



**Verified Carbon
Standard**

MONITORING REPORT TITLE

Document Prepared by GAIA Climate Consultant

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1 PROJECT DETAILS

1.1 Summary Description of the Implementation Status of the Project

The Cevizlik Run-of-River-Hydroelectric Power Plant is located in the Eastern Blacksea Region of Turkey, within the province of Rize province. The project, which is comprised of the construction of a green field 92,96 MWm / 91,40 MWe run of river hydropower electricity plant (HEPP) located on the İyidere river.

The objective of the project is to generate electricity and supply it into the public grid. The main purpose of the project is to generate approximately 335 GWh/year of electricity to supply the national grid using a renewable resource and tapping the significant hydropower potential in the region. The power plant consists of 2 Francis turbines with the vertical axis with 51.21 MWm power each, cofferdam of upstream, penstock, energy transmission line, a head pond, a surge tank, and a power station. The turbine and generator manufacturer are Alstom. The manufacturer is a French company, acclaimed for its integrated power plants, power production services and air quality control systems. Alstom has been selected as the equipment provider because of its reliable quality products and technology, which is a grid friendly technology with low maintenance needs as well as low noise and low environmental impacts. The project was started the construction on 2 January 2008, the turbine started the commissioning 28 May 2010. There is no dam or any new reservoir formation that will have an impact on the project emissions within the monitoring period.

The project contributes positive environmental benefits as displacing the electricity generated by fossil fuel-fired power plants by utilizing renewable resources so as to avoid environmental pollution and GHG emissions. Thus, the project has a significant contribution to climate protection and to sustainable development in the region.

This monitoring period is from 1 July 2012 to 31 March 2018. During this monitoring period, the actualized net electricity generation is 1,520,652.74 MWh. The total emission reduction of this monitoring period is 850,041 tCO₂e.

Please see the vintage-based comparison of expected and achieved emission reduction for this monitoring period:

Vintage	Total Days	Expected amount of net GHG removals (t CO ₂ e)	Amount achieved during this monitoring period (tCO ₂ e)	Expected net electricity generation (MWh)	Amount achieved during this monitoring period (MWh)	Difference (%)
01/07/2012-31/12/2012	184	94,506	49,714	168,891.84	88,935.47	-47%
01/01/2013-31/12/2013	365	187,472	147,779	335,030,00	264,364.35	-21%
01/01/2014-31/12/2014	365	187,472	140,709	335,030,00	251,716.12	-25%
01/01/2015-31/12/2015	365	187,472	154,487	335,030,00	276,363.51	-18%
01/01/2016-31/12/2016	365	187,472	168,635	335,030,00	301,673.77	-10%
01/01/2017-31/12/2017	365	187,472	159,774	335,030,00	285,822.75	-15%
01/01/2018-31/03/2018	90	46,226	28,943	82,610.14	51,776.77	-37%
Total	2,099	1,078,090	850,041	1,926,651.97	1,520,652.74	-21%

Table 1: Ex-ante vs achieved emission reduction

Considering the difference between the amount achieved in this monitoring period and the ex-ante amount, lower than expected precipitation resulted in lower production.

The following table shows a full detail of the project's technical specifications:

Property	Unit	Amount
Catchment Area	km ²	790
Annual Average Precipitation	mm	1100
Average Discharge	m ³ /s	26,46
Design Discharge	m ³ /s	50
Type	-	Ogee shaped concrete Gravity
Crest Length	m	60
Crest Elevation	m	456
Thalweg Elevation	m	450
Foundation Elevation	m	444

Height above Thalweg	m	6
Height above Foundation	m	12
Flood Water Level	m	457.95
Q100	m ³ /s	557
Q500	m ³ /s	719.52
Flushing Gate		
Crest Elevation	m	450
Foundation Elevation	m	444
Crest Length	m	17
Number of Gates		3
Gate Size	m x m x m	3 x 2.50 x 4.00
Intake Structure Total Width	m	14
Settling Basin		
Length	m	64
Width	m	4 X 7
Settled Particular Size	mm	0.60
Regulation Pond Surface Area	m ²	14091
Regulating Pond Capacity Active Volume	m ³	200000
	m ³	173000
Headrace Tunnel		
Type		Horseshoe, concrete lined
Inner Diameter	m	4.00
Thickness of Concrete	m	0,40
Tunnel Capacity	m ³ /s	50,00
Headrace Tunnel Length	m	7981,485
Access Tunnel 1 Length	m	410

Access Tunnel 2 Length	m	545
Access Tunnel 3 Length	m	960
Access Tunnel 4 Length	m	250
Access Tunnel 5 Length	m	113,50
Surge Tank		
Type		Varying Cross Section
Top Elevation	m	476
Bottom Elevation	m	412,40
Max. Water Level	m	470.10
Minimum Water Level	m	420.39
Inner Diameter	m	12.00 (412,40~430.00 between elevation) 16.00 (430.00~476.00 between elevation)
Penstock		
Inner Diameter	m	3.40
Excavation Diameter	m	4.60
Average Steel Thickness	m	20
Length	m	348,63
Powerhouse		
Type		Underground
Height	m	30,70
Length	m	43,80
Width	m	16
Project Discharge	m ³ /s	50,00
Tailrace Elevation	m	226,90
Turbine		

