Gold Standard
for the Global Goals

TEMPLATE

MONITORING REPORT

PUBLICATION DATE **14.10.2020**

VERSION **v. 1.1**

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

This document contains the following Sections

KEY PROJECT INFORMATION

Key Project Information

GS ID (s) of Project (s)	GS1061
Title of the project (s) covered by monitoring report	Kayseri Molu Landfill Gas to Energy Project, Turkey
Version number of the PDD/VPA-DD (s) applicable to this monitoring report	Version 08
Version number of the monitoring report	06
Completion date of the monitoring report	10/08/2022
Date of project design certification	08/10/2013
Date of Last Annual Report	N/A
Monitoring period number	3rd
Duration of this monitoring period	11/04/2019 - 30/11/2021 (both days are included)
Project Representative	Her Enerji ve Çevre Teknolojileri Sanayi Ticaret A.Ş.
Host Country	Turkey
Activity Requirements applied	☐ Community Services Activities ☒ Renewable Energy Activities ☐ Land Use and Forestry Activities/Risks & Capacities ☐ N/A
Methodology (ies) applied and version number	ACM0001: Flaring or use of landfill gas --- Version 13.0
Product Requirements applied	☒ GHG Emissions Reduction & Sequestration ☐ Renewable Energy Label ☐ N/A

Table 1 - Sustainable Development Contributions Achieved

Sustainable Development Goals Targeted	SDG Impact	Amount Achieved	Units/ Products
SDG 13 Climate Action	Emissions Reductions	Emission Reduction:429,098 tCO2/MP CO: 9.24 NMVOC: 0.89	VERs tons/MP
SDG 7 Affordable and clean energy	MWh of renewable energy generated.	94,596.069 renewable energy	MWh/MP
SDG 8 Decent work and economic growth	The project provides employment. Trainings are provided.	13 employees work at the plant. HSE trainings are given to all employees at the plant.	number

Table 2 – Product Vintages

		Amount Achieved		
Start Dates	**End Dates**	**VERs**	**…**	**…**
11/04/2019	31/12/2019	126,242		
01/01/2020	31/12/2020	142,428		
01/01/2021	30/11/2021	160,428		

SECTION A. DESCRIPTION OF PROJECT

A.1. General description of project

Her Enerji ve Çevre Teknolojileri Sanayi Ticaret A.Ş. (Her Enerji) invested into a biogas power plant to generate electricity and feed it into the Turkish grid. The biogas power project was built close to Molu village of Koca Sinan district in the province of Kayseri in Turkey. The project aims at avoiding greenhouse gas (GHG) emissions from existing landfill area by collecting biogas to generate electricity. Thus, in addition to the direct avoidance of GHG emissions, further indirect emission reductions are achieved through the CO2-neutral replacement of fossil fuels used for power generation.

The Gold Standard organization sets a framework – following the schemes defined by the Kyoto-Protocol for the international trading of emission reductions – for the generation and trading of certificates attesting emission reductions achieved by a project. The Gold Standard VER approach is applicable in countries that are not subject to a GHG emission target defined in the Kyoto-Protocol.

Construction work for project started at the end of June 2011. The activity includes installation of landfill gas extraction system, an enclosed flare as well as three biogas driven gensets for electricity production with capacity of 1,560 kWe, 1,305 kWe and 1,357 kWe each. The total licensed installed capacity of the project is 4.222 MWe. The entire net electricity production during this Monitoring Period is 94,596.069 MWh. The electricity produced by project activity results in a total emission reduction of 429,098 tonnes of CO2e during this Monitoring Period. The extraction system includes a network of vertical gas extraction wells, de-watering units and gas transport pipelines connected to a main collector system. The gas is driven to gas engine and the flare via a booster system.

The landfill gas to electricity project consists of:
1- Pipelines that collect landfill gas from landfill with help of Booster.
2- Booster system that pull LFG
3- Blower that blow the LFG to the gas Engines
4- Gas engines that burn the LFG to produce electricity
5- Enclosed flare system that burns the extra gas that is not burnt in the Engines.

