MONITORING REPORT OF AYDIN SALAVATLI DORA-1 GEOTHERMAL POWER PLANT

Document Prepared By South Pole Carbon Asset Management Ltd.

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CONTENTS

1 PROJECT DETAILS 3

1.1 Summary Description of the Implementation Status of the Project 3

1.2 Sectoral Scope and Project Type 3

1.3 Project Proponent 4

1.4 Other Entities Involved in the Project 4

1.5 Project Start Date 4

1.6 Project Crediting Period 4

1.7 Project Location 5

1.8 Title and Reference of Methodology 5

1.9 Participation under other GHG Programs 6

1.10 Other Forms of Credit 6

1.11 Sustainable Development Contributions 6

2 SAFEGUARDS 8

2.1 No Net Harm 8

2.2 Local Stakeholder Consultation 8

2.3 AFOLU-Specific Safeguards 8

3 IMPLEMENTATION STATUS 8

3.1 Implementation Status of the Project Activity 8

3.2 Deviations 10

3.3 Grouped Projects 10

4 DATA AND PARAMETERS 10

4.1 Data and Parameters Available at Validation 10

4.2 Data and Parameters Monitored 13

4.3 Monitoring Plan 15

5 QUANTIFICATION OF GHG EMISSION REDUCTIONS AND REMOVALS 16

5.1 Baseline Emissions 16

5.2 Project Emissions 18

5.3 Leakage 20

5.4 Net GHG Emission Reductions and Removals 20

APPENDIX 1: <EMPLOYEE LIST> 22

1 PROJECT DETAILS

1.1 Summary Description of the Implementation Status of the Project

MENDERES Geothermal Elektrik Uretim A.S, (hereafter referred to as "the Project Owner") is the owner and the license holding company for the grid connected 7.951 MW Aydin Salavatli Dora-I Geothermal Power Plant.

The company has been established in 1999 and is headquartered in Aydın. It was set up as an investment company to provide electricity to both facilities within the MB Holding and other industrial complexes through the generation of electric power from geothermal energy. The company was established as a "generation company" in accordance with the terms and conditions stated in the Electricity Market Licensing Regulation published in the Official Gazette dated 04.08.2002, numbered 248336. The Project Owner continues to invest in the renewable energy sector.

The project activity aims to generate electricity from geothermal energy at a heat between 78°C and 170°C. The geothermal fluid is pumped up to the surface through production wells located in the "Aydın, Sultanhisar-Salavatlı geothermal field".

The thermal fluid is passed through a heat exchanger and the heat from the fluid is transferred to a secondary fluid - hydrocarbon. The secondary fluid is vaporized to generate electricity via the turbine and the generator. After having passed the heat exchanger, the geothermal fluid drops to 78°C and is re-injected back to the reservoir via a re-injection well. The production cycle is closed due to complete re-injection of the geothermal brine; thus avoiding any adverse effects to the environment and the performance parameters of the geothermal reservoir. The inhibitor and the dosing pump installed at the well prevent the fluid from causing corrosion and silica sediment deposits.

The first drilling activities as part of the project assessment had been started in 2003. Construction was initiated close to the city of Aydın in the village of Salavatlı almost two years later in May 2005 and had been taken one year.

The Project commissioned on 10/05/2006 and the first emission reduction credit period is from 01/07/2008 to 30/06/2018. The second credit period is from 01/07/2018 to 30/06/2028.

This is the 6th monitoring period, from 01/11/2017 to 31/12/2021. This monitoring report covers two crediting period. 01/11/2017 to 30/06/2018 belongs to the 1st crediting period and 01/07/2018 to 31/12/2021 belongs to the 2nd crediting period. The total GHG emission reductions generated in this monitoring period are 35,854 tCO_2e.

1.2 Sectoral Scope and Project Type

According to UNFCCC sectoral scopes definition for CDM projects, the Project Activity is included in the Sectoral Scope 1, category "Energy industries (renewable-/ non-renewable sources)".

The project is a single Greenfield investment and is not part of a project group or bundle.

1.3 Project Proponent

Organization name	**Menderes Geothermal Elektrik Uretim A.S. (MEGE)**
Contact person	Murat Haluk Tufekcioglu
Title	Manager
Address	No:7/1, Aydın, 09100, Turkey
Telephone	/
Email	egeenerji@mb.com.tr

Organization name	**South Pole Carbon Asset Management Ltd. (SPCM)**
Contact person	Murat Haluk Tufekcioglu
Title	CEO
Address	No.1, Technoparkstr, Zurich, 8005, Switzerland
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1.4 Other Entities Involved in the Project