Brand/Model		ALSTOM POWER- Vertical Francis Turbine
Serial No of Units		2060/2061
Turbine Axis Level	m	221,00
Turbine Type		Vertical Axis Francis
Gross Head	m	230,00
Net Head	m	200,60
Installed Capacity	MW	92,96
Unit Capacity	MW	51,21
Number of Units		2
Underground Powerhouse Access		
Type		Modified Horseshoe
Tunnel Size	m	5 x 6
Concrete Thickness	m	0,50
Tunnel Length	m	98,225
Energy Transmission Line		
Type	kV	154
Characteristics		2 x 954MCM
Power Transmission Line Length	km	21

Table 2: Technical specifications of the Project

1.2 Sectoral Scope and Project Type

The respective sectoral scope is scope 1: “Energy Industry – Renewable/Non-renewable Sources”. Installed capacity of the project is 91,40 MWe, thus it falls into a large-scale project activity.

The project is not a grouped project.

1.3 Project Proponent

Organization name	SANKO ENERJI SANAYI VE TICARET. A.S.
Contact person	Volkan Aktürk
Title	Strategy & Business Development Manager
Address	15 Temmuz Mah, Gülbahar Cad, No:43, 34212 Istanbul / Turkey
Telephone	+90 212 410 45 00
Email	VAkturk@sankoenerji.com.tr

1.4 Other Entities Involved in the Project

Organization name	GAIA Climate Consultant
Role in the Project	Project Coordinator
Contact person	Gamze Karaca
Title	Carbon Consultant
Address	Maslak Meydan Sk. No:1 Beybi Giz Plaza Kat:26 Maslak/Istanbul
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Email	gkaraca@gaiacclimate.com

1.5 Project Start Date

The project start date is 28/05/2010 which is the commissioning date of the project.

1.6 Project Crediting Period

The crediting period of the project begins with the commissioning of the plant. The Project's total crediting period is ten years renewable twice. The project started to generate electricity on 28/05/2010. Thus, the first crediting period shall last from the 28th of May 2010 until 27th of May 2020.

1.7 Project Location

The project is located in the Eastern Blacksea Region of Turkey, within the province of Rize province. The project is on the İyidere river. The project area is located 40° 50' 37"N -40° 28' 32" E coordinates. The following figures show the project's location.



Figure 1: Project Location¹

1.8 Title and Reference of Methodology

Approved consolidated baseline and monitoring methodology ACM0002: "Consolidated baseline methodology for grid-connected electricity generation from renewable sources, Version 10." was applied.² In addition, as referred in the methodology, "Tool to calculate the emission factor for an electricity system, Version 01.1."³ was applied. The project's additionality has been demonstrated using the version of "Tool for demonstration and assessment additionality" Version 05.2⁴

¹ Google Earth screenshot of the coordinates has been provided to the DOE.

² https://cdm.unfccc.int/filestorage/N/F/9/NF9EDA0V5K382HW0JR14GS7XYQUMCP/EB47_repan07_ACM0002_ver10.pdf?t=YWR8cWZneTh0fDDpc-QvteK06tLtkWE5Q9z4

³ <https://cdm.unfccc.int/methodologies/PAmethodologies/tools/am-tool-07-v1.pdf>

⁴ <https://cdm.unfccc.int/methodologies/PAmethodologies/tools/am-tool-01-v5.2.pdf>

1.9 Participation under other GHG Programs

The project has not been registered or seeking registration under other GHG programs.⁵

1.10 Other Forms of Credit

The project has not created another form of Credit.⁶

1.11 Sustainable Development

The project helps Turkey to stimulate and commercialise the use of grid-connected renewable energy technologies and markets. Furthermore, the project demonstrates the viability of grid-connected wind farms which can support improved energy security, improved air quality, alternative sustainable energy futures, improved local livelihoods and sustainable renewable energy industry development. The specific goals of the project are to:

SDG-7 Clean and Affordable Energy

The project contributes to the Sustainable Development Goal, Affordable and Clean Energy. During this monitoring period, the actualized net electricity generation is 1,520,652.74 MWh.

SDG-8 Decent Work and Economic Growth

The project contributes to the Sustainable Development Goal, Decent Work and Economic Growth. Employment opportunities were provided for 21 personnel during the operation phase of the project.

SDG-13 Climate Action

The project contributes to the Sustainable Development Goal, Climate Action. During this monitoring period, the actualized emission reduction is 850,041 tCO₂e.

2 SAFEGUARDS

2.1 No Net Harm

There isn't any negative environmental or socio-economic impact. Also, in line with Turkish environmental regulations, an "Environmental Impact Assessment (EIA) Report" had been carried out and EIA Positive Decision was approved by the Ministry of Environment and Forestry in 20/02/2009.⁷

⁵ The relevant declaration letter has been submitted to the DOE.

