MONITORING REPORT TITLE

Document Prepared by GAIA Climate Consultant

Project Title	The Yokuslu- Kalkandere Hydroelectric Power Plant
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1 PROJECT DETAILS

1.1 Summary Description of the Implementation Status of the Project

The Yokuslu-Kalkandere Hydroelectric Power Plant (Kalkandere HEPP) consists of the construction of a greenfield one weir and two run-of-river hydroelectric power plants located in the Iyidere river basin, in Turkey's Eastern Blacksea Region.

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 180,480 MWh/year of electricity to supply the national grid using a renewable resource and tapping the significant hydropower potential in the region. Total installed capacity of the project is 41.19 MWm/40.24 MWe.[1] The plant has been designed to generate electricity by utilizing the 100.2 m of head between the tail water level of the upstream existing Cevizlik HEPP and the Incirlik HEPP project which is under project stage and is located downstream. The water diverted from the weir is transferred to "Kalkandere Power House" through a tunnel. The water is transferred to "Kizilagac Power House" through another tunnel. The total installed capacity of this plant is 5.2 MWe (2 x 2.60 MWe). 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 01 January 2012 to 31 August 2017. During this monitoring period, the actualized net electricity generation is 876,243.99MWh. The total emission reduction of this monitoring period is 489,818 tCO2e. Please see the vintage-based comparison of expected and achieved emission reductions for this monitoring period:

[1] The installed capacity figure is 35.04 MWe (3 x 11.68 MWe) for Kalkandere Power House and 5.2 MW (2 x 2.60 MWe). The total installed capacity of the project is 40.24 MWe. The Generation Licence has been submitted to the DOE.

Vintage	Total Days	Expected amount of net GHG removals (t CO_2e)	Amount achieved during this monitoring period (tCO2e)	Expected net electricity generation (MWh)	Amount achieved during this monitoring period (MWh)	Difference (%)
01/01/2012-31/12/2012	365	100,089	76,422	179,050.00	136,712.66	-%24
01/01/2013-31/12/2013	365	100,089	81,614	179,050.00	146,000.64	-%18
01/01/2014-31/12/2014	365	100,089	79,648	179,050.00	142,483.76	-%20
01/01/2015-31/12/2015	365	100,089	86,742	179,050.00	155,173.88	-%13
01/01/2016-31/12/2016	365	100,089	94,625	179,050.00	169,276.05	-%5
01/01/2017-31/08/2017	243	66,635	70,767	119,203.15	126,597.00	%6
Total	**2,068**	**567,080**	**489,818**	**1,014,453.15**	**876,243.99**	**-%14**

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	881.70
Average Discharge	m^3/s	29.52
Design Discharge	m^3/s	50
Regulator Crest Elevation	m	220.00
Regulator Thalweg Elevation	m	214.00
Flood Water Level	m	224.92
Flushing Gate		
Crest Elevation	m	214.00
Foundation Elevation	m	213.50
Crest Length	m	4.00

Number of Gates		2
Gate Size	m x m x m	3.00 x 3.00 x 4.00
Settling Basin		
Width	m	3.00 X 4.00
Settled Particular Size	mm	0.30
Settling Tunnel		
Type		underground tunnel
Number of Tunnels		3
Inner Diameter	m	4.00
Thickness of Concrete	m	0.50
Tunnel Capacity	m^3/s	16.67
Tunnel Length	m	50.00
Headrace Tunnel		
Type		Circular, concrete lined pressure tunnel
Inner Diameter	m	4.00
Thickness of Concrete	m	0,40
Tunnel Capacity	m^3/s	50,00
Headrace Tunnel Length	m	6,806.00
Surge Tank		
Type		Varying Cross Section
Top Elevation	m	238.50
Bottom Elevation	m	139.60
Max. Water Level	m	234.67
Minimum Water Level	m	190.25
Inner Diameter	m	4.00 - 16.00
Penstock		

Inner Diameter	m	3.60
Average Steel Thickness	m	15.50
Length	m	199.85
Powerhouse		
Length	m	46.00
Width	m	17.40
Project Discharge	m^3/s	50.00
Tailrace Elevation	m	119.00
Turbine Brand		VOITH
Turbine Type		Horizantal Axis Francis
Turbine Axis Level	m	117,50
Gross Head	m	100.20
Net Head	m	76.09
Installed Capacity	MWe	35.04
Unit Capacity	MWe	11.68
Number of Units		3
Serial No of Units		19743-19744-19745