N/A

1.5 Project Start Date

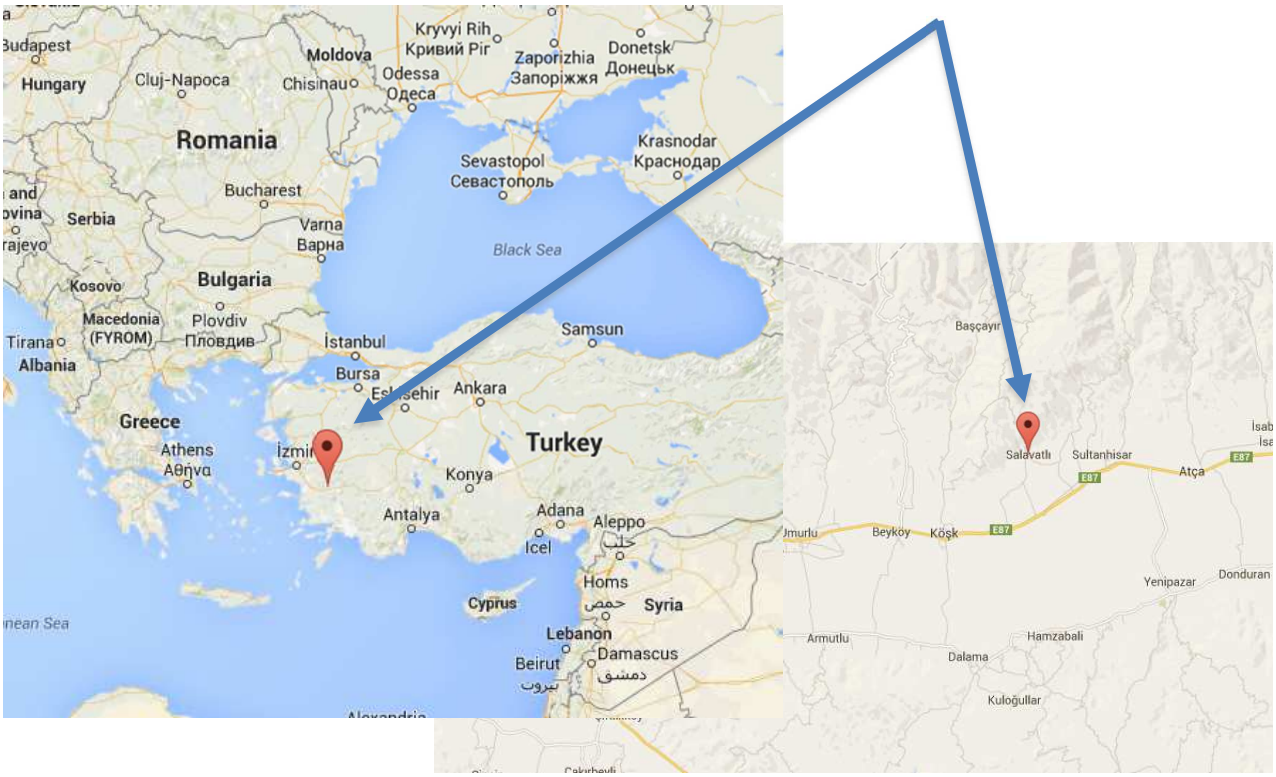
This project starts on 10/05/2006, which is the date that the electricity was delivered to national grid (the project began generate GHG emission reductions).

1.6 Project Crediting Period

The first crediting period is 10 years, from 01/07/2008 to 30/06/2018. The second crediting period is 10 years, from 01/07/2018 to 30/06/2028. This monitoring report covers the period from 01/11/2017-31/12/2021 (both days included). This monitoring report covers two crediting period. 01/11/2017 to 30/06/2018 belongs to the 1st crediting period and 01/07/2018 to 31/12/2021 belongs to the 2nd crediting period.

1.7 Project Location

The Dora-I power plant has been constructed in the West of the village Salavatlı, which is located in the Northeast of the city of Aydın. It was built in a free area in the marginal lands of the village and covers an area of 25'000 square meter including two sides. One of them hosts the production wells named AS-1 and ASR-2. They are connected to the electricity generation facility through 900-meter-long isolated tubes in the case of well AS-1 and 100 meter for the ASR-2 well. The re-injection well, named AS-2, is located right at the generation facility. The geographical location of the Project is 37°53'22 85 N and 28°06'33. 50 E. Following picture 1 shows the location of the project.



Picture 1. Location of the project.

1.8 Title and Reference of Methodology

The emission reductions of the Project have been calculated in accordance with the approved small scale CDM-methodology AMS-I.D.: "Grid connected renewable electricity generation", version 13 and version 18.

For baseline calculations the AMS-I.D refers to the "Tool to calculate the emission factor for an electricity system" (version 01 and version 03), which offers two options of which the Combined Margin (CM) approach has been chosen. The CM consists of the combination of operating margin (OM) and build margin (BM) according to the procedures prescribed in the above- mentioned tool.

1.9 Participation under other GHG Programs

This project has not been participated or will participate in other GHG programs.

1.10 Other Forms of Credit

This project has not participated in other emissions trading programs or other binding limits. And this project has not participated in other forms of environment credit.

1.11 Sustainable Development Contributions

The project will directly contribute to sustainable development in several ways as shown below:

• Provide clean energy. The project makes use of geothermal to generate electricity. The clean electricity generation of this project is supplied to Turkey power grid to replace the same amount of electricity that would have otherwise been supplied by power grid, which is dominated by fossil fuel fired electricity. This contributes to sustainable development goals, “Ensure access to affordable, reliable, sustainable and modern energy for all”; (SDG 7). In this monitoring period, the net electricity generation is 60,846.95MWh.

• Provide decent work. The project provides 29 employment opportunities related to the operation and maintenance of the power plant, which meets one of the sustainable development goals “Promote sustained, inclusive and sustainable economic growth, full and productive employment and decent work for all” (SDG 8)

• Reduce CO_2 emissions. The project recovers geothermal to generate electricity to replace the same amount of electricity that would otherwise be generated by fossil fule power plants connected to Turkey power grid.This contributes to sustainable development goals “take urgent action to combat climate change and its impacts”; (SDG 13). The total emission reductions in this monitoring period are 35,854tCO_2.

Table 1: Sustainable Development Contributions

Row number	SDG Target	SDG Indicator	Net Impact on SDG Indicator	Current Project Contributions	Contributions Over Project Lifetime
1)	7.2	7.2.1 Renewable energy share in the total final energy consumption	Implemented activities to increase	During this monitoring period, 60846.95MWh renewable electricity is generated and exported to Turkey national power grid.	From the start date of project operation to the end date of this monitoring period, 470,166Wh [1] renewable electricity is generated.
2)	8.5	8.5.2 Unemployment rate, by sex, age and persons with disabilities	Implemented activities to increase	No further changes this monitoring period	The project provides 29 long-term job opportunities for local people.
3)	13.0	Tonnes of greenhouse gas emissions avoided or removed	Implemented activities to increase	By utilizing geothermal to generate electricity to export to national power grid, this Project has prevented the release of 35,854tCO_2 into the atmosphere during this monitoring period.	From the start date of project operation to the end date of this monitoring period, 277,758tonnes [2] of CO_2 emissions are avoided.