⁶ The relevant declaration letter has been submitted to the DOE.

⁷ Positive EIA Letter has been submitted to the DOE.

There is a packaged wastewater treatment plant for the treatment of domestic wastewater generated within the context of the project activity.⁸ The wastewater is discharged in accordance with Water Pollution Control Regulations.

2.2 Local Stakeholder Consultation

During the registration of this project, Local Stakeholder Consultation meeting was held on 16/03/2006 in the conference room of the culture building in İkizdere district of Rize province. The purpose of the meeting was to inform public and stakeholders about the plan and present and discuss social and environmental impacts of the project. Invitation process for local stakeholder meeting was followed and associations/governmental offices were invited by invitation letters or calling. Apart from this kind of invitation other stakeholders were invited by local announcements such as announcement done on village coffeehouse and in newspaper. In order to satisfy this requirement, announcements were published in two newspapers (Karadeniz Haber ve Vatan Gazetesi) -one national and one local- declaring the date, time, venue and topic of the meeting. All the aspects of the project including the socio-economic and environmental aspects were presented to the participants by a project developer representative and were discussed by the stakeholders. Clarifications were requested and the overall response to the project was encouraging and positive.

During this monitoring period, a site visit including the stakeholder engagement procedure was conducted on 03/12/2020. Nine people including the mukhtars of Güneyce and Gürdere villages, three local stakeholders, and power plant employees were interviewed. All of these people are from local villages around the plant. There were not any negative feedbacks on socio-economic and environmental issues by the locals. Since there were no negative feedbacks from the locals, there is no need to take any further action.

Also, mukhtars of Güneyce and Gürdere villages had already taken the contact information of the Plant Manager of the company so that the local stakeholders are able to reach Plant Manager whenever they have any complaints, suggestions, or ideas about the project. Since mukhtars are the head of the village, they are the main contact person between the project owner and the local stakeholders. Mukhtars make sure that there's continuous communication between the two parties. In addition, a Complaint and Request form is available on the Project site. Stakeholders convey their requests and objections to the project owner by phone or individual application.⁹ All applications are recorded via the form. Project manager checks the comments in the book on a regular basis, and records responses.

⁸ The wastewater package treatment plant photographic evidences have been provided to the DOE.

⁹ The Complaint and Request forms have been submitted to the DOE.

There is no update or any change to the project design after the registration of the project.

2.3 AFOLU-Specific Safeguards

N/A

3 IMPLEMENTATION STATUS

3.1 Implementation Status of the Project Activity

The project was started construction on 02.01.2008. The first unit started to commissioning on 28 May 2010. During the registration of the project, the project proponent was the AKIM ENERJI URETIMI SANAYI VE TICARET A.S (as project developer). Akim Enerji was taken with all its liabilities by SANKO ENERJI SANAYI VE TICARET. A.S. on 28/09/2012.¹⁰ Similarly, the shareholder structure was changed on 28/09/2012 and the Project has been transferred to SANKO ENERJI SANAYI VE TICARET A.S.

The sole Project Proponent is SANKO ENERJI SANAYI VE TICARET. A.S. In addition, the registration of the project was carried out by GAIA Carbon Finance. However, during the monitoring period, the name of the Carbon Consultant has changed to the GAIA Climate Consultant.

There was no event or situation that occurred, which may impact the applicability of the methodology within the monitoring period.

Milestone	Date
First VER consideration	July 23 rd 2004
Feasibility report	May 2005
Stakeholder consultation	March 16 th 2006
EIA approval (by the Ministry of Environment and Forestry)	July 24 2006
Contract signature for the electrical works	December 4 th 2006
Contract signature for the equipments	December 5 th 2006
First discussions with financial institutions	February 2006
First contacts with PDD consultants	October 2007
Loan signature	January 2008
Contract signature for the construction works	January 2 nd 2008
Contact with a PDD consultant	April 25 th 2008
Contact with a DOE	June 12 th 2008
Start of PDD elaboration	July 2008
Start of VER validation	November 2009
The commissioning of the power plant (Project start date)	29/05/2010
1 st Monitoring Period	01/07/2011-30/06/2012
2 nd Monitoring Period	01/07/2012-31/03/2018

¹⁰ The Turkish Trade Registry Gazette has been provided to the DOE.

Table 3: Project Timeline

3.2 Deviations

3.2.1 Methodology Deviations

No deviation in the methodology has been applied to the project activity during the monitoring period.

3.2.2 Project Description Deviations

There are no project description deviations applied during this monitoring period. Clarifications about the project owner and other organizations involved in the project are included in Section 3.1.

3.3 Grouped Projects

This is not a grouped project.