The working principles of the landfill gas are as follow. The LFG which is caused by organic content of the landfill collected by pipelines connected to the booster system. The gas which is collected by booster also blew to the engine to be burnt down. If there is failure of the engines the collected gas directed to the flare system. In the system there is no need for auxiliary fuels for the start-up of the engines, because there is no need. The LFG can be burnt directly.

A.2. Location of project

The project is situated within the borders of Kayseri city, Koca Sinan district in Turkey. Kayseri landfill area is located 4 km from the nearest residential area, Molu Village. The landfill area serves approximately 912,000 people. Project coordinates are given below;

	Coordinates
Latitude	38° 47' 40.2" N
Longitude	35° 18' 18.6'' E

A.3. Reference of applied methodology

ACM0001 Version 13.0: 'Flaring or use of landfill gas[1]

Used tools:

Methodological tool: "Combined tool to identify the baseline scenario and demonstrate additionality" (Version 05.0.0)

Methodological tool: "Emissions from solid waste disposal sites" (version 06.0.0)

Methodological tool: "Baseline, project and/or leakage emissions from electricity consumption and monitoring of electricity generation" (Version 01.0.0)

Methodological tool "Project emission from flaring" (Version 02.0.0);

Methodological tool: "Tool to determine the mass flow of a greenhouse gas in a gaseous stream" (Version 02.0.0)

A.4. Crediting period of project

The project activity adopted a fixed crediting period, i.e. 10 years (01/12/2011-30/11/2021).

[1] See, http://cdm.unfccc.int/methodologies/SSCmethodologies/approved.html

SECTION B. IMPLEMENTATION OF PROJECT

B.1. Description of implemented project

The project installation is completed according to the description in the PDD and is completely operational. The project consists of only one site. The activity includes installing a landfill gas extraction system, an enclosed flare, and three biogas driven gensets for electricity production with a capacity of 1,560 kW, 1,305 kW, and 1,357 kW each. The total licensed, installed capacity of the project is 4.222 MWe. The extraction system includes a network of vertical gas extraction wells, de-watering units and gas transport pipelines connected to the main collector system. The gas is driven to the gas engine and the flare via a booster system. The Molu Landfill Project reduces methane gas generated at the Molu landfill by combusting the collected gas in an engine to generate electricity.

By implementing the project, gas extraction and control system was implemented. The control activities include periodic adjustment of the gas wells by means of measuring equipment - gas flow, methane content, and oxygen content are very important parameters (landfill gas may form an explosive mixture when it combines with air in certain proportions; methane is explosive between its LEL of 5% by volume and its UEL4 of 15% by volume).

The gas extraction plant is equipped with aspirators that create a suction vacuum in the system necessary for LFG extraction (booster system). Landfill gas is used for electricity generation, and excess gas is flared in a high-temperature flare (800-1200°C, retention time 0.3 s). An emergency genset is available for the start-up of the biogas engine. The produced energy is fed into the national grid. There is also an emergency diesel genset in the plant, which was only used during construction. The Standby power of the diesel generator is 101 kVA, / Continuous power 82 kVA.
During Second Monitoring Period, two boosters were employed. In the first 10 months of 2014, only Booster-1 was in operation. Since the 10th month of 2014, Booster-2 has also been activated, and both boosters have worked together since then. Booster 1 has been deactivated from time to time, depending on the gas potential in the field. However, Booster -2 worked continuously during the second and third monitoring periods. During third Monitoring Period, there have been no failures in the engines or flare.

The most important milestones are included in the following table:

Table 2: Milestones

Date (DD/MM/YYYY)	Activity
27/09/2010	Contract with the Municipality
04/03/2011	Date of Board Decision on Carbon income
08/02/2011	First Proposal Request from VER Consultants
29/04/2011	Turnkey agreement with İltekno, which is the date of decision making
05/05/2011	Signature with FutureCamp Turkey for VER Development
01/07/2011	Starting Construction Activities with Roads and Site Preparation
01/08/2011	Issuance of the License
14/10/2011	The date of the contract with the DOE
31/10/2011	Operation date for first gas engine
21/11/2011	Date of Submission of Initial PDD to DOE
01/12/2011	Start Date of the Crediting Period
27/07/2012	Operation date for second gas engine
05/07/2013	Operation date for third gas engine
08/10/2013	Registration Date of the Project Activity to the GS
31/03/2014	End date of the First Monitoring Period
31/12/2016	End date of the Second Monitoring Period
11/04/2019	Start Date of the Third Monitoring Period
30/11/2021	End Date of the Third Monitoring Period (End date of the Crediting Period)
11/04/2022	Site Visit Conducted with the VVB

Moreover, the Project is in commercial operation in line with the description in the registered PDD.