Table 2: Technical specifications of the Project

Kizilagac Power Plant:

Property	**Unit**	**Amount**
Average Discharge	m^3/s	29.52
Design Discharge	m^3/s	50
Headrace Tunnel		
Type		Lined Pressure Tunnel
Inner Diameter	m	4.00
Thickness of Concrete	m	0.40

Tunnel Capacity	m^3/s	50,00
Headrace Tunnel Length	m	1,150.00
Surge Tank		
Type		Varying Cross Section
Top Elevation	m	126.00
Bottom Elevation	m	111.00
Max. Water Level	m	124.00
Minimum Water Level	m	111.90
Inner Diameter	m	4.00m (down), 22.00m (up)
Penstock		
Inner Diameter	m	3.80
Average Steel Thickness	mm	50.00
Length	m	55.00 (to manifold)
Powerhouse		
Length	m	34.00
Width	m	28.22
Project Discharge	m^3/s	50.00
Tailrace Elevation	m	102.60
Turbine Axis Level	m	98.00
Brand		Chongqing Water Turbine Works
Turbine Type		Vertical Kaplan Turbine
Maximum Head	m	14.45
Rated Head	m	12.00
Installed Capacity	MWe	5.20
Unit Capacity	MWe	2.60
Number of Units		2

Serial No of Units		2011-10/2011-11

Table 3: Technical specifications of the Kizilagac Power Plant

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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 41.19 MWm/40.24 MWe.

The project is not a grouped project.

1.3 Project Proponent

Organization name	SANKO ENERJI SANAYI VE TICARET. A.S.
Contact person	Ferudun İtergen
Title	Deputy General Manager
Address	15 Temmuz Mah, Gülbahar Cad, No:43, 34212 Istanbul / Turkey
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Email	ferudun.itergen@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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1.5 Project Start Date

The project start date is 30/12/2010 which the project commenced electricity production.

1.6 Project Crediting Period

The project crediting period is from 01 January 2011[2] to 31 December 2020. The Project's total crediting period is ten years renewable twice.

This monitoring period is covering its first crediting period. (01/01/2012-31/08/2017)

1.7 Project Location

The Project site is located in Turkey, in Eastern Black Sea, in the center of the Kalkandere district at western part of Rize province. It is also located in İyidere river basin. The project is in the order from headwaters thorough the downstream, Tozköy, Dereköy and Cevizlik dams basin. Power house of the project are located as following: Kalkandere Powerhouse between 40º 54' 26" North latitudes and 40º 25' 01" East longitudes.

[2] The first commissioning date of the project is December 30, 2010. However, in line with registered PDD and the first monitoring report, the crediting period is started on the first day of 2011.

Figure 1: Project's location

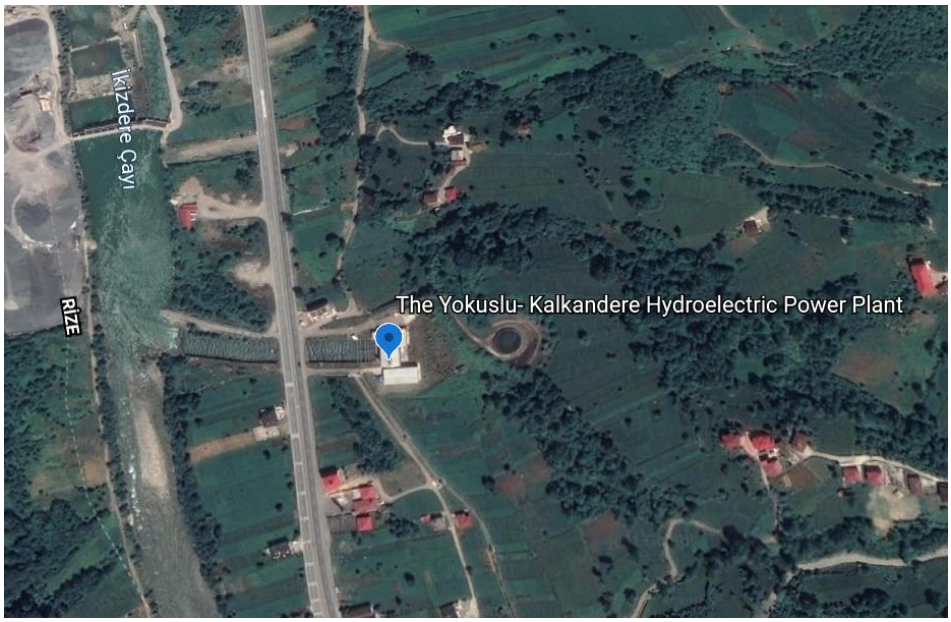

Figure 2: Project Location[3]