4 DATA AND PARAMETERS

4.1 Data and Parameters Available at Validation

Data / Parameter	$EG_{PJ,y}$
Data unit	MWh/yr
Description	Quantity of net electricity generation supplied by the project to the grid in year y.
Source of data	Validated VCS Project Description (Version 6) of the Project.
Value applied	335,030 MWh/yr
Justification of choice of data or description of measurement methods and procedures applied	Electricity meters.
Purpose of Data	Used for baseline emission calculation.
Comments	

Data / Parameter	Cap_{PJ}
Data unit	MW
Description	Installed capacity of the hydro power plant after the implementation of the project activity
Source of data	Validated VCS Project Description (Version 6) of the Project.
Value applied	92.96
Justification of choice of data or description of measurement methods and procedures applied	The installed capacity will be determined based on recognized standards.
Purpose of Data	Calculation of project emissions
Comments	

Data / Parameter	A_{PJ}
Data unit	m ²
Description	Area of the regulation pond measured in the surface of the water, after the implementation of the project activity. when is full
Source of data	Validated VCS Project Description (Version 6) of the Project.
Value applied	14,091
Justification of choice of data or description of measurement methods and procedures applied	Measured from topographical surveys, maps, satellite pictures, etc.
Purpose of Data	Calculation of project emissions
Comments	-

Data / Parameter	NCV_{i,y}
Data unit	TJ
Description	Heating values of fuels consumed in thermal power plants in Turkey by the electric utilities.
Source of data	TEIAS website "Heating Values of Fuels Consumed in Thermal Power Plants in Turkey by the Electric Utilities" 2006-2008: http://www.teias.gov.tr/istatistik2008/46.xls

Value applied	Detailed in Annex 4 in the Validated VCS Project Description (Version 6) of the Project.
Justification of choice of data or description of measurement methods and procedures applied	Data used is taken from the TEİAŞ website, which is the website of the Turkish Electricity Distribution Company. The data published on the TEİAŞ website is the most up-to date and reliable data available for the Turkish grid.
Purpose of Data	Used for baseline emission calculation.
Comments	

Data / Parameter	EF_{CO2,i,y}
Data unit	tCO2/GJ
Description	CO2 emission factor of fossil fuel type i in year y
Source of data	IPCC default values at the lower limit of the uncertainty at a 95% confidence interval as provided in table 1.4 of Chapter1 of Vol. 2 (Energy) of the 2006 IPCC Guidelines on National GHG Inventories.
Value applied	Detailed in Annex 4 in the Validated VCS Project Description (Version 6) of the Project.
Justification of choice of data or description of measurement methods and procedures applied	According to the “Tool to calculate the emission factor for an electricity system”, if values provided by the fuel supplier of the power plants in invoices or regional or national average defaults values are not available the IPCC default values at the lower limit of uncertainty must be used.
Purpose of Data	Used for baseline emission calculation.
Comments	

Data / Parameter	Electricity capacity additions
Data unit	-
Description	Power plants which are most recently taken into operation
Source of data	TEIAS website: http://www.teias.gov.tr/projeksiyon/KAPASITE%20PROJEKSIYONU%202005.pdf http://www.teias.gov.tr/projeksiyon/KAPASITE%20PROJEKSIYONU%202006.pdf http://www.teias.gov.tr/projeksiyon/KAPASITE%20PROJEKSIYONU%202007.pdf http://www.teias.gov.tr/projeksiyon/KAPASITEPROJEKSIYONU%202008.pdf

	IYONU2008.pdf http://www.teias.gov.tr/projeksiyon/KAPASITEPROJEKS IYONU2009.pdf
Value applied	Detailed in Annex 4 in the Validated VCS Project Description (Version 6) of the Project.
Justification of choice of data or description of measurement methods and procedures applied	TEIAS (Turkish Electricity Transmission Company) is the official source for this data, hence providing the most up-to date and accurate information available.
Purpose of Data	Used for baseline emission calculation.
Comments	

Data / Parameter	$\eta_{m,y}$
Data unit	%
Description	Average net energy conversion efficiency of power unit m in year y
Source of data	
Value applied	Detailed in Annex 4 in the Validated VCS Project Description (Version 6) of the Project.
Justification of choice of data or description of measurement methods and procedures applied	-
Purpose of Data	Used for baseline emission calculation.
Comments	-

Data / Parameter	$EF_{grid,Cmy}$
Data unit	tCO ₂ e/MWh
Description	Baseline emission factor: the combined emission factor of the project grid system." Tool to calculate the emission factor for an electricity system"
Source of data	Validated VCS Project Description (Version 6) of the Project.
Value applied	0.559

Justification of choice of data or description of measurement methods and procedures applied	Calculated as per ACM0002 with 3 years vintage data and option of ex ante calculation based on “50% of OM and 50% of BM values approach for the first crediting period”
Purpose of Data	Used for baseline emission calculation.
Comments	EFgrid,CMy value (0.559 tCO ₂ /MWh) is valid for the duration of the crediting period.