There are no significant overhaul times, downtimes of equipment, or equipment exchange that could impact the applicability of the UNFCCC tools and methodologies that have been used.

B.1.1 Forward Action Requests

Forward Action Request #1: All Gold Standard Registered or Issued projects, irrespective of the Standard version with which they were registered, shall transition to GS4GG. This shall occur from the 01st March 2018, with the next verification/Performance Certification or the next renewal of crediting period (whichever is earlier) that will start after this date. The next MP shall be monitored and verified under GS4GG.
Answer to FAR#1: The transition of the Project to GS4GG has now been completed, and this Monitoring Period is now being conducted under GS4GG.

Forward Action Request #2: During 1st MP, the reported ER amount was 92% higher than estimated in PDD and was justified via default factors and IPCC values, those were applied in PDD which were deemed more conservative than realized ones. Under E.6 of MR of 2nd MP, it is discussed further and estimated values with real monitored values compared to substantiate the 186% increase from estimated ER amount. For next MP, same shall be considered and VVB shall provide opinion on difference – if any monitored at a similar pattern.
Answer to FAR#2: There is a significant increase from the estimated values for this monitoring period as well. The exact reasons are still valid as during the registration, very conservative and default values were applied to estimate the emissions reductions. For instance, landfill gas collection efficiency was taken as 50% during registration, while the actual collection efficiency was raised almost to 85% during the second and third monitoring periods. And the GWP of methane was taken as 21 in the registration, while during this monitoring period, for the years 2019 and 2020, it was taken as 25, and for the 2021 as 28, which also results in higher amounts. Furthermore, the feasibility study conducted was taken as a reference to evaluate the methane generation potential during registration, and this study shows that the most increased generation will be during 2015 and 2016 years considering the landfill would accept wastes till 2015, and after 2015, and the waste acceptance would stop. However, the landfill site continued to receive wastes till the end of 2018. For this reason, even though the methane generation amount was not as high as in the second monitoring period, methane continued to be built up in the landfill site with the incoming waste during the third monitoring period.

Furthermore, as per paragraph 2.1.3 of the GS Rule Clarification "Assessment Approach For Reporting Higher Ex-Post Emission Reductions" published on 04/07/2022, "*the emission reductions will be capped to the upper bound of the sensitivity analysis range for the monitoring period (annual emission reductions values) in which the higher ex-post emission reduction was reported.*"

In the previous monitoring period, the highest registered emissions reductions amounted to 190,102 tCO_2e for 2015. For this monitoring period, the highest emission reductions amounted to 160,428 tCO_2e for 2021, 18.5% less than the higher reported ex-post emission reduction.

Moreover, as per paragraph 2.1.6 of the GS Rule Clarification "Assessment Approach For Reporting Higher Ex-Post Emission Reductions", IRR calculations are reperformed again with the highest net electricity generated in this monitoring period. Because the only relevant parameter that affects the emission reductions and that is also relevant for the conducted IRR analysis was the net electricity generation, for that reason, IRR analysis was reperformed with 35,645.355 MWh/yr, the highest net electricity generation amount in 2021. However, the booster expenses were an important item for the conducted IRR analysis during registration. Considering that there was only one booster during registration and two boosters after the first monitoring period, the booster-related expenses were also multiplied by two for the reperformed IRR. The resulting IRR was found to be 14.66%, which is still lower than the benchmark value of 20%.

B.2. Post-Design Certification changes

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

There is no revision in the monitoring plan of the project

B.2.2. Corrections

The registered PDD explains that "the extraction system shall include a network of vertical gas extraction wells, de-watering units and gas transport pipelines connected to the main collector system. The gas will be driven to the gas engine and the flare via an aspiration system". The term aspiration system is used instead of booster system mistakenly. This is corrected in section A.1 of MR

B.2.3. Changes to start date of crediting period

The proposed Kayseri Molu Landfill gas to electricity project started to operate one month before its planned date. That is why the start date of crediting period has been changed from 01/01/2012 to 01/12/2011 mentioned in the PDD.