[1] 54566.694+49703.915+50754.148+152281.424+102014.299+60846.95=470,166MWh

[2] 32248+29375+29995+89997+60289+35854=277,758tCO_2

2 SAFEGUARDS

2.1 No Net Harm

The project utilizes Binary cycle system to generate electricity with geothermal. It is environmentally friendly and there is no harm to the environment.

Little noise may be generated by the plant. However, silencers are installed to muffler the noise. What is more, the power plant is far away from local residents.

The local regulation shows that EIA is legally not needed for the project (Exemption of EIA on 23/06/2003) because the environmental impacts of the project activity are not considered to be significant by the project participant or the host country.

Besides, this project is beneficial to the social environment. The detail can be seen in '1.11 sustainable development'.

So, no net harm generated in this project.

2.2 Local Stakeholder Consultation

The project has no negative social or environmental impacts. Furthermore, the project is located in the marginal lands of the village and inhabitants are not impacted by the project. Therefore, no public consultation has been organized.

The stakeholders are identified as mainly the working staffs. Questions were asked by DOE during remote interview with the working staffs, and no negative feedback was received. The questions are mainly about the social and economic contribution of this project.

There is a grievance book in the project manager's office. Working staff can put their comments on the book.

2.3 AFOLU-Specific Safeguards

N/A

3 IMPLEMENTATION STATUS

3.1 Implementation Status of the Project Activity

The operation of the project activity(s) during this monitoring period, including any information on events that may impact the GHG emission reductions or removals and monitoring.

The project covers an area of 25'000 square meter including two sides. One of them hosts the production wells named AS-1 and ASR-2. They are connected to the electricity generation facility

through a 900-meter-long isolated tubes in the case of well AS-1 and 100 meter for the ASR-2 well. The re-injection well, named AS-2, is located right at the generation facility.

The electricity is being fed to the national grid through a 3.5-kilometer long underground cable, which has been constructed by the Project Owner. The generation process works as follows: 3% Steam and 97% hot brine are pumped from four wells from a depth between 1300 meter (ASR-2) and 1510 (AS-1) meter. The thermal fluid is passed through a heat exchanger and the heat from the fluid is transferred to a secondary fluid, hydrocarbon. The secondary fluid is vaporized to generate electricity via the turbine and the generator. After leaving the heat exchanger water will then be re-injected back to the reservoir through the additional 962-meter deep re-injection well. Thus, a closed system is formed where any adverse effect to the environment can be avoided. Additionally, some of the waste heat -instead of reinjecting the fluid directly to the earth- is planned to be used in various greenhouses in the future.

The project is the first private investment employing the specific "Organic Rankine Cycle & Binary Technology in Turkey. The list of equipment is given in table below

Table 1. Project Equipment List

No.	Name	Quantity
1	Organic Turbine	2
2	Generator	1
3	12" control valve	3
4	Actuator	7
5	Positioner	9
6	16" control valve	4
7	6" control valve	4
8	4" control valve	2
9	8" control valve	3
10	10" control valve	1
11	Actuator	1
12	Positioner	6
13	12" control valve	4
14	Actuator	1
15	Positioner	1
16	Pentan Pump 1	1
17	Motor	1
18	Pentan Pump 2	1
19	Motor	1
20	O.E.C. Internal Use Transformator	1

In this monitoring period, the equipment runs well. There is no overhaul except the normal maintenance.

3.2 Deviations

2.1.1 Methodology Deviations

There is no methodology deviation in this monitoring period.

2.1.2 Project Description Deviations

There is no project description deviation in this monitoring period.

3.3 Grouped Projects

This is not a grouped project.

4 DATA AND PARAMETERS

4.1 Data and Parameters Available at Validation

Data / Parameter	$EF_{grid,CM,y}$
Data unit	tCO_2e/MWh
Description	Combined margin CO_2 emission factor for grid connected power generation in year y
Source of data	Calculated
Value applied	0.591 in the first crediting period 0.589 in the second crediting period
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 $EF_{grid,CM,y} = w_{OM} * EF_{grid,OM,y} + w_{BM} * EF_{grid,BM,y}$
Purpose of Data	Calculation of baseline emissions
Comments	$FC_{i,y}$,$NCV_{i,y}$,$EF_{CO2,i,y}$,$EG_{m,y}$, etc. are used to calculate $EF_{grid,CM,y}$. They are not listed here for simplification. The detail of these parameters can be shown in the renewed PDD.

Data / Parameter	$EF_{grid,OM,y}$ ($EF_{grid,OMsimple,y}$)
Data unit	tCO_2e/MWh
Description	Operation margin CO_2 emission factor for grid connected power generation in year y
Source of data	Calculated
Value applied	$EF_{grid,OMsimple,y}$=0.679 in the first crediting period

	$EF_{grid,OM,y}$ =0.638 in the second crediting period
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
Purpose of Data	Calculation of baseline scenario
Comments	/

Data / Parameter	$EF_{grid,BM,y}$
Data unit	tCO_2e/MWh
Description	Build margin CO_2 emission factor for grid connected power generation in year y
Source of data	Calculated
Value applied	0.503 in the first crediting period 0.573 in the second crediting period
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
Purpose of Data	Calculation of baseline scenario
Comments	/

Data / Parameter	w_{OM}
Data unit	/
Description	Weighting of operation margin emissions factor
Source of data	Tool to calculate the emission factor for an electricity system (version 02)
Value applied	50% in the first crediting period 25% in the second crediting period
Justification of choice of data or description of measurement methods and procedures applied	Wind and solar power generation project activities: w_{OM} = 0.75 and w_{BM} = 0.25 (owing to their intermittent and non-dispatchable nature) for the first crediting period and for subsequent crediting periods; All other projects: w_{OM} = 0.5 and w_{BM} = 0.5 for the first crediting period, and w_{OM} = 0.25 and w_{BM} = 0.75 for the second and third crediting period, unless otherwise specified in the approved methodology which refers to this tool.

