02/2011 21/12/2012 04/03/2014 20/09/2016 09/11/2017		04/10/2022 08/02/2024 ⁷	

Both meters and their circuits were examined by TEİAŞ on 21/11/2019.^{8 9} An unconventional method of metering gross electricity generation and electricity consumption has been applied by Ayrancılar HEPP. Instead of continuously metering gross electricity generated and electricity consumed by Ayrancılar HEPP, the meters only measured gross electricity generation of Ayrancılar HEPP and Şelale HEPP, combined. Only data available from the project field is the combined gross electricity production of Ayrancılar HEPP and Şelale HEPP. This is due to the fact that Ayrancılar HEPP and Şelale HEPP are both connected to the same grid connection point and only

⁷ TEİAŞ Sayac Test Tutanakları 2024

⁸ Van TEİAŞ Ayrancılar HEPP Main Meter Examination Report

⁹ Van TEİAŞ Ayrancılar HEPP Spare Meter Examination Report

one meter is responsible to meter both plant's data. Ayrancılar HEPP was commissioned in August 2011 where Şelale HEPP was commissioned in March 2011.

The project owner states that a proportional constant can be used to calculate gross electricity production of Ayrancılar HEPP alone and this constant can be determined by using the ratio between plant capacity of Ayrancılar HEPP and plant capacity of Şelale HEPP. It is provided that project capacity of Ayrancılar HEPP and Şelale HEPP are 28,077 kW and 13,377 kW, respectively.

Hence, to calculate gross electricity production only of Şelale HEPP, the combined gross electricity production of the two plants is multiplied by the constant: $13,377/(28,077+13,377) = 0.3227$.

EPIAŞ values of the two plants are also combined. Both gross electricity generation and electricity consumption are provided by EPIAŞ. To find the portion that is due Şelale HEPP, EPIAŞ values are also multiplied by the proportional constant explained above. Summary of information provided by the project owner:

- Ayrancı HEPP and Şelale HEPP are connected to the same grid connection point and the metering is done with one meter.
- Gross electricity generation data provided by the project owner shows two separate gross electricity production data set one belonging to Ayrancılar HEPP and one belonging to Şelale HEPP. This does not indicate that the two different plants were metered separately. But instead, the total value was rationed between Ayrancılar HEPP and Şelale HEPP considering their plant capacities.
- EPIAŞ data stands for values for Ayrancılar HEPP and Şelale HEPP, combined. EPIAŞ metering system read values of Şelale HEPP up until August 2011 and after Ayrancılar HEPP was commissioned in August 2011, EPIAŞ metering system read values of Ayrancılar HEPP and Şelale HEPP combined under the name of "Ayrancılar HEPP".

Both Ayrancılar HEPP and Şelale HEPP operates under Muradiye Elektrik Üretim A.Ş.

SECTION D. DATA AND PARAMETERS

D.1. Data and parameters fixed ex ante or at renewal of crediting period

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, OM & BM values
Value(s) applied	CM = (BM x 0.75) + (OM x 0.25) As given by the Ministry of Energy and Natural Resources, built margin is 0.3680 and operating margin is 0.4616. (0.3680 x 0.75) + (0.7424 x 0.25) = 0.4616 tCO ₂ /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	-

D.2 Data and parameters monitored

SDG 13

Data/parameter	Emissions Reductions in tCO2
Unit	tCO2
Description	Reduction of CO2 emissions due to implementation of project activity
Source of data	Electricity generated by the project and Turkey's national electricity grid emission factor which is provided by Ministry of Energy and Natural Resources is used as reference in calculation of the emission reduction
Value(s) applied)	National electricity grid emission factor is 0.4616 tCO2/MWh. Annual emission reduction is 12,772 tonnes of CO2. Total emission reduction is 17,567 tonnes of CO2 for this monitoring period.
Choice of data or measurement methods and procedures	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. The Project contributes to SDG Target 13.3 through an amount of 17,567 tonnes of CO2e for this monitoring period, which represent direct and quantifiable impact on climate security.
Monitoring Frequency	Continuous measuring, monthly recording
QA/QC procedures	-
Purpose of data	To calculate the baseline emission value; and also to monitor the contribution to SDG 13 (Take urgent action to combat climate change and its impacts)
Additional Comment	-