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

None

B.2.5. Changes to project design of approved project

The invoices for the purchase of diesel cannot be reached; that is why the consumption amount of diesel is used for calculating emissions from diesel consumption. Also, as per the VVB opinion obtained during the first monitoring period: *"There is no information about the calibration requirement about the diesel generator as confirmed through the generator datasheet. Anyhow, there is no need to calibrate for such devices. In addition, a lot of similar projects are in the same situation. Their diesel generators could not be crosschecked and confirmed with the invoices since, in Turkey, all the project participants purchased the fuel jointly with their vehicles. Therefore, calculating operating hours and per hour consumption is the best approach for estimating spent fuel"*. The Standard approved the change during the first Monitoring Period.

SECTION C. DESCRIPTION OF MONITORING SYSTEM APPLIED BY THE PROJECT

The monitoring methodology is based on directly measuring the amount of landfill gas captured and destroyed at the flare platform(s) and the electricity generating unit(s) to determine the quantities, as shown in Figure 1. The monitoring plan provides for continuous measurement of the quantity and quality of LFG flared. The main variables that need to be determined are the quantity of Volumetric flow of the gaseous stream in the hour h on a dry basis ($V_{t,db}$) and the quantity of methane used to generate electricity ($LFG_{electricity,y}$). The methodology also measures the energy generated by the use of LFG ($EC_{BL,y,}$).

From the monitoring methodology, it could be seen that there are the following main variables to be measured:

Table 3: Summary of Monitoring Plan

#	Parameter	Description
1	$V_{t,db}$	The volumetric flow of the gaseous stream in the hour *h* on a dry basis (Nm^3)
2	$F_{CH4,sentflare,y}$	Amount of methane in LFG which is sent to the flare in year y
3	$F_{CH4,EL,y}$	Amount of methane in LFG which is sent to the genset for electricity generation in year y
4	$V_{CH4,t,db}$	The volumetric flow of CH4 in time interval on a dry basis (Nm^3)
5	T	The temperature of the landfill gas
6	P	The pressure of the gaseous stream in the hour *h*
7	w_{CH4}	Methane fraction in the landfill gas
8	$EC_{BL,y}$	Net electricity delivered to the grid