4.2 Data and Parameters Monitored

Data / Parameter	EG_{PJ,y}
Data unit	MWh
Description	Quantity of net electricity generation supplied by the project plant/unit to the grid in year y
Source of data	Main source is the monthly meter readings records (EPIAŞ data, also known as PMUM). Invoicing of the electricity production is carried out according to EPIAŞ data; thus, rendering the EPIAŞ data official source of electricity generation
Description of measurement methods and procedures to be applied	The net electricity generation supplied to the grid is measured continuously by meters (both main and spare) and recorded monthly.
Frequency of monitoring/recording	Annually

Value monitored	Vintage	Electricity supplied to the grid (MWh)	Electricity consumption from the grid (MWh)	Net electricity supplied to the grid [MWh]	
	01/07/2012-31/12/2012	89,251.05	315.58	88,935.47	
	01/01/2013-31/12/2013	264,919.82	555.47	264,364.35	
	01/01/2014-31/12/2014	252,329.12	613.00	251,716.12	
	01/01/2015-31/12/2015	276,977.15	613.64	276,363.51	
	01/01/2016-31/12/2016	302,289.66	615.89	301,673.77	
	01/01/2017-31/12/2017	286,388.86	566.11	285,822.75	
	01/01/2018-31/03/2018	51,933.95	157.18	51,776.77	
	Monitoring equipment	Meters are in compliance with the communiqué for Metering Devices to be used in Electricity Market. The specification of electricity meters are provided below:			
Name		Serial Number	Brand –Model	Date of Last Calibration	Transformer Information
Main Meter		53035222	ACTARIS-SL761A071	19/12/2017	TM1
Backup meter		53035224	ACTARIS-SL761A071	19/12/2017	TM1
Main Meter		53035223	ACTARIS-SL761A071	19/12/2017	TM2
Backup meter		53035225	ACTARIS-SL761A071	19/12/2017	TM2

	Accuracy class: Active 0.2S – Reactive 2 During this monitoring period five metering tests were performed on 09/09/2013, 29/09/2014, 29/09/2015, 26/09/2016 and 19/12/2017 respectively.¹¹ The main and back meters was changed on 24/09/2019. The features of the new electricity meters are provided below: <table><tr><th>Name</th><th>Serial Number</th><th>Brand –Model</th><th>Transformer Information</th></tr><tr><td>Main Meter</td><td>84260531</td><td>ITRON-SL761X071</td><td>TM1</td></tr><tr><td>Backup meter</td><td>84260532</td><td>ITRON-SL761X071</td><td>TM1</td></tr><tr><td>Main Meter</td><td>84260533</td><td>ITRON-SL761X071</td><td>TM2</td></tr><tr><td>Backup meter</td><td>84260534</td><td>ITRON-SL761X071</td><td>TM2</td></tr></table> Accuracy class: Active 2019/C-2– Reactive:2009/0.2S-2 The project’s electricity production is fed into the grid through the Kalkandere TM 154, kV.	Name	Serial Number	Brand –Model	Transformer Information	Main Meter	84260531	ITRON-SL761X071	TM1	Backup meter	84260532	ITRON-SL761X071	TM1	Main Meter	84260533	ITRON-SL761X071	TM2	Backup meter	84260534	ITRON-SL761X071	TM2
Name	Serial Number	Brand –Model	Transformer Information																		
Main Meter	84260531	ITRON-SL761X071	TM1																		
Backup meter	84260532	ITRON-SL761X071	TM1																		
Main Meter	84260533	ITRON-SL761X071	TM2																		
Backup meter	84260534	ITRON-SL761X071	TM2																		
QA/QC procedures to be applied	Measurements are undertaken using energy meters. - According to the Article 2 of the Communiqué of Meters in Electricity Sector¹²: ‘The meters to be used in the electricity market shall be compliant with the standards of Turkish Standards Institute or IEC and have obtained “Type and System Approval” certificate from the Ministry of Trade and Industry.’ Therefore, Ministry of Trade and Industry (Ministry) is responsible from control and calibration of the meters. - Paragraph b) of the Article 9 of the 'Regulation of Metering and Testing of Metering Systems' (Regulation) of Ministry states that: ‘ b) Periodic tests of meters of electricity, water, coal gas, natural gas and current and voltage transformers are done every 10 years.’ Therefore; periodic calibration of the meters will be done every 10 years. - As above mentioned, the data acquisition and management and quality assurance procedures that are anyway in place, no additional procedures have to be established for the monitoring plan. In addition to that the quantity of net electricity delivered to the grid will be cross checked with the meter reading records (OSF forms) provided to the company by TEIAS and internal reports provided to the head of the company by the plant manager. - The net electricity export/supplied to a grid is the difference between the measured quantities of the grid electricity export																				

¹¹ The metering test results have been submitted to the DOE.