[3] Google Earth screenshot of the coordinates has been provided to the DOE.

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 12"[4] was applied. In addition, as referred in the methodology, "Tool to calculate the emission factor for an electricity system, Version 02"[5] was applied.

1.9 Participation under other GHG Programs

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

1.10 Other Forms of Credit

The project has not created another form of Credit.

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 876,243.99 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 23 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 489,818 tCO2e.

[4] https://cdm.unfccc.int/methodologies/DB/C505BVV9P8VSNNV3LTK1BP3OR24Y5L/view.html

[5] https://cdm.unfccc.int/methodologies/PAmethodologies/tools/am-tool-07-v2.pdf

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 06/11/2009.[6]

There is a packaged wastewater treatment plant for the treatment of domestic wastewater generated within the context of the project activity.[7] 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 21/05/2009 in the conference room of the culture building in Kalkandere Religious High School in 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 (Zümrüt Rize ve Dünya 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 23/12/2020. Seven people including mukhtars of Yokuşlu, Fındıklı and Hüseyinhoca villages and four local stakeholders 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. Locals stated that they are happy with the project since Kalkandere HEPP provided employment opportunities for local people. Since there were no negative feedbacks from the locals, there is no need to take any further action.

Also, mukhtars (head of the village) of Yokuşlu, Fındıklı and Hüseyinhoca villages had already taken the contact information of the Plant Manager of the company so that the local

[6] EIA Positive Decision has been submitted to the DOE.

[7] The wastewater package treatment plant photographic evidences have been provided to the DOE.

stakeholders can reach Plant Manager whenever they have any complaints, suggestions, or ideas about the project. Stakeholders convey their requests and objections to the project owner by phone or individual application.[8] Since mukhtars are the head of the villages, they are the main contact persons between the project owner and the local stakeholders. Mukhtars make sure that there's continuous communication between the two parties.

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 construction of the project started on 02.01.2009. The first unit of "Kalkandere Power House" started operation on 30 December 2010. The other two units were commissioned on 28 January 2011. The commissioning date of Kizilagac Power house is 30 December 2012.

During the registration of the project, the project proponent was the AKIM ENERJI URETIMI SANAYI VE TICARET A.S (as project developer). Akım Enerji was taken with all its liabilities by SANKO ENERJI SANAYI VE TICARET. A.S. on 28/09/2012.[9] 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. During the monitoring period, there was no event or situation that occurred, which may impact the applicability of the methodology.

Please see the table below for the important dates for the implementation of the project activity:

Milestone	Date
First VER consideration	July 23rd 2004
First Feasibility report	October 2004
First contacts with PDD consultants	October 2007
Last Feasibility report	November 2007
EIA is not required decision	November 23rd 2007
Contact with a PDD consultant	April 25th 2008

[8] The Complaint and Request forms have been submitted to the DOE.

[9] The Turkish Trade Registry Gazette has been provided to the DOE.

Contact with a DOE	June 1st , 2008
First discussions with financial institutions	September 2008
Investment Decision	October 10th 2008
Contract signature for the construction works of Kalkandere	January 2nd 2009
Contract signature for the electromechanical equipments Contract signature for electrical works	May 7th 2009
Stakeholder consultation	June 20th 2009
EIA approval (by the Ministry of Environment and Forestry)	November 06th, 2009
Commissioning of the first unit of Kalkandere power plant	December 30th, 2010
Project start date	January 1st, 2011
Commissioning of the other two units of Kalkandere power plant	January 28th, 2011
Commissioning of the Kizilagac power plant	30/12/2012
1st Monitoring Period	01/01/2011-31/12/2011
2nd Monitoring Period	01/01/2012-31/08/2017

Table 4: 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

The project activity was originally planned with a 42.33 MWe installed capacity. The total installed capacity was changed and decided to install as 40.24 MWe Kalkandere HEPP.[10]

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	**$EG_{facility,y}$**
Data unit	MWh/yr

[10] The current Generation Licence and Provisional Acceptance Protocol have been submitted to DOE.