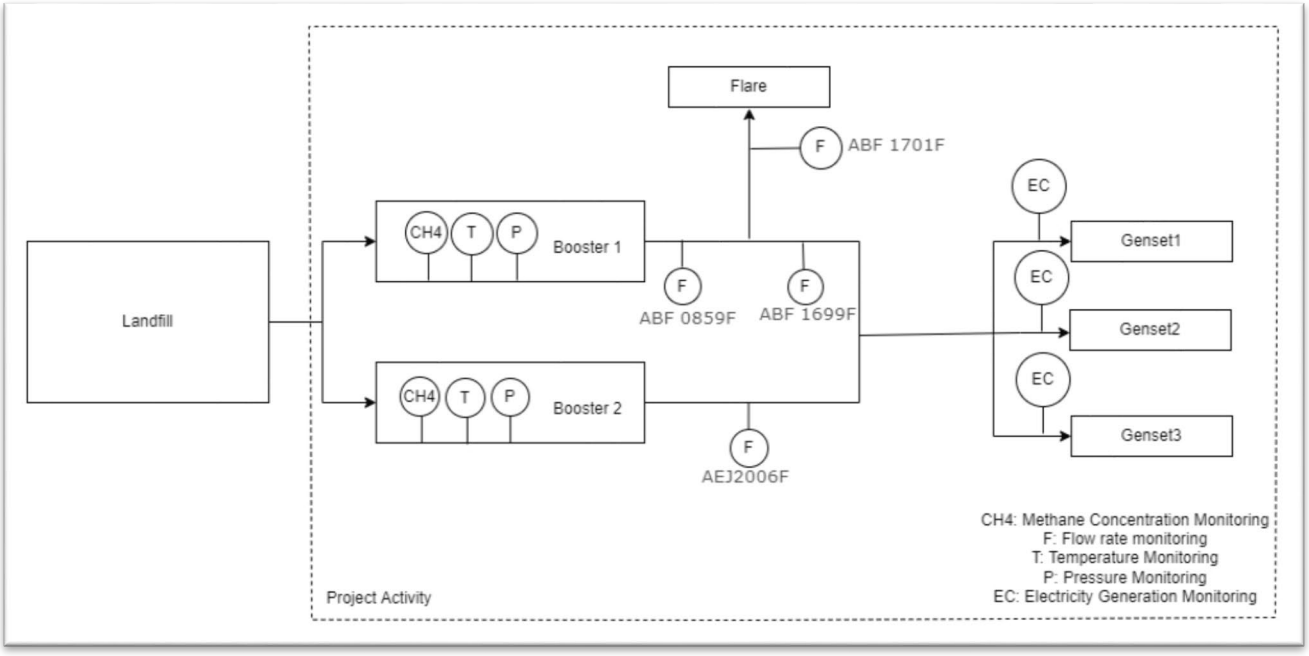

Figure 1: Monitoring Schema

Till October 2014, only Booster 1 was in operation. Booster 1 has three flow meters that measure the LFG that goes to flare (with the serial number ABF1701F), to engines (with the serial number ABF1699F), and also the total flow (with the serial number ABF0859F). After October 2014, Booster 2 was added to the system with one flow meter to measure the total LFG flow that goes to the engines (with the serial number AEJ2006F).

Other than the fixed gas flow and pressure measurement equipment present in boosters, portable flow meters, pressure meters, and gas analysers were employed to ensure more reliable monitoring of the process. Whenever there seems to be a problem in one of the fixed measurement equipment, portable devices are employed to measure the relevant parameter.

Mass flow of methane in the residual gaseous is determined by calculation. The amount of landfill gas combusted in generators is determined by calculations. Methane fraction in the total gas is depicted by Gas Analyser (with serial number 80024000-2428). Project Emissions from flaring are calculated. The thermocouple depicts the temperature in the exhaust gas of the enclosed flare.

Table 4: The Table of measurement devices is provided below:

FIXED GAS FLOW AND PRESSURE MEASUREMENT EQUIPMENT IN BOOSTER						
	MODEL	**MANUFACTURER**	**SERIAL NO.**	**ACCURACY**	**CALIBRATION FREQUENCY**	**DATE of CALIBRATION**
Thermocouple	K TYPE	Isocontrolli	2012OF000652	Not Declared	1-2 years	01/08/2011 10/05/2014
Gas Analyser 1	SSM-6000-LT (2011)	PRONOVA	80024000-1598	2%-3% OF FULL SCALE (DEPENDING OF GAS CALIBRATION QUALITY)	10 years	01/08/2011 10/07/2020
Gas Analyser 2	SSM-6000-LT (2014)	PRONOVA	80024000-2428	2%-3% OF FULL SCALE (DEPENDING OF GAS CALIBRATION QUALITY)	10 years	22/07/2014
Flow meters Booster 1	ORIFICE PLATE - DCMD200016CS 2011	TECNOVA HT	ABF1699F; ABF0859F;	2%-3% OF FULL SCALE	10 years	21/12/2012 09/10/2020
Flow meter Flare	ORIFICE PLATE - DCMD200016CS 2011	TECNOVA HT	ABF 1701F	2%-3% OF FULL SCALE	10 years	21/12/2012 09/10/2020
Flow meter Booster 2	2014	TECNOVA HT	AEJ2006F	2%-3% OF FULL SCALE	10 years	26/09/2014
Pressure meter 1	FCX-FKP – FKGT01V5AMCYYAA1 YY 2011	FUJI ELECTRIC	D6500B-3/84447450	0.065% OF FULL SCALE	10 years	01/08/2011 09/10/2020
Pressure meter 2	FKCT22V5AKCYY AA2YY 2014	FUJI ELECTRIC	KEMA 08ATEX0120 X	0.065% OF FULL SCALE	10 years	04/09/2014
Diesel Generator	1006TG1A	TEKSAN	TJ101PR5A	50Hz	10 years	24/01/2011 27/04/2022