Purpose of Data	Calculation of baseline scenario
Comments	/

Data / Parameter	w_{BM}
Data unit	/
Description	Weighting of building margin emissions factor
Source of data	Tool to calculate the emission factor for an electricity system (version 02)
Value applied	50% in the first crediting period 75% in the second crediting period
Justification of choice of data or description of measurement methods and procedures applied	Wind and solar power generation project activities: w_{OM} = 0.75 and w_{BM} = 0.25 (owing to their intermittent and non-dispatchable nature) for the first crediting period and for subsequent crediting periods; All other projects: w_{OM} = 0.5 and w_{BM} = 0.5 for the first crediting period, and w_{OM} = 0.25 and w_{BM} = 0.75 for the second and third crediting period, unless otherwise specified in the approved methodology which refers to this tool.
Purpose of Data	Calculation of baseline scenario
Comments	/

Data / Parameter	$NCV_{i,y}$
Data unit	GJ/t
Description	weighted average net calorific value of the fuel type i in year y. In this project, type i is diesel.
Source of data	2006 IPCC Guidelines for National Greenhouse gas inventories.
Value applied	43.3
Justification of choice of data or description of measurement methods and procedures applied	IPCC default values at the upper limit of the uncertainty at a 95% confidence interval. This data shall be fixed ex-ante for the duration of the crediting period of the project activity and shall be updated at the renewal of crediting period.
Purpose of Data	Calculation of project emissions
Comments	/

Data / Parameter	$EF_{CO2,i,y}$

Data unit	tCO_2/ GJ
Description	Weighted average CO_2 emission factor of fuel type i in year y
Source of data	2006 IPCC Guidelines for National Greenhouse gas inventories.
Value applied	0.0748 for diesel
Justification of choice of data or description of measurement methods and procedures applied	2006 IPCC default values at the upper limit of the uncertainty at a 95% confidence interval. This data shall be fixed ex-ante for the duration of the crediting period of the project activity and hall be updated at the renewal of crediting period.
Purpose of Data	Calculation of project emissions
Comments	/

4.2 Data and Parameters Monitored

Data / Parameter	**EG_y (1st CP) / $EG_{PJ,facility,y}$ (2nd CP)**
Data unit	MWh
Description	Net electricity exported to the grid in the year y / Quantity of net electricity generation supplied by the project plant/unit to the grid in year y)
Source of data	Measured by electricity meter
Description of measurement methods and procedures to be applied	Measured continuously by a power meter and recorded monthly by monitoring employees. Only the net electricity export to the grid shall be taken into account.
Frequency of monitoring/recording	Monitored continuously and recorded monthly
Value monitored	9280.56 MWh in the 1st crediting period 51566.39 MWh in the 2nd crediting period 60846.95MWh in this monitoring period
Monitoring equipment	Monitored by electricity meter. The serial number is 424848, with accuracy of 0.5S.

Monitoring equipment	Electricity meter
Brand name	ELSTER
Meter Type	A1500
Installation location	Outlet of the substation
Serial number	424848
Accuracy	0.5S

	<table><tr><td>Calibrated by</td><td>Alpha zahler</td></tr><tr><td>Calibration date</td><td>10/09/2010 02/09/2020</td></tr><tr><td>Valid till</td><td>09/09/2020 01/09/2030</td></tr></table>
QA/QC procedures to be applied	• Exported electricity to the grid is measured by an electricity meter which is controlled by both the power plant operator and by the power grid company • Trained and qualified staff is responsible for recording electricity export data from the kilowatt meter • Meters will be calibrated periodically according to national standards • Data measured by meters will be crosschecked by electricity sales receipts. In sales receipts, incomes not deriving from electricity production but declared as electricity supplied to grid because of limitations of accounting system shall be identified and subtracted. If differences still occur, the more conservative amount shall be used.
Purpose of the data	Calculation of baseline emissions
Calculation method	/
Comments	/

Data / Parameter	PE_{Dcons} (1st crediting period) / $FC_{FF,i,y}$ (2nd Crediting period)
Data unit	Tons
Description	Diesel consumed (Fuel consumed) from running the diesel generator
Source of data	Plant Records
Description of measurement methods and procedures to be applied	Diesel Consumption has been calculated on the basis of monitored operating hours on the diesel generator engine and its default consumption.
Frequency of monitoring/recording	Monthly
Value monitored	3.057
Monitoring equipment	/
QA/QC procedures to be applied	Data has been collected by qualified plant staff monthly and reported on an annual basis.

Purpose of the data	Calculation of project emissions
Calculation method	Diesel Consumption = Fuel Consumption Rate * Operating hours * Density of Diesel = 20.61 lt/hr * 178.86 hrs * 0.8292 kg/lt = 3057 kg = 3.057 tonnes
Comments	/

4.3 Monitoring Plan

The objective of the monitoring plan is to ensure the complete, consistent, clear, and accurate monitoring and calculation of the emissions reductions during the whole crediting period. The Project Owner is mainly responsible for the implementation of the monitoring plan. The electricity monitoring system is provided by Turkish Electricity Distribution Company (TEDAS)

The measurements are in accordance with the relevant Measurement Regulation of Turkey (Turkish Standards, International Electro- technical Commission Standards).