¹² http://www.epdk.gov.tr/documents/elektrik/mevzuat/teblig/elektrik/sayaclar_hakkinda/Elk_Tblg_Sayaclar.doc

	and the import. Main source is the monthly meter readings records (EPIAŞ data, also known as PMUM). Data from remote automatic meter reading system (OSOS) is used for crosschecking. Invoicing of the electricity production is carried out according to EPIAŞ data; thus, rendering the EPIAŞ data official source of electricity generation.
Purpose of the data	Calculation of emission reductions
Calculation method	The net electricity is calculated by: a) Subtracting self-consumption value from gross generation value for each month to find the net electricity supplied to the grid. b) Adding up all monthly net electricity values to calculate the total net electricity supplied to the grid during the monitoring period. c) Multiplying the total net electricity value with the CM emission factor.
Comments	

Data / Parameter	Cap_{PJ}
Data unit	MW
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	The installed capacity will be determined based on recognized standards.
Frequency of monitoring/recording	Yearly
Value monitored	92.96 MWm/ 91,40 MWe (2 x 45,70MWe)
Monitoring equipment	The data is monitored from the electricity generation license which was granted by Energy Market Regulatory Authority. The company has not made any change on the project design up to know and therefore, there is no increase or decrease in the installed capacity of the power plant.
QA/QC procedures to be applied	-

Purpose of the data	Calculation of project emissions
Calculation method	-
Comments	

Data / Parameter	A_{PJ}
Data unit	m ²
Description	Area of the regulation pond measured in the surface of the water, after the implementation of the project activity. when is full
Source of data	Project site
Description of measurement methods and procedures to be applied	Measured from topographical surveys, maps, satellite pictures, etc.
Frequency of monitoring/recording	Yearly
Value monitored	14,091 m ²
Monitoring equipment	
QA/QC procedures to be applied	
Purpose of the data	Calculation of project emissions
Calculation method	Please see Appendix-I for the reservoir area calculation details. The reservoir area mentioned above (14,091 m ²) is the maximum reservoir area. This water level only occurs at the Q500 flood discharge.
Comments	Since there is no capacity increase, the same installed capacity during the registration is valid. Therefore, no annual electronic spreadsheet has been recorded for the area of the reservoir and the reservoir area corresponding to maximum operational level has been taken into consideration.

4.3 Monitoring Plan

The purpose of the monitoring plan is to ensure that the monitoring and calculation of emission reductions of the proposed Project within the crediting period are complete, consistent, clear and accurate. The project is operated by Sanko Enerji Sanayi Ve Ticaret. A.S. which ensures the overall site management in accordance with Turkish Laws and technology providers' guidelines.

The Project Proponent is responsible to implement the monitoring report according to the UNFCCC rules and procedures. According to the Turkish Law and Regulations, the methods of monitoring the net electricity fed to the grid and quality control and assures are explained below:

Monitoring data is collected in accordance with the agreement done between the project owner and Turkish Electricity Transmission Company (TEIAS) which provides the infrastructure for the connection to the national grid. The metering system is defined in the agreement as two groups: main meter and spare meter. The design of the metering system is checked and approved by TEIAS before commissioning of the plant. The technical specifications of the power meters should be in line with Measure and Metering Devices Regulation by Ministry of Industry and Trade. In addition, the Communiqué for Power Meters announced by Energy Market Regulations Authority (EMRA) requires all meters to be in line with either Turkish Standards Institution or International Electro technical Commissions Standards. The meters are placed at the point the electricity is fed to the grid and sealed on behalf of the both parties. This prevents any intervention and assures the accuracy and quality of the measurements. Concerning metering system accuracy, project participants have to comply with relevant national legislation According to b) paragraph of the 9th Article of the Regulation of Metering and Testing of Metering Systems “periodic tests of meters of electricity, water, coal gas, natural gas and current and voltage transformer are done every 10 years.

Data is stored electronically, during the crediting period and at least two years after the last issuance of credits for the wind farm project activity in the concerning crediting period. The Project Proponent is responsible for the storage of data received from the measuring devices.

The main and spare meter readings are recorded monthly-remote automatic meter reading system and cross-checked whether calibration is required. The capacity of the transmission line connected is medium voltage of 154 kVA, the accuracy class for power meters have been defined in the Communiqué for Power Meters as 0.2S class. The calibration will be implemented in accordance with the related standard procedures. The periodical maintenance is under the responsibility of TEIAS and has been fixed as once in 10 years as mentioned above. Since the meters are within TEIAS' province, TEIAS executes all the

procedures for handling non-conformities. Therefore, the Project Participant does not have any internal auditing for this purpose.

Operational and Management Structure

As described before, there are two main factors important for the calculation of emission reductions. The only relevant data that have to be monitored is only net electricity generation ($EG_{\text{facility},y}$) per year. Since project emission is zero no additional monitoring is required. The generation data are subject to the strict internal quality control systems of both parties.

The monthly meter reading documents are stored by Sanko Enerji Sanayi Ve Ticaret. A.S. and TEİAŞ. The settlement notification, which is issued by TEİAŞ and includes the meter reading data, is stored on a TEİAŞ file server and accessible for Sanko Enerji Sanayi Ve Ticaret. A.S. via a secured website. The meters themselves can always be read as plausibility check for verification. The other important parameter is the emission factor. It is approved according to strict quality control parameters from an independent external party. With this, no additional structures or processes have to be implemented to insure the availability and high quality of the necessary data for monitoring.