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)	9 employments

Choice of data or measurement methods and procedures	Social Security Records (Provided social security records include both Ayrancılar HEPP and Selale HEPP projects' employees. Half of them is working at Selale HEPP Project)
Monitoring Frequency	Annually
QA/QC procedures	-
Purpose of data	To monitor the contribution to SDG 8
Additional Comment	-

Data/parameter	Qualitative of employment
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Unit	Number of trainings provided
Description	The project owner gave HSE trainings and/or vocational trainings (when needed)
Source of data	Training records, attendance lists and/or certificates ¹⁰
Value(s) applied)	Employers are generally taking HSE, EKAT Trainings, and Toolbox trainings. HSE is providing the profound information on health, safety, and environment. EKAT Training means providing the ability of working under high voltage. Toolbox trainings are generally online and informative training. These trainings inform employees about the emergency cases (like fire), ISO 9001, 14001, office rule, equipment safety. HSE Training: 9 employees (04/12/2023-05/12/2023) Toolbox Training: 9 employees (04/01/2024), (19/02/2024) (13/05/2024), (20/05/2024), (12/02/2023), (25/03/2023), (26/02/2024), (23/11/2023), (18/03/2023), (06/05/2024) EKAT Training: 6 employees have taken this training as they have to get to know that how to work safely under high voltage.
Choice of data or measurement methods and procedures	Training records, attendance lists and/or certifications are evaluated.
Monitoring Frequency	Annually
QA/QC procedures	-
Purpose of data	To assess the contribution to Principle 3
Additional Comment	-

¹⁰ Training Records

SDG 7

Data/parameter	$EG_{PJ, facility, y}$
Unit	MWh
Description	Quantity of net electricity generation supplied by the project plant to the grid in year y
Source of data	Data from metering devices are recorded by TEIAS monthly and form the basis for invoicing using the template formed by TEIAS which are used for cross checking of generation data. EPIAS Data is used as the main source.
Value(s) applied)	Total: 38,059 MWh Annually: 27,672 MWh/year
Choice of data or measurement methods and procedures	Generation data is recorded by two metering devices continuously. These records provide the data for the monthly invoicing to TEIAS. Each month, an officer from TEIAS and the manager/electricity technician of the plant record the readings and sign. This record forms the basis for monthly invoicing.
Monitoring Frequency	Continuous measurement at the site and daily and monthly recording were applied. The monthly records obtained from remote reading system of TEIAS were used for monitoring purposes. Data are cross checked with TEIAS records. EPIAS (formerly PMUM, changed to EPIAS, 2015) Data is used as the main source.
QA/QC procedures	Two meters (ISKRA MT830) back up each other. These meters are chosen according to national regulations and approved and sealed by TEIAS at startup of the plant. Maintenance and calibration of the metering devices are made by TEIAS periodically. In addition to invoices and metering devices, the electricity delivered to the grid can be cross checked through TEIAS web page (https://www.epias.com.tr/) using the ID and password of the project owner. All records are kept for at least two years as requested by the applied methodology.

Ayrancilar HEPP and Şelale HEPP are connected to the same electricity meters. Hence, their electricity generation data are read from one source. Their installed capacities are different, the ratio of their installed capacities are used to divide the electricity generation to each of the plants. It is not possible to monitor electricity generation values separately. Further explanation on metering of electricity generation is as follows:

- Instead of continuously metering gross electricity generated and electricity consumed by Ayrancilar HEPP, the meters only measured gross electricity generation of Ayrancilar HEPP and Şelale HEPP, combined. Only data available from the project field is the combined gross electricity production of Ayrancilar HEPP and Şelale HEPP. This is due to the fact that Ayrancilar HEPP and Şelale HEPP are both connected to the same grid connection point and only one meter is responsible to meter both plant's data.

- Hence, to calculate gross electricity production only of Ayrancilar HEPP, the combined gross electricity production of the two plants is multiplied by the constant:
 $13,377 / (28,077 + 13,377) = 0.3227$. Details are given in the excel sheet.