1. Monitoring Objective

The only parameter to be monitored is the amount of electricity supplied to the grid since the baseline emission factor is fixed by ex-ante calculations.

2. Monitoring Organization

The Project Owner supervises and verifies metering and recording, collects data (meter's data reading, sales/ billing receipts), calculates emission reductions and will use a monitoring report prepared by South Pole. Additionally the switchgear station, where the measurement instruments read the electricity generation and recorded in TEDAS metering system. This station is only accessible to trained power plant staff and TEDAS staff. On the last day of each month, the TEDAS staff performs the reading record.

3. Monitoring Equipment and program

The electric energy metering equipment include two electric energy meters (or kilowatt meter). The grid company (TEDAS) has installed a kilowatt meter and measures the amount of electric power supplied to the power grid.

The electricity recorded by the electric energy meter will suffice for the purpose of billing and emission reduction verification. The monitoring process is as follows:

a) The Project Owner reads and checks the electric energy meter and records the data as the first hand record of the supplied electricity to the grid;

b) The Project Owner compiles the recorded data of the supplied electricity to the grid monthly and provides the monthly balance sheet of electricity sales to TEDAS;

c) TEDAS confirms the amount of electricity exported by the Project Owner after the verification, confirmation and acceptance of the electricity data offered by the Project Owner;

d) The Project Owner provides an electricity sales invoice to TEDAS according to actual amount of electricity delivery reflected by the grid company's confirmation. A copy of the invoice is kept by the Project Owner;

e) The Project Owner properly keeps the balance sheet of electricity sales to the grid company. The periodical records of the electricity meter's data readings are archived electronically and on paper.

The meter reading will be readily accessible for the verification entity. Calibration test records will be maintained for verification.

4. Data Management

The Project Owner properly keeps the electronic spreadsheets and printout of the monthly records of the amount of supplied electricity to the grid as well as the firsthand record of the electricity supplied to the grid. Besides that, the Project Owner collects sales receipts for the power delivered to the grid as a crosscheck. At the end of each crediting year, the Project Owner compiles a monitoring report. Physical documentation of relevance for the monitoring process, such as paper-based maps and diagrams, are collected in a central place, together with the monitoring plan. The Project Owner stores all paper-based information.

All data records will be kept for a period of at least 2 years after the end of the crediting period.

5. Data quality assurance and data replacement procedures

If during a periodic meter calibration, it is found that the meter has a higher error than defined in the meter's manual, the metering data will be adjusted accordingly for the last three months or beginning at the last calibration, whichever happened later.

If the TEDAS meter fails, then data from the Dora-I meter are used. If both meters fail, conservative data substitution procedures are used from the calculation of energy production (for the purpose of VER calculation).

5 QUANTIFICATION OF GHG EMISSION REDUCTIONS AND REMOVALS

5.1 Baseline Emissions

The Project aims to generate electricity and CO_2 reduction through the substitution of grid electricity generation by fossil fuel fired power. According to the baseline methodology AMS-I.D., the emission reduction ER_y by the project activity during a given year y is defined as:

$ER_y=BE_y-PE_y-LE_y$ (1)

where BE_y is calculated as

$BE_y=EG_y*EF_{grid,CM,y}$ (2)

Where:

EG_y: Quantity of net electricity generation that is produced and fed into the grid as a result of the implementation of CDM project activity in year y (MWh/yr)

$EF_{grid,CM,y}$: Combined margin CO_2 emission factor for grid connected power generation in year y(tCO_2/MWh)

The combined emission factor $EF_{grid,CM,y}$ for the project activity is calculated as a weighted average of Operating Margin emission factor and Build Margin emission factor as described in the "Tool to calculate the emission factor for an electricity system"

$EF_{grid,CM,y}=W_{OM}*EF_{grid,OM,y}+W_{BM}*EF_{grid,BM,y}$ (3)

Table 2. Monitoring data of EG_y and calculation of BE_y

Monitoring period	Net Electricity exported to grid (EG_y, $EG_{PJ,facility,y}$) (MWh)		Data for ER calculation	$EF_{grid,CM,y}$ (tCO_2/MWh)	BE_y (tCO_2)
	sales receipt	Monitoring data			
01/11/2017-30/11/2017	728.58	764.04	728.58	0.591	431
01/12/2017-31/12/2017	642.86	646.95	642.86	0.591	380
Total in 2017	**1,403.47**	**1,410.99**	**1,371.44**	/	**810**
01/11/2018-31/01/2018	1,275.19	1,281.26	1,275.19	0.591	754
01/02/2018-28/02/2018	1,498.72	1,501.13	1,498.72	0.591	886
01/03/2018-31/03/2018	1,453.56	1460.94	1,453.56	0.591	859
01/04/2018-30/04/2018	1,167.66	1,173.67	1,167.66	0.591	690
01/05/2018-31/05/2018	1,302.45	1,308.29	1,302.45	0.591	770
01/06/2018-30/06/2018	1,211.54	1,216.33	1,211.54	0.591	716
01/07/2018-31/07/2018	1,062.02	1,070.16	1,062.02	0.589	626
01/08/2018-31/08/2018	979.88	983.08	979.88	0.589	577
01/09/2018-30/09/2018	1,215.81	1,219.14	1,215.81	0.589	716
01/10/2018-31/10/2018	1,617.65	1,623.34	1,617.65	0.589	953
01/11/2018-30/11/2018	1,425.09	1,425.25	1,425.09	0.589	839
01/12/2018-31/12/2018	1,350.86	1,352.17	1,350.86	0.589	796
Total in 2018	**15,560.43**	**15,614.76**	**15,560.43**	/	**9,180**
01/01/2019-31/01/2019	916.77	922.82	916.77	0.589	540
01/02/2019-28/02/2019	1,294.27	1,295.48	1,294.27	0.589	762
01/03/2019-31/03/2019	1,261.80	1,268.47	1,261.80	0.589	743
01/04/2019-30/04/2019	1,105.34	1,110.49	1,105.34	0.589	651
01/05/2019-31/05/2019	952.77	958.35	952.77	0.589	561
01/06/2019-30/06/2019	757.94	760.45	757.94	0.589	446
01/07/2019-31/07/2019	747.89	756.52	747.89	0.589	441
01/08/2019-31/08/2019	696.85	706.66	696.85	0.589	410
01/09/2019-30/09/2019	889.69	891.26	889.69	0.589	524
01/10/2019-31/10/2019	931.54	938.65	931.54	0.589	549
01/11/2019-30/11/2019	835.70	844.74	835.70	0.589	492
01/12/2019-31/12/2019	753.18	761.50	753.18	0.589	444

