

MONITORING REPORT OF AYDIN SALAVATLI DORA-1 GEOTHERMAL POWER PLANT



Document Prepared By South Pole Carbon Asset Management Ltd.

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Table of 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	3
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	4
1.8	Title and Reference of Methodology	5
1.9	Other Programs.....	5
2	Implementation Status	6
2.1	Implementation Status of the Project Activity	6
2.2	Deviations	7
2.2.1	Methodology Deviations	7
2.2.2	Project Description Deviations.....	7
2.3	Grouped Project	7
2.4	Safeguards.....	7
2.4.1	No Net Harm	7
2.4.2	Local Stakeholder Consultation	7
3	Data and Parameters	7
3.1	Data and Parameters Available at Validation.....	7
3.2	Data and Parameters Monitored.....	10
3.3	Monitoring Plan	12
4	Quantification of GHG Emission Reductions and Removals.....	13
4.1	Baseline Emissions	13
4.2	Project Emissions	14
4.3	Leakage	14
4.4	Net GHG Emission Reductions and Removals.....	15
	APPENDIX 1: <Process flow chart>.....	16
	APPENDIX 2: <Summary of Monitoring Data and Results>	17

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 Aydın Salavatlı 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 in May 10, 2006 and the first emission reduction credit period is from July 1st, 2008 to June 30th, 2018. This is the fifth monitoring period, from 01/01/2015 to 31/10/2017. The total GHG emission reductions generated in this monitoring period is 60,289 tCO₂e

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 Tufekcioğlu
Title	Manager
Address	No:7/1, Aydın, 09100, Turkey
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Organization name	South Pole Carbon Asset Management Ltd. (SPC)
Contact person	Renat Heuberger
Title	CEO
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Email	r.heuberger@southpolecarbon.com

1.4 Other Entities Involved in the Project

N/A

1.5 Project Start Date

This project starts on April 4th, 2003.

1.6 Project Crediting Period

The first crediting period is 10 years, from July 1st, 2008 to June 30th, 2018. This monitoring report covers the period from 01/01/2015-31/10/2017 (both days included).

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.

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. For baseline calculations the AMS-I.D refers to the “Tool to calculate the emission factor for an electricity system”, 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 Other Programs

This project apply for other emission trading programs, other forms of environmental credit, or other GHG programs.

1.10 Sustainable Development

By utilizing geothermal resources for energy generation, the project activity improves the scale and security of energy supply in the country, and alleviates the fossil fuel consumption. By exporting the project's electricity to the grid system, the grid's electricity capacity is increased which enables increased access to clean energy in the region and ensures a wider scope of the national grid in providing electricity to more consumers.

2 IMPLEMENTATION STATUS

2.1 Implementation Status of the Project Activity

By means of this Monitoring Report greenhouse gas emission reductions achieved by the project activity “Aydin Salavatli Dora-I Geothermal Power Plant” are being verified and certified as per requirements of the Voluntary Carbon Standard, Version 2013. The project has been implemented and is being operated by Menderes Geothermal Elektrik Uretim A.S. (MEGE) and the carbon credits are being realized with support from South Pole Carbon Asset Management Ltd. (SPC). There is no event that may impact the GHG emission reductions and monitoring.

The project is the first private investment employing the specific “Organic Rankine Cycle & Binary Technology in Turkey. The list of equipments is given in table below and the system processing schema is given in Annex.1:

Project Technical Characteristics

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 Transformer	1

2.2 Deviations

2.2.1 Methodology Deviations

N/A

2.2.2 Project Description Deviations

N/A

2.3 Grouped Project

N/A

2.4 Safeguards

2.4.1 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.

No Environmental Impact Assessment (EIA) has been performed because the environmental impacts of the project activity are not considered to be significant by the project participant or the host country. The local regulation shows that EIA is legally not needed for the project.

Besides, this project is beneficial to the social environment. The detail can be seen in '1.10 sustainable development'.

So, no net harm generated in this project.

2.4.2 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 organised.

The stakeholders are identified as mainly the working staffs. Questions were asked by DOE during onsite 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 grievance book in the project manager's office. Working staff can put their comments on the book.