- EPIAŞ values of the two plants are also combined. Both gross electricity generation and electricity consumption are provided by EPIAŞ. To find the portion that is due Ayrancilar HEPP, EPIAŞ values are also multiplied by the proportional constant explained above.

Installed capacity of Ayrancilar HEPP: $3 \times 9.550 \text{ MWm} / 3 \times 9.359 \text{ MWe} = 28.650 \text{ MWm} / 28.077 \text{ MWe}$

Installed capacity of Şelale HEPP: $3 \times 4.550 \text{ MWm} / 3 \times 4.459 \text{ MWe} = 13.650 \text{ MWm} / 13.377 \text{ MWe}$

Total installed capacity = $42.300 \text{ MWm} / 41.454 \text{ MWe}$ The electricity generations for each plant is calculated as follows:

Generation of AYRANCILAR HYDROELECTRIC POWER PLANT

= (Total generation value x Installed capacity of Ayrancılar HEPP) / Total Installed Capacity

Generation of Selale HEPP

= (Total generation value x installed capacity of Selale HEPP) / Total installed capacity

Calculations have been shown in ER Excel Sheet.

Details of the meters:

	Meters used before 21/11/2019		Meters used after 21/11/2019	
	Main Meter¹	Spare Meter¹	Main Meter¹	Spare Meter¹
Brand	AKTARIS	AKTARIS	EMH	EMH
Type	SL7000	SL7000	LZQJ-XC	LZQJ-XC
Class	0.2S	0.2S	0.2S	0.2S
Serial No.	53099071	53099070	8923707	8923708
First Index Protocol / Date of calibration	2010, at the factory by the manufacturer		21/11/2019, at the factory by the manufacturer	
Date of Testing	14/02/2011 21/12/2012 04/03/2014 20/09/2016 09/11/2017		04/10/2022 08/02/2024	

Purpose of data

Baseline emission calculations

Additional Comment

-

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 map
Value(s) applied)	23,046 m ²
Choice of data or measurement methods and procedures	Measured from topographical surveys or maps
Monitoring Frequency	Once in each monitoring period
QA/QC procedures	-
Purpose of data	To measure area of the surface of the water. To be used in power density calculations.
Additional Comment	The project does not have a reservoir. There is an area of the surface of the water before water enters the plant.

D.3. Comparison of monitored parameters with last monitoring period

This project is not a community service project, thus this section is N/A.

D.4. Implementation of sampling plan

N/A

SECTION E. CALCULATION OF SDG IMPACTS

E.1. Calculation of baseline value or estimation of baseline situation of each SDG Impact

SDG 7: Affordable and Clean Energy

There is no clean energy generation for the baseline situation of the project site. The clean energy generated by the project is calculated based on the amount of electricity generated by the project per annum.

SDG 8: Decent Work and Economic Growth

There is no employment opportunity as the project was created within the project area and nearby settlements for baseline situation.

SDG 13: Climate Action

There is no similar activity to combat climate change on project site and nearby area for baseline situation. Therefore, emitted CO₂ would be 17,567 tCO₂ for the whole monitoring period (18/03/2023 – 31/07/2024).

Baseline emission is calculated according to the formula:

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

Where:

EGP_{J,y} = Quantity of net electricity generation that is produced and fed into the grid as a result of the implementation of the CDM project activity in year y (data is gathered from EPIAS Records as the main source and cross-checked via TEIAS Records)

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

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 0.3541 and operating margin is 0.7279.

$$(0.7279 \times 0.25) + (0.3541 \times 0.75) = 0.4616 \text{ tCO}_2/\text{MWh}$$

$$\text{BE}_{2023} = 12,204.99 \text{ MWh} \times 0.4616 \text{ tCO}_2\text{e}/\text{MWh} = 5,633 \text{ tCO}_2\text{e}$$

$$\text{BE}_{2024} = 25,854.92 \text{ MWh} \times 0.4616 \text{ tCO}_2\text{e}/\text{MWh} = 11,934 \text{ tCO}_2\text{e}$$

$$\text{Be}_{\text{total}} = 38,059 \text{ MWh} \times 0.4616 \text{ tCO}_2\text{e}/\text{MWh} = 17,567 \text{ tCO}_2\text{e}$$

Details are demonstrated in the ER Calculation Excel document. Rounddown function has been applied to the total and vintage VERs.