Description	Quantity of net electricity generation supplied by the project to the grid in year y.
Source of data	Validated VCS Project Description (Version 8) of the Project.
Value applied	179,050 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	MWe
Description	Installed capacity of the hydro power plant after the implementation of the project activity
Source of data	Validated VCS Project Description (Version 8) of the Project.
Value applied	42.33
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 8) of the Project.
Value applied	2,205
Justification of choice of data or description of measurement	Measured from topographical surveys, maps, satellite pictures, etc.

methods and procedures applied	
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 5 in the Validated VCS Project Description (Version 8) 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	Values are given in Tcal and where converted using to TJ using a conversion factor of 4.1868TJ/Tcal.

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 Chapter 1 of Vol. 2 (Energy) of the 2006 IPCC Guidelines on National GHG Inventories.
Value applied	Detailed in Annex 5 in the Validated VCS Project Description (Version 8) 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/KAPASITEPROJEKSIYONU2008.pdf http://www.teias.gov.tr/projeksiyon/KAPASITEPROJEKSIYONU2009.pdf
Value applied	Detailed in Annex 5 in the Validated VCS Project Description (Version 8) 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	$\eta_{m,y}$
Data unit	%
Description	Average net energy conversion efficiency of power unit m in year y
Source of data	UNFCC web site: “Tool to calculate the emission factor for an electricity system”. Annex 1.
Value applied	Detailed in Annex 5 in the Validated VCS Project Description (Version 8) 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	No official efficiency values based on each power plant or each fuel type is available in Turkey Most natural gas power plants in Turkey are combined cycle, most coal power plants operate sub-critical and most liquid fuel power plants adopt an open cycle technology.

Data / Parameter	**$EF_{grid,Cm}$**
Data unit	tCO2e/MWh
Description	Combined margin CO2 emission factor for grid connected power generation in year y calculated using the latest version of the "Tool to calculate the emission factor for an electricity system"
Source of data	Validated VCS Project Description (Version 8) 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	$EF_{grid,CM}$ value (0.559 tCO2/MWh) is valid for the duration of the crediting period.

4.2 Data and Parameters Monitored

Data / Parameter	**$EG_{facility,y}$**
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 (EPİAŞ data, also known as PMUM). Invoicing of the electricity production is carried out according to EPİAŞ data; thus, rendering the EPİAŞ data official source of electricity generation
Description of measurement methods and	The net electricity generation supplied to the grid is measured continuously by meters (both main and spare) and recorded monthly.

procedures to be applied	
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]
01/01/2012-31/12/2012	136,911.12	198.46	136,712.66
01/01/2013-31/12/2013	146,236.13	235.49	146,000.64
01/01/2014-31/12/2014	142,711.89	228.13	142,483.76
01/01/2015-31/12/2015	155,378.38	204.50	155,173.88
01/01/2016-31/12/2016	169,416.48	140.43	169,276.05
01/01/2017-31/08/2017	126,721.73	124.73	126,597.00
Total (01/01/2012-31/08/2017)	877,375.33	1,131.74	876,243.99

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	Transformer Information
Main Meter	9674574	EMH-LZQJ-XC	TM1
Backup meter	9674574	EMH-LZQJ-XC	TM1

Accuracy class: C-1S

During this monitoring period, five metering tests were performed on 09/09/2013, 29/09/2014, 29/09/2015, 26/09/2016 and 08/11/2017, respectively.[11]
The main and back meters were changed on 10/08/2020. The features of the changed electricity meters are provided below:

Name	Serial Number	Brand –Model	Date Of Last Calibration
Main Meter	53087889	ACTARIS (SL761A071)	08/11/2017
Backup meter	53087890	ACTARIS (SL761A071)	08/11/2017

Accuracy class: Active 0.2S – Reactive 2
Since Kızılağaç power plant is under the same license as Kalkandere, the energy produced is transferred to the system through the same meters. A separate meter has not been installed in the Kızılağaç power plant.

QA/QC procedures to be applied

Measurements are undertaken using energy meters.