The Project Manager is responsible for all issues related to the project and operation of the plant. On the other hand, plant manager is responsible for daily operational processes of the plant, management of the plant personnel, and other technical and management issues for the plant. Electrical Engineers undertake the specific actions required by the monitoring plan, i.e. they measure the electricity generation, the electricity supplied to the Turkish grid by the power plant, the electricity imports and the amount of fuel consumed, if fuel is consumed. Mechanical Engineers ensure that all the instrumentations and devices to perform the monitoring work properly. Administrative Officer act as the point of contact for all employees, providing administrative support and managing their queries. In total, there are twenty one employees within the scope of the project. Roles and responsibilities have been summarized in the following chart.

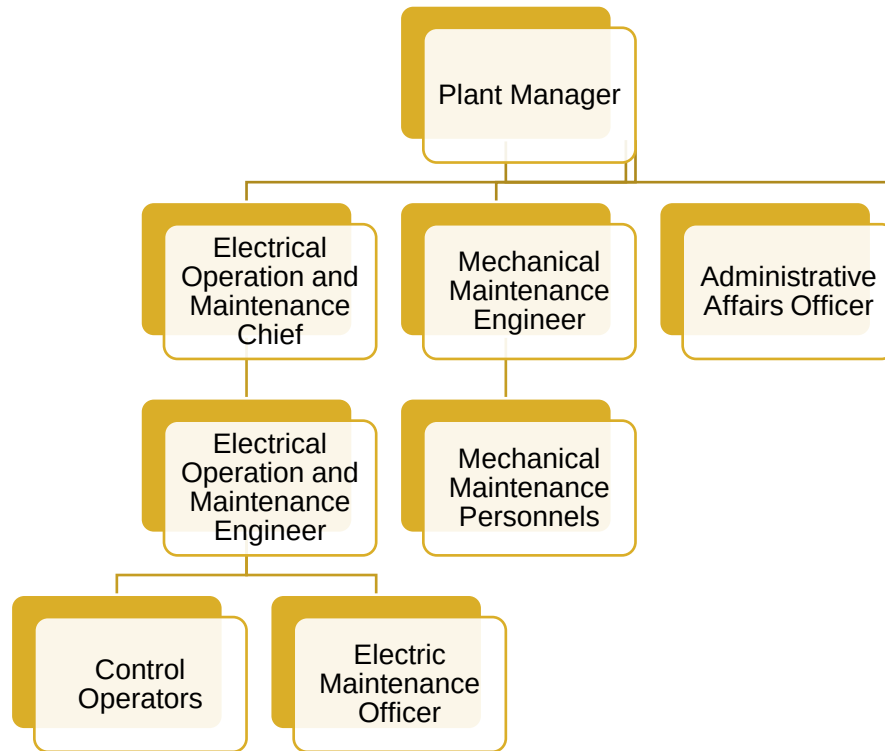


Figure 2: Operation and Management diagram

5 QUANTIFICATION OF GHG EMISSION REDUCTIONS AND REMOVALS

5.1 Baseline Emissions

$$BE_y = EG_{PJ,y} * EF_{grid,CM,y}$$

BE_y :Baseline emissions in year y (tCO₂)

$EG_{PJ,y}$:Quantity of net electricity generation that is produced and fed into the grid as a result of the implementation of the VCS project activity in year y (MWh/yr)

$EF_{grid,CM,y}$:Combined margin CO₂ emission factor for grid connected power generation in year y

$EF_{grid,CM,y}$ value is fixed as 0.559 tCO₂/MWh for during the crediting period.

Calculation of $EG_{PJ,y}$

Since the project activity is the installation of a new grid-connected renewable power plant/unit at a site where no renewable power plant was operated prior to the implementation of the project activity:

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

Where:

$EG_{PJ,y}$:Quantity of net electricity generation that is produced and fed into the grid as a result of the implementation of the VCS project activity in year y (MWh/yr)

$EG_{facility,y}$:Quantity of net electricity generation supplied by the project plant/unit to the grid in year y (MWh/yr).

5.2 Project Emissions

There is no project emission resulting from the reservoir area of the Project Activity as the power density of the project is greater than 10W/m². The power density of the project activity is calculated as follows:

Where:

PD = Power density of the project activity, in 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

$$Cap_{PJ} = 92,960,000 \text{ W}$$

$$Cap_{BL} = 0 \text{ (Justification: The project is a new hydro power plant)}$$

$$A_{PJ} = 14,090.49 \text{ m}^2$$

$$A_{BL} = 0 \text{ (Justification: The project is a new hydro power plant)}$$

$$\text{Therefore; } PD = (92,960,000 - 0) / (14,090.49 - 0) = 6,597.4 \text{ W/m}^2$$

Since the Power Density of the Project is greater than 10 W/m² PE_y=0

5.3 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 and transport).

These emissions sources are neglected. Therefore, the leakage from the Project Activity is zero.

5.4 Net GHG Emission Reductions and Removals

Also, according to ACM0002/Version 10 the emission reductions in year “y” should be calculated as the following formula:

$$ER_y = BE_y - PE_y - LE_y$$

Where:

ER_y = Emission reductions in year y (t CO₂/yr).