E.2. Calculation of project value or estimation of project situation of each SDG Impact

SDG 7: Affordable and Clean Energy

The project has been generated net 38,059 MWh clean electricity for the whole monitoring period while it is calculated as 27,672 MWh per annum.

SDG 8: Decent Work and Economic Growth

There are nine people employed in the project created within the project area and nearby settlements.

SDG 13: Climate Action

$$\text{ER}_y = \text{BE}_y - \text{PE}_y - \text{LE}_y$$

$$\text{BE}_y = \text{EGPJ},y \times \text{EFCM},y$$

$$\text{BE}_y = 38,059 \text{ MWh} \times 0.4616 \text{ tCO}_2/\text{MWh} = 17,567 \text{ tCO}_2$$

$$\text{ER}_y = 17,567 - 0 - 0 = 17,567 \text{ tCO}_2$$

The project has mitigated 17,567 tCO₂ in the whole monitoring period.

E.3. Calculation of 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". Alongside this, as per the methodology applied to this project, ACM0002 version 21, claims that no other leakage emissions are considered. The emissions potentially arising due to activities such as power plant construction and upstream emissions from fossil fuel use (e.g. extraction, processing, transport etc.) are neglected in para 6.1.¹¹

E.4. Calculation of net benefits or direct calculation for each SDG Impact

SDG	SDG Impact	Baseline estimate	Project estimate	Net benefit
13	Climate Action	17,567 tCO ₂	0 tCO ₂	17,567 tCO ₂
7	Affordable and Clean Energy	0 MWh	38,059 MWh	38,059 MWh
8	Decent Work and Economic Growth	0 people	9 people	9 people

E.5. Comparison of actual SDG Impacts with estimates in approved PDD

SDG	Values estimated in ex ante calculation of approved PDD for this monitoring period	Actual values ¹² achieved during this monitoring period
13	34,614.37 tCO ₂	17,567 tCO ₂
7	74,987.80 MWh	38,059 MWh

¹¹ <https://cdm.unfccc.int/UserManagement/FileStorage/ZPFJL01OU2RYC6N3HASIXV7K84QBG9> page 21

¹² Whenever emission reductions are capped, both the original and capped values used for calculations must be transparently reported. Use brackets to denote original values.

8	16 people	9 people
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E.5.1. Explanation of calculation of value estimated ex ante calculation of approved PDD for this monitoring period

Average yearly emission reductions have been calculated by proportioning expected annual generation to the days included by this monitoring period. Average yearly emission reduction has been multiplied by monitoring period (in days) to calculate estimated emission reduction.

2nd CP 1st Monitoring Period dates are from 18/03/2023 to 31/07/2024. Total number of days is 502.

(Expected annual generation x emission factor) x (days included / 365)

E.6. Remarks on increase in achieved SDG Impacts from estimated value in approved PDD

2nd CP 1st Monitoring Period dates are from 18/03/2023 to 31/07/2024. Both actual electricity generation and actual emission reduction values are lower than the estimated values. The value in the registered PDD is calculated ex-ante for duration of one complete year and assuming a certain incoming flow rate. Since the project is a HEPP, seasonal effects are significant on the monthly generation rates.

Ex-ante emission reduction was calculated as 34,614.37 tCO₂ for this monitoring period while actual reduction is found as 17,567 tCO₂ for this monitoring period. Ex-ante electricity generation was calculated as 74,987.80 MWh for this monitoring period while actual electricity generation is found as 38,059 MWh for this monitoring period. Therefore, - 49.2 % difference occurred between ex-ante and actual emission reductions and electricity generation. Both actual electricity generation and actual emission reduction values are lower than the estimated values.

% difference in EG: $[(38,059 - 74,987.80) / 74,987.80] \times 100 = - 49.2 \%$ which means the project generated 49.2 % less electricity than expected.