The Project's net amount of electricity supplied to the grid is determined by the primary and secondary electricity measurement devices by EPİAŞ. There are two electricity meters as main and backup. The Project Activity started producing energy with Elster brand electricity meters. The details of the meters are shown in the following table. On 12/07/2019, the main and backup meters were changed with the Landisgyr brand meters. The meter tests were conducted on 31/03/2020 for the new main and backup electricity meters. Since the calibration of the meters is valid for ten years, there was no calibration conducted during this Monitoring Period. Moreover, the project owner has no control over the electricity meters, which means they can't perform any change on the electricity meters. Sole control over the electricity meters is on KCETAS Electricity Distribution Company. The meters are annually controlled for accuracy and sealed by the KCETAS Electricity Distribution Company. KCETAS is responsible for monitoring and ensuring that the measurement devices satisfy the requirements. KCETAS is also responsible for the calibration of the measurement devices. In case of any detected problem (e.g. failure of one of the measurement devices, inconsistency between the readings of the primary and the backup meter etc.), the plant manager in the name of the Project owner is responsible for coordinating the necessary maintenance and calibration procedure with the KCETAS.

	Model	Serial Nr	Accuracy class	Calibration Frequency	Calibration date
Main Electricity Meter	Elster 1500	447413	IEC-EN 60687 0.5 class	10 years	06/12/2011
Back Up Electricity Meter	Elster 1500	447412	IEC-EN 60687 0.5 class	10 years	06/12/2011
Main Electricity Meter after 12/07/2019	LANDISGYR ZG405CR-0601f	42595977	IEC-EN 60687 0.5 class	10 years	09/03/2018
Back Up Electricity Meter 12/07/2019	LANDISGY ZG405CR-0601f	42595976	IEC-EN 60687 0.5 class	10 years	09/03/2018

Responsibilities for the data processing and management lie with Her Enerji. Therefore, they established a VER team. This team is responsible for monitoring all data required to estimate emission reductions. Life Enerji also assists VER Team with regard to the monitoring aspects of the project. The plant manager has the main responsibility for

collecting and archiving the data. According to the monitoring plan, the data is monitored and recorded by qualified technicians. All the technicians receive proper training to ensure that they understand their specific tasks and equipment handling. The records are double-checked by the General Manager of the Proposed Project, who is responsible for the accuracy and frequency of the measurements. In the below Figure management structure can be seen.

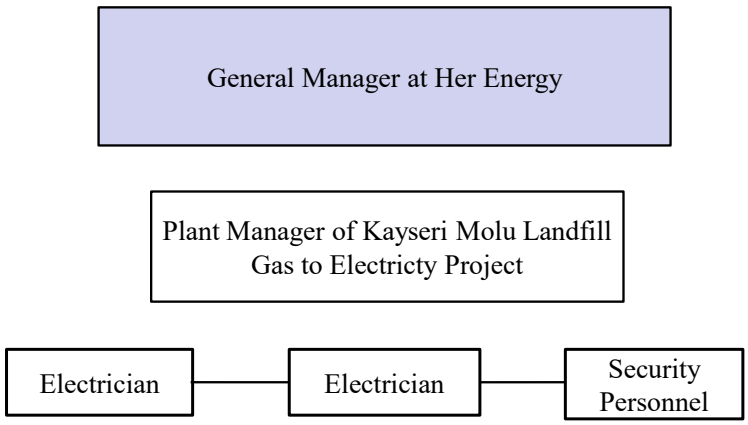

Figure 2: Organizational chart

EPIAS stores the power generation data. The website of EPIAS (https://www.epias.com.tr/uzlastirma/aylik-uzlastirma-bildirimsureci/) is accessible by the Project owner with their unique user ID and password. Once accessed, the Project owners can retrieve electricity generation and consumption data. The Project owner uses the same data for invoicing purposes. The electricity generation data are reported on a monthly basis.

Data Processing and collection

The monitoring equipment and other plant equipment are connected to a Programmable Logic Controller (PLC), which collects all the monitoring data and sends them to the SCADA system so that the operator can read the main parameters in real-time. The PLC

archives reading values in a database which is accessible through the SCADA interface. Monitored data can be read and downloaded with the SCADA system for reporting purposes. Moreover, these electronic records are backed-up in a separate computer. The main source for landfill gas data is the Project activity's PLC-SCADA system. The system automatically reads measurement devices and records data on hard drives. The PLC system records meter readings at pre-determined intervals, as specified in the CDM monitoring manual. This data is used to calculate the total emission reductions.