Total in 2019	**11,143.74**	**11,215.39**	**11,143.74**	/	**6,563**
01/01/2020-31/01/2020	1,991.06	1,992.39	1,991.06	0.589	1,173
01/02/2020-31/02/2020	2,259.11	2,266.09	2,259.11	0.589	1,331
01/03/2020-31/03/2020	2,170.92	2,178.46	2,170.92	0.589	1,279
01/04/2020-30/04/2020	1,956.16	1,964.73	1,956.16	0.589	1,152
01/05/2020-31/05/2020	1,631.36	1,638.98	1,631.36	0.589	961
01/06/2020-30/06/2020	1,439.41	1,443.31	1,439.41	0.589	848
01/07/2020-31/07/2020	1,156.68	1,165.25	1,156.68	0.589	681
01/08/2020-31/08/2020	547.10	553.64	547.10	0.589	322
01/09/2020-30/09/2020	830.36	835.33	830.36	0.589	489
01/10/2020-31/10/2020	602.34	609.44	602.34	0.589	355
01/11/2020-30/11/2020	1,473.42	1,474.69	1,473.42	0.589	868
01/12/2020-31/12/2020	2,094.85	2,099.48	2,094.85	0.589	1,234
Total in 2020	**18,152.77**	**18,221.79**	**18,152.77**	/	**10,691**
01/01/2021-31/01/2021	2,214.60	2,217.21	2,214.60	0.589	1,304
01/02/2021-28/02/2021	1,894.74	1,916.13	1,894.74	0.589	1,116
01/03/2021-31/03/2021	2,134.03	2,137.60	2,134.03	0.589	1,257
01/04/2021-30/04/2021	1,649.23	1,657.00	1,649.23	0.589	971
01/05/2021-31/05/2021	465.48	468.05	465.48	0.589	274
01/06/2021-30/06/2021	694.35	694.40	694.35	0.589	409
01/07/2021-31/07/2021	645.63	654.10	645.63	0.589	380
01/08/2021-31/08/2021	677.24	686.29	677.24	0.589	399
01/09/2021-30/09/2021	888.93	893.00	888.93	0.589	524
01/10/2021-31/10/2021	1,175.33	1,177.20	1,175.33	0.589	692
01/11/2021-30/11/2021	1,120.18	1,129.60	1,120.18	0.589	660
01/12/2021-31/12/2021	1,058.83	1,067.67	1,058.83	0.589	624
Total in 2021	**14,618.57**	**14,698.25**	**14,618.57**	/	**8,610**
Total in this monitoring period	**60,846.95**	**61,161.18**	**60,846.95**		**35,854**

5.2 Project Emissions

As per the renewed PDD

$PE_y = PE_{FF,y} + PE_{GP,y}$ (4)

Where,

$PE_{FF,y}$ =Project emissions from fossil fuel consumption in year y (tCO_2e/yr)

$PE_{GP,y}$ = Project emissions from the operation of dry, flash steam or binary geothermal power plants in year y (tCO_2e/yr).

Step 1. Project emissions from fossil fuel consumption ($PE_{FF,y}$)

According to the registered PDD and renewed PDD, Fugitive emissions of carbon dioxide and methane due to release of non-condensable gases from produced steam aren't accounted as Project Emissions, because the non-condensable gases resulting from the produced steam are

isolated and delivered to Linde Gaz A.S. that belongs to Linde Group being internationally recognized supplier of industrial gases.

Carbon Dioxide emissions resulting from combustion of fossil fuels are neglected, if these emissions are contributing less than 1% of baseline emissions. The project emissions due to the diesel consumption will be monitored regularly and if these emissions contribute for more than 1% of baseline emissions, then they will be deducted from the baseline emissions to calculate emission reductions of the project activity.

A summary of project emissions in the monitoring period is provided in the table below:

Table 3. Summary of parameters used to calculate for $PE_{FF,y}$

Parameter	Unit	Value	Comments
Initial Operating hours	hrs	642.22	Plant Records
Final Operating hours	hrs	821.08	Plant Records
Operating hours	hrs	178.86	Calculated
Fuel Consumption Rate	lt/hr	20.61	Generator fuel consumption specification
Fuel Consumption	lt	3686.30	Calculated
Density of Diesel	kg/lt	0.83	Supply Papers
Diesel Consumption	kg	3057	Calculated
Diesel Consumption	tonnes	3.057	Calculated
NCV of Diesel	TJ/Gg	43	2006 IPCC Guidelines for National GHG Inventories
Carbon Emission factor of Diesel	kg/TJ	74100	2006 IPCC Guidelines for National GHG Inventories
Emission Factor for Diesel	tCO_2/ ton	3.186	Calculated
$PE_{FF,y}$ (GHG Emissions from Diesel)	tCO_2	10	Calculated

The comparison between baseline emission (BEy) and project emissions from fossil fuel consumption ($PE_{FF,y}$) in this monitoring period is

Table 4. Percentage of $PE_{FF,y}/BE_y$

Monitoring period	BEy (tCO_2)	$PE_{FF,y}$ (tCO_2)	$PE_{FF,y}$ /BE_y
01/11/2017-31/12/2021	35,854	10	0.028%

As evident in the calculations presented above, the project emission of $PE_{FF,y}$ is 0.028%, which is much less than 1% of baseline emissions.