% difference in ER: $[(17,567 - 34,614.37) / 34,614.37] \times 100 = - 49.2 \%$ which means the project decreased CO₂ by 49.2 % less than expected.

SECTION F. SAFEGUARDS REPORTING

Principles	Mitigation Measures added to the Monitoring Plan
Principle 3. Community Health, Safety and Working Conditions	Turkey has ratified ILO convention 155 and about work safety and precautions. Thus, employees have been trained.
Principle 6.1 Labor Rights	The project developer ensures the training of workers. Different trainings have been given within the company.
Principle 8.1 Impact on Natural Water Patterns/Flows	Monitoring is done by Flow Monitoring Stations of DSI. Required actions have been taken according to the monitoring data collected by the stations. DSI monitors the flowrates and notifies the PP if there is any problem.
Principle 9.2 Vulnerability to Natural Disaster	The project structure is durable for the project location's conditions. The design was done considering the characteristics of the area. Many analyses such as construction reports, concrete mix calculation, contact water analysis, building permit were done.
Principle 9.4 Release of Pollutants	Project does not have any adverse impact on water quality and quantity. Domestic wastewater is collected and disposed to the sewage system. Domestic solid waste handled in accordance with related regulation (Regulation: Katı Atıkların Kontrolü Yönetmeliği, numbered 20814, dated 14.03.1991). All the other generated waste handled according to the national regulation "Turkish Water Pollution Control Regulation". Excavation was properly stored in designated areas and used for aff. The project does not have any point or fugitive emission and heating source emissions during operation other than an emergency diesel generator. Moreover, no mitigation measure is required for noise pollution due to related justification.
Principle 9.5 Hazardous and Non-hazardous Waste	Waste oil from equipment is collected properly in line with the relevant regulation and disposed via accredited abatement companies. Waste oil is disposed in line with regulation 34051 on control of waste oils. The plant does not use high amounts of oil, once the containers are full, waste oil is removed by an authorized company or municipality services. Residential wastes and solid wastes due to daily operation of the personnel are also stored in containers under confined conditions. Wastes are either collected by the local municipality or dumped to sites designated by the local authorities and the

Principle 9.10 High Conservation Value Areas and Critical Habitats	dated (2023) document is shared. Wastewater generated is collected in a septic tank and later is draught to the nearest sewage system by vacuum truck. As is indicated in the registered PDD (2nd CP), no mitigation measure is required in terms of plants as there are no endemic or protected plant species on the project site. To maintain fish migration, fish passage was built. Fish passages were designed in order to allow fish communities to pass through the river. The riverbed is protected by preserving and also planting new plants in order to prevent sedimentation.
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SECTION G. STAKEHOLDER INPUTS AND LEGAL DISPUTES

G.1. List all Inputs and Grievances which have been received via the Continuous Input and Grievance Mechanism together with their respective responses/mitigations.

Local stakeholders are welcome to communicate face-to face with the mukhtar or directly with the plant's staff. Also, they can use the logbook which was left at Van Province, Muradiye District (the closest to the project area), Kandahar Neighborhood mukhtar's (village head) office to submit their grievances. This logbook is checked regularly by the plant's staff. The project owner's contact information has been present with the mukhtar since the project start date. Stakeholders and the chief of the plant are always in communication, and they are able to give any comments at any time.

G.2. Report on any stakeholder mitigations that were agreed to be monitored.

No such demand was made in this monitoring period.

G.3. Provide details of any legal contest that has arisen with the project during the monitoring period

No legal contest had arisen with the project in this monitoring period.

Revision History

Version	Date	Remarks
1.1	14 October 2020	Hyperlinked section summary to enable quick access to key sections Improved clarity on Key Project Information Section for POA monitoring Forward action request section Improved Clarity on SDG contribution/SDG Impact term used throughout Clarity on safeguard reporting Clarity on design changes Leakage section added for VER/CER projects Addition of Comparison of monitored parameters with last monitoring period Provision of an accompanying Guide to help the user understand detailed rules and requirements
1.0	10 July 2017	Initial adoption