BE_y = Baseline emissions in year y (t CO₂/yr).

PE_y = Project emissions in year y (t CO₂/yr).

LE_y = Leakage emissions in year y (t CO₂/yr).

y = Refers to a given period

Since PE_y and LE_y are assumed to be 0, emission reductions are equal to baseline emissions.

Year	Baseline emissions or removals (tCO ₂ e)	Project emissions or removals (tCO ₂ e)	Leakage emissions (tCO ₂ e)	Net GHG emission reductions or removals (tCO ₂ e)
July 2012	14,701	0	0	14,701
August 2012	9,675	0	0	9,675
September 2012	6,551	0	0	6,551
October 2012	6,253	0	0	6,253

November 2012	7,721	0	0	7,721
December 2012	4,814	0	0	4,814
01/07/2012-31/12/2012	49,714	0	0	49,714
January 2013	4,404	0	0	4,404
February 2013	2,648	0	0	2,648
March 2013	11,898	0	0	11,898
April 2013	19,687	0	0	19,687
May 2013	34,471	0	0	34,471
June 2013	25,153	0	0	25,153
July 2013	12,355	0	0	12,355
August 2013	5,703	0	0	5,703
September 2013	7,990	0	0	7,990
October 2013	11,839	0	0	11,839
November 2013	5,762	0	0	5,762
December 2013	5,870	0	0	5,870
01/01/2013-31/12/2013	147,779	0	0	147,779
January 2014	4,801	0	0	4,801
February 2014	5,034	0	0	5,034
March 2014	9,069	0	0	9,069
April 2014	21,202	0	0	21,202

May 2014	32,077	0	0	32,077
June 2014	20,268	0	0	20,268
July 2014	7,632	0	0	7,632
August 2014	4,898	0	0	4,898
September 2014	5,446	0	0	5,446
October 2014	9,339	0	0	9,339
November 2014	11,382	0	0	11,382
December 2014	9,562	0	0	9,562
01/01/2014-31/12/2014	140,709	0	0	140,709
January 2015	6,502	0	0	6,502
February 2015	4,374	0	0	4,374
March 2015	6,763	0	0	6,763
April 2015	16,678	0	0	16,678
May 2015	35,014	0	0	35,014
June 2015	35,071	0	0	35,071
July 2015	15,123	0	0	15,123
August 2015	6,548	0	0	6,548
September 2015	3,662	0	0	3,662
October 2015	8,334	0	0	8,334
November 2015	8,707	0	0	8,707
December 2015	7,710	0	0	7,710

01/01/2015-31/12/2015	154,487	0	0	154,487
January 2016	7,116	0	0	7,116
February 2016	6,971	0	0	6,971
March 2016	12,551	0	0	12,551
April 2016	24,903	0	0	24,903
May 2016	19,501	0	0	19,501
June 2016	22,484	0	0	22,484
July 2016	24,410	0	0	24,410
August 2016	9,494	0	0	9,494
September 2016	11,415	0	0	11,415
October 2016	12,733	0	0	12,733
November 2016	9,891	0	0	9,891
December 2016	7,167	0	0	7,167
01/01/2016-31/12/2016	168,635	0	0	168,635
January 2017	5,332	0	0	5,332
February 2017	4,550	0	0	4,550
March 2017	10,328	0	0	10,328
April 2017	21,007	0	0	21,007
May 2017	36,409	0	0	36,409
June 2017	33,326	0	0	33,326
July 2017	13,768	0	0	13,768

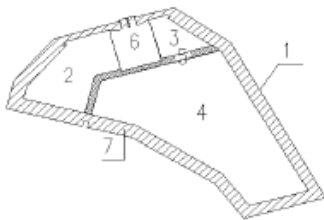
August 2017	6,215	0	0	6,215
September 2017	4,886	0	0	4,886
October 2017	9,641	0	0	9,641
November 2017	6,249	0	0	6,249
December 2017	8,065	0	0	8,065
01/01/2017-31/12/2017	159,774	0	0	159,774
January 2018	6,147	0	0	6,147
February 2018	6,741	0	0	6,741
March 2018	16,056	0	0	16,056
01/01/2018-31/03/2018	28,943	0	0	28,943
Total Sum 01/07/2012-31/03/2018	850,041	0	0	850,041

Table 4: Summary of Emission Reductions

APPENDIX 1:

Reservoir Area Calculation

Water Level
456.00 m

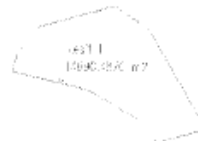


Section 1
Water Level
Area

(456.00-447.50)

8,5

14090,49

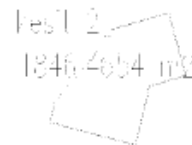


Section 2
Water Level
Area:

(447.50-440.50)

7

1846,465



Section 3
Water Level
Area:

(447.50-440.50)

7

601,4026



Section 4
Water Level
Area

(447.50-440.50~441.70)

6,4

6722,871



[illegible]