The fugitive carbon dioxide and methane emissions due to continuous well testing and well bleeding are neglected according to best practice and guidance from relevant methodologies.

Step 2. Project emissions from the operation of binary geothermal power plants (PEGP,y)

In the renewed PDD

$PE_{GP,y} = PE_{binary,y} = PE_{steam,y} + PE_{working\ fluid,y}$. (5)

Where:

$PE_{steam,y}$ = Project emissions from the operation of binary geothermal power plants due to physical leakage of non-condensable gases in year y.

In case the difference between steam inflow and outflow to the power plant is less than 1%, then the project participants are not required to account these project emissions. In this project, the non-condensable gases resulting from the produced steam are isolated and delivered to Linde Gaz A.Ş. that belongs to Linde Group being internationally recognized supplier of industrial gases. This means that, the non-condensable gas (including CH_4 and CO_2) in the steam is not flowing into heat exchanger, and it is recycled for industrial use. Thus, the physical leakage due to the flow in and out of the exchanger is not existed in this project. So, $PE_{steam,y}$ can be considered as 0.

$PE_{working\ fluid,y}$=Project emissions from the operation of binary geothermal power plants due to physical leakage of working fluid contained in heat exchangers in year y

As per VCS PD, the working fluid is pentane for this project activity and IPCC default value of $GWP_{pentane}$ is missing and thereby the project emission of working fluid ($PE_{working\ fluid,y}$) is not considered. By checking the AR5 report of IPCC, default value of $GWP_{pentane}$ is still missing and thereby $PE_{working\ fluid,y}$ was not considered for this monitoring period.

From above analysis, PEy=0

5.3 Leakage

According to AMS-I.D. Leakage Emission only have to be considered if the energy generating equipment is transferred from another activity or if the existing equipment is transferred to another activity. Since this is not the case in the underlying Project leakage can be considered as 0. Therefore, LEy=0

5.4 Net GHG Emission Reductions and Removals

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)
01/11/2017--31/12/2017	810	0	0	810

01/01/2018--31/12/2018	9,180	0	0	9,180
01/01/2019--31/12/2019	6,563	0	0	6,563
01/01/2020--31/12/2020	10,691	0	0	10,691
01/01/2021--31/12/2021	8,610	0	0	8,610
Total	35,854	0	0	35,854

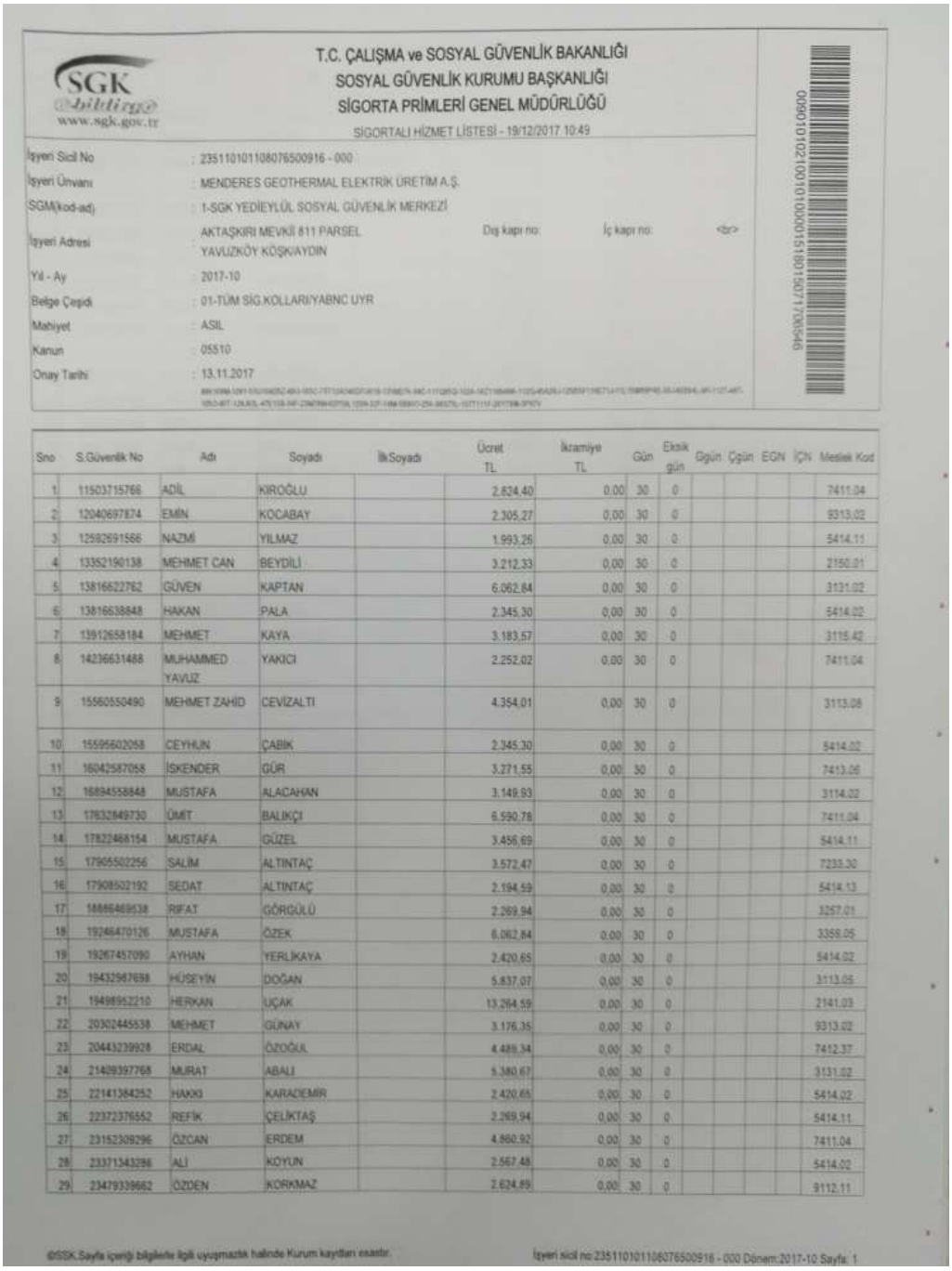
The total ER in this monitoring period is less than the ex-ante value based on PDD. This is because the exported electricity is less than the estimation. The comparison between the ex-ante and actual value is shown as follows:

Item	PDD		Ex-ante estimation	Ex-post actual Value in this monitoring period	Comparison between ex-post and ex-ante
	1st credit period	2nd credit period			
Electricity Export (MWh)	51,284	51,284	213,8473	60,847	-71%
Emission Reductions (tCO2)	30,309	30,206	126,0234	35,854	-71%

[3] 51,284/365*1522=213,847

[4] 30,309/365*242+30,206/365*1,280=126,023

APPENDIX 1: <EMPLOYEE LIST>



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T.C. ÇALIŞMA ve SOSYAL GÜVENLİK BAKANLIĞI
SOSYAL GÜVENLİK KURUMU BAŞKANLIĞI
SİGORTA PRİMLERİ GENEL MÜDÜRLÜĞÜ
SİGORTALI HİZMET LİSTESİ - 19/12/2017 10:49

İşyeri Sicil No : 23511010110807650091 6 - 000
İşyeri Ünvanı : MENDERES GEOTHERMAL ELEKTRİK ÜRETİM A.Ş.
SGM(kod-ad) : 1-SGK YEDİEYLÜL SOSYAL GÜVENLİK MERKEZİ
İşyeri Adresi : AKTAŞKIRI MEVKİİ 811 PARSEL YAVUZKÖY KÖŞK/AYDIN Dış kapı no: İç kapı no:
Yıl - Ay : 2017-10
Belge Çeşidi : 01-TÜM SİG.KOLLARI/YABNC UYR
Mahiyet : ASIL
Kanun : 05510
Onay Tarihi : 13.11.2017

Sno	S.Güvenlik No	Adı	Soyadı	İlkSoyadı	Ücret TL	İkramiye TL	Gün	Eksik gün	Ögün	Çgün	EGN	İÇN	Meslek Kod
1	11503715766	ADİL	KİROĞLU		2.624,40	0,00	30	0					7411.04
2	12040697874	EMİN	KOCABAY		2.305,27	0,00	30	0					9313.02
3	12592691566	NAZMİ	YILMAZ		1.993,26	0,00	30	0					5414.11
4	13352190138	MEHMET CAN	BEYDİLİ		3.212,33	0,00	30	0					2150.01
5	13816622762	GÜVEN	KAPTAN		6.062,84	0,00	30	0					3131.02
6	13816638848	HAKAN	PALA		2.345,30	0,00	30	0					5414.02
7	13912658184	MEHMET	KAYA		3.183,57	0,00	30	0					3115.42
8	14236631488	MUHAMMED YAVUZ	YAKICI		2.252,02	0,00	30	0					7411.04
9	15560550490	MEHMET ZAHİD	CEVİZALTI		4.354,01	0,00	30	0					3113.08
10	15595602058	CEYHUN	ÇABIK		2.345,30	0,00	30	0					5414.02
11	16042587058	İSKENDER	GÜR		3.271,55	0,00	30	0					7413.06
12	16894558848	MUSTAFA	ALACAHAN		3.149,93	0,00	30	0					3114.02
13	17632849730	ÜMİT	BALIKÇI		6.590,78	0,00	30	0					7411.04
14	17822468154	MUSTAFA	GÜZEL		3.456,69	0,00	30	0					5414.11
15	17905502256	SALİM	ALTINTAÇ		3.572,47	0,00	30	0					7233.30
16	17908502192	SEDAT	ALTINTAÇ		2.194,59	0,00	30	0					5414.13
17	18866469538	RIFAT	GÖRGÜLÜ		2.269,94	0,00	30	0					3257.01
18	19246470126	MUSTAFA	ÖZEK		6.062,84	0,00	30	0					3359.05
19	19267457090	AYHAN	YERLİKAYA		2.420,65	0,00	30	0					5414.02
20	19432987698	HÜSEYİN	DOĞAN		5.837,07	0,00	30	0					3113.05
21	19498952210	HERKAN	UÇAK		13.264,59	0,00	30	0					2141.03
22	20302445538	MEHMET	GÜNAY		3.176,35	0,00	30	0					9313.02
23	20443239928	ERDAL	ÖZOĞUL		4.489,34	0,00	30	0					7412.37
24	21409397768	MURAT	ABALI		5.380,67	0,00	30	0					3131.02
25	22141384252	HAKKI	KARADEMİR		2.420,65	0,00	30	0					5414.02
26	22372376552	REFİK	ÇELİKTAŞ		2.269,94	0,00	30	0					5414.11
27	23152309296	ÖZCAN	ERDEM		4.860,92	0,00	30	0					7411.04
28	23371343298	ALİ	KOYUN		2.567,48	0,00	30	0					5414.02
29	23479339662	ÖZDEN	KORKMAZ		2.624,89	0,00	30	0					9112.11

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