- According to the Article 2 of the Communiqué of Meters in Electricity Sector[12]: '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

[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

	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 and the import. Main source is the monthly meter readings records (EPİAŞ 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 EPİAŞ data; thus, rendering the EPİAŞ 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	40.24 MWe (3*11.68+2*2.60MWe)

Monitoring equipment	The data is monitored from the electricity generation license which was granted by Energy Market Regulatory Authority.
QA/QC procedures to be applied	-
Purpose of the data	Calculation of project emissions
Calculation method	The installed capacity figure is 35.04 MWe (3x11.68 MWe) for Kalkandere Power House and 5.20 MW (2 x 2.60 MWe). The total installed capacity of the project is 40.24MWe.
Comments	The current Generation Licence and turbine specification documents have been provided to the DOE.

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	11,442 m^2
Monitoring equipment	Measured from topographical surveys, maps, satellite pictures, etc
QA/QC procedures to be applied	
Purpose of the data	Calculation of project emissions
Calculation method	The reservoir area mentioned above (11,442 m^2) is the maximum reservoir area at 224.92 m altitude. This water level only occurs at the Q500 flood discharge. The reservoir area was calculated with using Autocad programs. The reservoir area map has been provided to the DOE.

Comments	-

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. 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.

Data will be 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 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.

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 ($EG_{facility,y}$) 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 will 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 acts as the point of contact for all employees, providing administrative support and managing their queries. In total, 23 employees are working for the Project Activity. Roles and responsibilities have been summarized in the following chart.

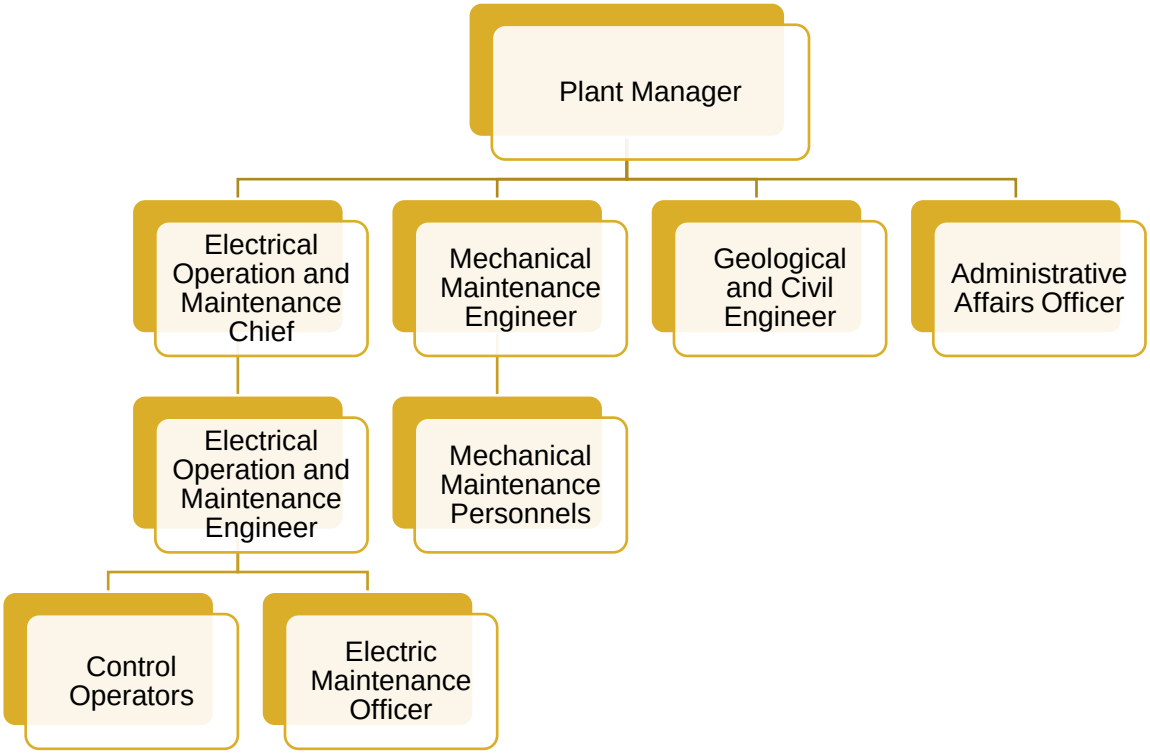

Figure 3: Operation and Management diagram

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/m^2. The power density of the project activity is calculated as follows:

Where:

PD = Power density of the project activity, in W/m^2

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

CapBL = 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 (m^2)

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 (m^2) For new reservoirs, this value is zero

Cap_{PJ} = 40.240.000 W

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

A_{PJ} = 11,442 m^2

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

Therefore; PD = (40.240.000 – 0)/(11,442 – 0) = 3,517 W/m^2

Since the Power Density of the Project is greater than 10 W/m^2 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 12 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_2e)	Project emissions or removals (tCO_2e)	Leakage emissions (tCO_2e)	Net GHG emission reductions or removals (tCO_2e)
January 2012	1,531	0	0	1,531
February 2012	2,064	0	0	2,064
March 2012	3,517	0	0	3,517
April 2012	13,143	0	0	13,143
May 2012	15,801	0	0	15,801

June 2012	13,241	0	0	13,241
July 2012	7,189	0	0	7,189
August 2012	5,450	0	0	5,450
September 2012	3,853	0	0	3,853
October 2012	3,378	0	0	3,378
November 2012	4,272	0	0	4,272
December 2012	2,984	0	0	2,984
Total 2012	**76,422**	**0**	**0**	**76,422**
January 2013	2,943	0	0	2,943
February 2013	1,559	0	0	1,559
March 2013	7,383	0	0	7,383
April 2013	10,444	0	0	10,444
May 2013	15,991	0	0	15,991
June 2013	12,521	0	0	12,521
July 2013	6,978	0	0	6,978
August 2013	3,340	0	0	3,340
September 2013	5,498	0	0	5,498
October 2013	7,598	0	0	7,598
November 2013	3,456	0	0	3,456
December 2013	3,902	0	0	3,902

Total 2013	**81,614**	**0**	**0**	**81,614**
January 2014	3,097	0	0	3,097
February 2014	3,262	0	0	3,262
March 2014	5,459	0	0	5,459
April 2014	10,991	0	0	10,991
May 2014	15,514	0	0	15,514
June 2014	10,847	0	0	10,847
July 2014	4,813	0	0	4,813
August 2014	3,171	0	0	3,171
September 2014	3,555	0	0	3,555
October 2014	5,542	0	0	5,542
November 2014	7,279	0	0	7,279
December 2014	6,118	0	0	6,118
Total 2014	**79,648**	**0**	**0**	**79,648**
January 2015	4,537	0	0	4,537
February 2015	2,974	0	0	2,974
March 2015	4,360	0	0	4,360
April 2015	9,950	0	0	9,950
May 2015	16,500	0	0	16,500
June 2015	16,516	0	0	16,516
July 2015	8,855	0	0	8,855

August 2015	4,423	0	0	4,423
September 2015	2,278	0	0	2,278
October 2015	6,031	0	0	6,031
November 2015	5,434	0	0	5,434
December 2015	4,884	0	0	4,884
Total 2015	**86,742**	**0**	**0**	**86,742**
January 2016	5,614	0	0	5,614
February 2016	6,030	0	0	6,030
March 2016	7,075	0	0	7,075
April 2016	12,308	0	0	12,308
May 2016	7,927	0	0	7,927
June 2016	9,571	0	0	9,571
July 2016	12,335	0	0	12,335
August 2016	5,781	0	0	5,781
September 2016	7,462	0	0	7,462
October 2016	8,399	0	0	8,399
November 2016	6,661	0	0	6,661
December 2016	5,463	0	0	5,463
Total 2016	**94,625**	**0**	**0**	**94,625**
January 2017	3,594	0	0	3,594

February 2017	3,722	0	0	3,722
March 2017	7,081	0	0	7,081
April 2017	11,572	0	0	11,572
May 2017	17,221	0	0	17,221
June 2017	15,795	0	0	15,795
July 2017	7,744	0	0	7,744
August 2017	4,039	0	0	4,039
Total 2017 Vintage (01/01/2017-31/08/2017)	**70,767**	**0**	**0**	**70,767**
Total Sum (01/01/2012-31/08/2017)	**489,818**	**0**	**0**	**489,818**

Table 5: Summary of Emission Reductions