1) Flow measurements

Gas flow is measured by flow meters, including the flow into the flare, generators and the total flow. These parameters are required to be normalized at 0°C and 1 atm, using actual gas temperature and pressure data to be measured with temperature and pressure transmitters. These in-built transmitters are integrated into each flow meter and equipped with a flow computer so that the values sent to the SCADA system have already been normalized (converted to normal cubic meters). Therefore, temperature and pressure data at each flowmeter do not need to be separately monitored. Methane content in the gas is measured by a gas analyser that is connected to the PLC-SCADA system.

Calibration: The flow sensors are calibrated according to the gas's specified temperature, pressure, and composition as per the manufacturer's recommendation. The equipment selected will allow dynamic compensation for these parameters, normalized to standard temperature, pressure, and gas composition. There will be a periodic verification according to the requirement of equipment specifications.

2) Gas Quality and efficiency of the flare

An enclosed flare unit determines methane destruction with an inbuilt flame detection unit. The project emissions from flaring and emission reductions from the destruction of LFG have been monitored at this point. The readings have been taken and recorded internally by compatible and proper measurement devices automatically with high data quality. The measured parameters are automatically converted to dry- basis and normal

conditions by the PLC system. The instruments monitor parameters continuously. The emissions are calculated using the methodological tool "Project emissions from flaring" (v. 02.0.0), which is the newest version of the tool at the time of the preparation date of this monitoring report.

The concentration of methane and oxygen in the landfill gas stream and the exhaust gas of the flare are the parameters that are essential for the calculation of emission reductions and the safe and efficient operation of the system.

The concentration of methane and oxygen in the landfill gas stream is controlled by a common sample line installed in the main collection system piping and measured continuously by two separate analysers to measure methane, oxygen and carbon dioxide each. Although compensation for temperature and pressure is not required for the methane and oxygen sensors, the sensors are designed to operate within specified temperature and pressure conditions.

The concentration of methane and oxygen in the exhaust gas stream is monitored by a common sample line installed in the upper section of the flare.

Calibration: Analysers are periodically calibrated according to the manufacturers and regulations on "Metering and Testing of Metering Systems'2 of the Ministry of Science, Industry and Technology recommendation. Calibration equipment will provide +/- 1% accuracy by volume.

3) Electricity Generation:

The electricity generation data is stored by EPIAS, the financial settlement centre of TEIAS (the national grid operator). The website of EPIAS (https://www.epias.com.tr/uzlastirma/) is accessible by the Project owner with their ID used for control and checks and for invoicing purposes. The electricity generation data is reported on a monthly basis. The procedure involves the following tasks:

- Accessing the website of EPIAS (https://www.epias.com.tr/uzlastirma/),
- Obtaining the electricity generation and consumption reports

[2] See, http://www.sanayi.gov.tr/download/osgm/olcu_aletleri_muayene_yonetmelik.zip (page 2)

- Store the data in electronic version on the computer of Her Enerji on the site
- Issue invoices to TEİAŞ based on the data published in EPIAS.

A Backup Unit for Systematic Storage

i. Electricity Generation:
There are two measurement devices; a primary measurement device and a secondary (i.e. back-up or check-meter) measurement device for quality assurance, to be used if the primary meter fails. Both the main and backup measurement devices measure and store the aggregate total electricity import and export for the whole Project in real-time. The electricity meters are under the responsibility of TEIAS, and they are located in the sub-station, which also belongs to TEIAS.

The invoices are kept by the Project owner as hard copies. Furthermore, the EPIAS system stores the reports electronically, which is accessible to the Project owner whenever necessary. After the monthly reports are obtained from EPIAS, data are aggregated using a separate spreadsheet. The monthly generation and consumption data are entered into the spreadsheet, which calculates the emission reductions during the monitoring period.

ii. Methane Destruction:
Data Storage: The electronic monitoring system (PLC) will periodically archive the reading data. Written documents (e.g. equipment replacement protocols, accident logs, maintenance records, back-ups etc.) will be kept safely. Electronically backup of the data will be conducted on a daily basis. A hard copy backup of all relevant data will be printed out monthly. Calibration records for all instrumentation will be constantly collected and archived. All data and records required for verification are kept for two years after the end of the project crediting period or the last issuance of VERs, whichever is later.