3 DATA AND PARAMETERS

3.1 Data and Parameters Available at Validation

Data / Parameter	$EF_{grid,CM,y}$
Data unit	tCO ₂ e/MWh
Description	Combined margin CO ₂ emission factor for grid connected power generation in year y
Source of data	Calculated
Value applied	0.591
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 (version 02) $EF_{grid,CM,y} = w_{OM} * EF_{grid,OM,y} + w_{BM} * EF_{grid,BM,y}$
Purpose of the data	Calculation of baseline emissions
Comments	/

Data / Parameter	$EF_{grid,BM,y}$
Data unit	tCO ₂ e/MWh
Description	Build margin CO ₂ emission factor for grid connected power generation in year y
Source of data	Calculated, further information, please see the VCS PD
Value applied	0.503
Justification of choice of data or description of measurement methods and procedures applied	$EF_{grid,BM,y} = \frac{\sum_m EG_{m,y} * EF_{EL,m,y}}{\sum_m EG_{m,y}}$ EG_{m,y} :Net quantity of electricity generated and delivered to the grid by power unit m in year y EF_{EL,m,y} :CO₂ emission factor of power unit m in year y
Purpose of the data	Calculation of baseline emissions
Comments	/

Data / Parameter	$EF_{grid,OM,y}$
Data unit	tCO ₂ e/MWh
Description	Operating margin CO ₂ emission factor for grid connected power generation in year y
Source of data	Calculated, further information, please see the VCS PD

Value applied	0.679
Justification of choice of data or description of measurement methods and procedures applied	$EF_{grid,OMsimple,y} = \frac{\sum_i FC_{i,y} * NCV_{i,y} * EF_{CO2,i,y}}{GEN_y}$ FC_{i,y} : Amount of fossil fuel type i consumed in the project electricity system in year y (ton or 1000m³) NCV_{i,y} : Net calorific value (energy content) of fossil fuel type i in year y (TJ/kt or TJ/mil m³) EF_{CO2,i,y} : CO₂ emission factor of fossil fuel type i in year y (tCO₂/TJ) GEN_y: Net electricity generated and delivered to the grid by all power sources serving the system, not including lc-mr power plants, in year y (GWh) i: All fossil fuel types combusted in power sources in the project electricity system in year y
Purpose of the data	Calculation of baseline emissions
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%
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 the data	Calculation of baseline emissions
Comments	/

Data / Parameter	W_{BM}
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%
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 the data	Calculation of baseline emissions
Comments	/

3.2 Data and Parameters Monitored

The net electricity exported to the grid and imported from the grid has been monitored by TEDAS (Turkish Electricity Distribution Company)/ AYDEM by monthly online energy meter readings and has been reflected in the PMUM records on the online portal. As the energy meters are placed in the connection point to the grid, the electricity export data shall already include the deduction of the auxiliary consumption and transmission losses from the electricity generation.

The electricity exported by the project activity as per the official PMUM records from the online portal have been taken as the basis to the emission calculations. In order to be conservative, the electricity imported is subtracted from the electricity exported before emission reduction calculations.

Data / Parameter	EG_y
Data unit	MWh
Description	Net electricity exported to the grid in the year y
Source of data	Measured and verified against electricity sale receipts. For conservative, the calculation of emission reductions in the monitoring protocols shall be the minor date of monitoring data and sales receipts.
Description of measurement methods and procedures to be applied	Measured continuously by a power meter and recorded monthly by monitoring employees of TEDAS/ AYDEM by means of online meter readings. Only the net electricity export to the grid shall be taken into account. This means that the net exported electricity is total electricity

	exported exclude electricity imported from the grid.
Frequency of monitoring/recording	Measured continuously and recorded monthly
Value monitored	102014.299
Monitoring equipment	Power meter
QA/QC procedures to be applied	- Exported electricity to the grid is measured by a kilowatt meter, which is controlled by the electricity distribution company (TEDAS/ AYDEM). - Trained and qualified staff is responsible for recording electricity export data from the kilowatt meter. - A spare meter is used for crosschecking the accuracy and both meters are calibrated if required. - Meters have been maintained/ replaced periodically according to national regulations. As mentioned earlier in section 2, TEDAS/ AYDEM officials have commenced a comparatively more reliable and accurate procedure of online electricity meter readings on a monthly basis and provide a soft copy of the break-up to the project owner and indicate the same in an online portal (PMUM records). These values are used for GHG ER calculations.
Purpose of the data	Calculation of baseline emissions
Calculation method	EGy= electricity exported- electricity imported
Comments	/

Data / Parameter	PE _{Dcons}
Data unit	tons
Description	Diesel 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	2.128
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 baseline emissions
Calculation method	Use the operation hour multiplied with fuel consumption rate and density of diesel
Comments	Consumption from the engine is expected to be

	negligible (below 1% of the total baseline reductions)
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3.3 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 firsthand 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 TEDAŞ;
- c) TEDAŞ 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 5 years following the end of the crediting period, or until 2017, whichever comes later.

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).

4 QUANTIFICATION OF GHG EMISSION REDUCTIONS AND REMOVALS

4.1 Baseline Emissions

The Project aims to generate electricity and CO₂ 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:

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

where BE_y is calculated as

$$BE_y = (EG_y - EG_{baseline}) * EF_{grid,CM,y} \quad (2)$$

Where:

The operation margin refers to a cohort of power plants that reflect the existing power plants whose electricity generation would be affected by the proposed project activity. The build margin refers to a cohort of power plants that reflect the type of power units whose construction would be affected by the proposed project activity.

All project electricity generation above baseline levels ($EG_{baseline}$) would have otherwise been generated by the operation of grid-connected power plants and by the addition of new generation sources, as reflected in the combined margin (CM) calculations described.

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" (EB35);

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

4.2 Project Emissions

According to the registered PDD, carbon Dioxide emissions resulting from combustion of fossil fuels are neglected, as 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:

Parameter	Unit	Value	Comments
Initial Operating hours	hrs	517.68	Plant Records
Final Operating hours	hrs	642.22	Plant Records
Operating hours	hrs	124.54	Calculated
Fuel Consumption Rate	lt/hr	20.61	Generator fuel consumption specification
Fuel Consumption	lt	2567	Calculated
Density of Diesel	kg/lt	0.83	Supply Papers
Diesel Consumption	kg	2128	Calculated
Diesel Consumption	tonnes	2.182	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
GHG Emissions from Diesel	tCO ₂	7	Calculated

As evident in the calculations presented above, the project emission is 7 tCO₂ for the fifth monitoring period, which is much less than 1% of base line 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.

The Project Emissions have to be considered in the case of the addition of renewable energy generation units at an existing renewable power generation facility, where the existing and new units share the use of common and limited renewable resources. Provided that the Project has been a Greenfield investment it is a standalone project and Project Emissions are:

$$PE_y = 0$$

4.3 Leakage

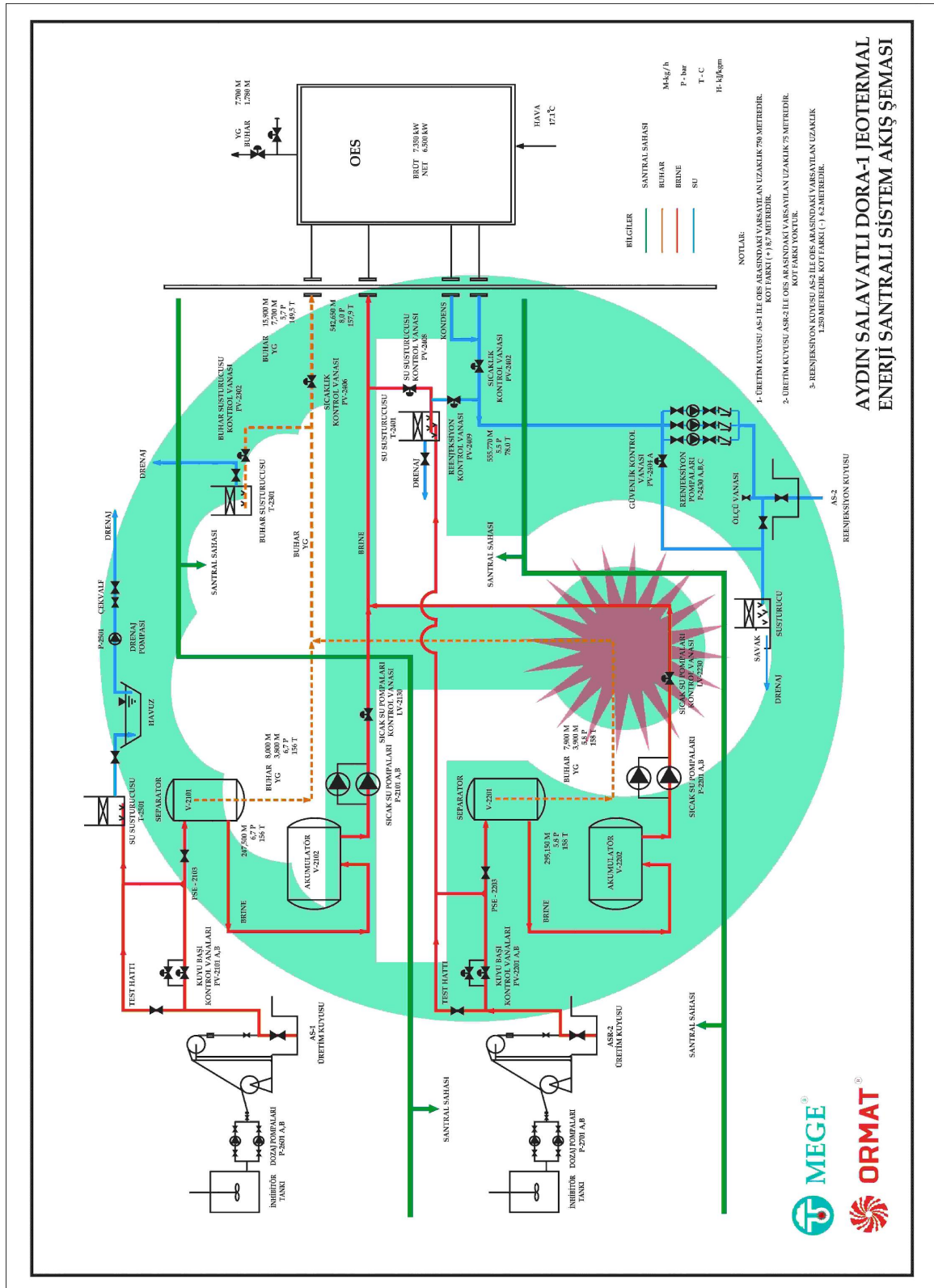
According to AMS-I.D. Leakage Emission only have to be considered if the energy generating equipment is transferred from another activity or if the existing equipment is transferred to another activity. Since this is not the case in the underlying Project leakage can be considered as:

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.

4.4 Net GHG Emission Reductions and Removals

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)
01/01/2015 - 31/12/2015	26,881	0	0	26,881
01/01/2016 - 31/12/2016	24,579	0	0	24,579
01/01/2017 - 31/10/2017	8,829	0	0	8,829
Total	60,289	0	0	60,289

APPENDIX 1: <PROCESS FLOW CHART>



APPENDIX 2: <Summary of Monitoring Data and Results>

A summary of monitoring data and emission reductions based on aggregated data on a monthly basis are provided in the table below:

N o.	Ye ar	Month	Da ys	Export electri city of Sales receipt	Export electrici ty of monitor ing data (official records)	Official Records (PMUM)		Calculations		
			10 35			Electricit y exported (kWh)	Electri city import ed (kWh)	Balance of Net electricity Exported to the Grid (kWh)	GHG Emissio n Factor (tCO2/M Wh)	Emission Reductio ns (tCO2e)
1	20 15	Januar y	31	4,673,769	4,673,768.40	4,673,768.40	0.00	4,673,768	0.591	2,762
2		Februa ry	28	4,096,600	4,096,612.80	4,096,600.00	1,864.80	4,094,735	0.591	2,420
3		March	31	4,416,098	4,414,599.00	4,414,599.00	264.60	4,414,334	0.591	2,609
4		April	30	4,001,433	4,001,445.00	4,001,433.00	1,071.00	4,000,362	0.591	2,364
5		May	31	3,592,563	3,592,562.40	3,592,562.40	0.00	3,592,562	0.591	2,123
6		June	30	3,384,826	3,383,805.60	3,383,805.60	529.20	3,383,276	0.591	2,000
7		July	31	3,202,189	3,202,201.80	3,202,189.00	718.20	3,201,471	0.591	1,892
8		August	31	3,142,956	3,142,956.60	3,142,956.00	1,675.80	3,141,280	0.591	1,856
9		Septe mber	30	3,339,013	3,320,062.20	3,320,062.20	793.80	3,319,268	0.591	1,962
10		Octobe r	31	3,702,183	3,617,787.60	3,617,787.60	844.20	3,616,943	0.591	2,138
11		Novem ber	30	3,796,266	3,733,770.60	3,733,770.60	3,641.40	3,730,129	0.591	2,205
12		Decem ber	31	4,317,263	4,317,251.40	4,317,251.40	0.00	4,317,251	0.591	2,551
Sub-Total-2015						45,496,785.20	11,403.00	45,485,382		26,881
13	20 16	Januar y	31	4,323,500	4,323,501.00	4,323,500.00	957.60	4,322,542	0.591	2,555
14		Februa ry	29	4,069,246	4,069,258.20	4,069,246.00	0.00	4,069,246	0.591	2,405
15		March	31	4,233,688	4,233,688.20	4,233,688.00	189.00	4,233,499	0.591	2,502
16		April	30	3,624,907	3,624,894.00	3,624,894.00	0.00	3,624,894	0.591	2,142
17		May	31	3,494,938	3,494,950.20	3,494,938.00	592.20	3,494,346	0.591	2,065
18		June	30	2,636,185	2,636,172.00	2,636,172.00	1,209.60	2,634,962	0.591	1,557
19		July	31	2,653,775	2,653,774.20	2,653,774.20	1,360.80	2,652,413	0.591	1,568
20		August	31	2,804,357	2,804,356.80	2,804,356.80	2,759.40	2,801,597	0.591	1,656
21		Septe mber	30	3,033,425	3,033,424.80	3,033,424.80	1,335.60	3,032,089	0.591	1,792
22	Octobe r	31	3,335,	3,436,13	3,335,938.	315.00	3,335,623	0.591	1,971	

2		r		938	3.40	00				
2		Novem	30	3,440,644	3,440,656.80	3,440,644.00	1,297.80	3,439,346	0.591	2,033
3		ber								
2		Decem	31	3,948,752	3,948,751.80	3,948,751.80	189.00	3,948,563	0.591	2,334
4		ber								
Sub-Total-2016						41,599,327.60	10,206.00	41,589,122		24,579
2		Januar	31	3,718,424	3,723,526.80	3,718,424.00	2,343.60	3,716,080	0.591	2,196
5		y								
2		Februa	28	2,963,470	2,962,398.60	2,962,398.60	819.00	2,961,580	0.591	1,750
6		ry								
2		March	31	2,616,592	2,612,547.00	2,612,547.00	8,038.80	2,604,508	0.591	1,539
7										
2		April	30	1,958,027	1,955,280.60	1,955,280.60	0.00	1,955,281	0.591	1,156
8										
2		May	31	1,295,759	1,295,746.20	1,295,746.20	4,183.20	1,291,563	0.591	763
9										
2		June	30	678,195	678,195.00	678,195.00	2,797.20	675,398	0.591	399
3										
3		July	31	418,181	418,168.80	418,168.80	1,297.80	416,871	0.591	246
1										
3		August	31	379,865	379,877.40	379,865.00	516.60	379,348	0.591	224
2										
3		Septe	30	447,489	447,501.60	447,489.00	1,134.00	446,355	0.591	264
3		mber								
3		Octobe	31	494,941	495,709.20	494,941.00	2,129.40	492,812	0.591	291
4		r								
Sub-Total-2017						14,963,055.20	23,259.60	14,939,796		8,829
Total						102,059,168.00	44,868.60	102,014,299		60,289
Total Baseline Emisssons (tCO₂e)										60,289
GHG Emissions from DG Set (tCO₂e)										-
Total GHG ERs (tCO₂e)										60,289

Parameter	Unit	Value	Comments
Initial Operating hours	hrs	517.68	Plant Records
Final Operating hours	hrs	642.22	Plant Records
Operating hours	hrs	124.54	Calculated
Fuel Consumption Rate	lt/hr	20.61	Technical Data
Fuel Consumption	lt	2567	Calculated
Density of Diesel	kg/lt	0.83	Supply Papers
Diesel Consumption	kg	2128	Calculated
Diesel Consumption	tonnes	2.128	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

GHG Emissions from Diesel	tCO ₂	7	Calculated
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