Calibration Procedures:

The monitoring equipment calibration was carried out according to the information provided in the GS-VER PDD. The GS-VER PDD mainly includes the following obligation for the calibration of the appropriate meters:

Maintenance and calibration of measurement devices: According to manufacturer specifications, all measurement devices will be purchased and maintained as specified in the CDM monitoring manual. All measurement devices that are used in monitoring will be subject to a quality control procedure that will include regular maintenance and calibration in agreement with legal and/or manufacturer requirements. According to the relevant regulation, "The Turkish Electricity Market Regulation Agency (EPDK) sets rules on the accuracy of electricity meters that are used by power plants feeding into the grid. The rules are part of the EPDK regulation 25056 from 22/03/2003[3]. The table in Article 11 of the regulation specifies electricity meters of the accuracy class 0.5S for power plants between 10 MW and 100 MW and refers to compliance with the International Electrotechnical Commission's norm EN 60687. TEIAS, whose employees visit the plant for the meter readings monthly, is in charge of ensuring the adherence to these rules. Calibration and maintenance procedures follow the requirements."

If any equipment has a malfunction or breakdown, corrective actions are carried out in a timely manner to minimize the risk of emissions that are not intended. To ensure data quality, operational staff will be trained appropriately so that they can effectively take action in such cases. The plant operator periodically inspects the plant to check visually if there are any obvious problems. In case of any findings, these are documented.

In case of an organizational change within the Project owner, a qualified person will be assigned to carry out and manage the monitoring and verification procedures. In case of fire, earthquake or another similar emergency situation, the Project owner's data as

[3] http://www.epdk.gov.tr/documents/elektrik/mevzuat/teblig/elektrik/sayaclar_hakkinda/Elk_Tblg_Sayaclar.doc, page 3.

backup stores will be used, which will maintain conservativeness with specific procedures. For extraordinary events where such backup data are not available, the amount of landfill gas consumed will be calculated using the power generation figures and engines' full load electrical efficiencies by using conservative values and other assumptions to maintain conservativeness. Regarding the project emissions from flaring, data recording and aggregation and procedures for extraordinary events are the same as described above (i.e. the methane destruction component).

SECTION D. DATA AND PARAMETERS

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

Relevant SDG Indicator	13.3.1 Extent to which (i) global citizenship education and (ii) education for sustainable development are mainstreamed in (a) national education policies; (b) curricula; (c) teacher education; and (d) student assessment
Data/Parameter	Wx
Unit	Ton
Description	Quantity of MSW landfilled during 1996~2012
Source of data	Landfill gas power generation report of Kayseri Molu Landfill gas project
Value(s) applied	See section B.6.3 of PDD and Molu Calculation sheet
Choice of data or measurement methods and procedures	The data is provided in the report of landfill gas power generation report and this data is used to for calculation of energy generation. The date of waste is also confirmed by representative of waste department in Municipality.
Purpose of data/parameter	To calculate baseline emissions from the SWDS.
Additional comments	-

Relevant SDG Indicator	13.3.1 Extent to which (i) global citizenship education and (ii) education for sustainable development are mainstreamed in (a) national education policies; (b) curricula; (c) teacher education; and (d) student assessment
Data/Parameter	GWP_{CH4}
Unit	tCO_2e/tCH_4
Description	Global warming potential of CH4
Source of data	IPCC Fourth Assessment Report: AR_4 IPCC Fifth Assessment Report: AR_5
Value(s) applied	25 for the year 2019 and 2020 (Please see https://www.ipcc.ch/site/assets/uploads/2018/02/ar4-wg1-chapter2-1.pdf) 28 for 2021 (Please see https://www.ipcc.ch/site/assets/uploads/2018/02/WG1AR5_Chapter08_FINAL.pdf)
Choice of data or measurement methods and procedures	Default value. No measurement methods and procedures are necessary.

Purpose of data/parameter	To calculate baseline emissions due to methane from the SWDS
Additional comments	

Relevant SDG Indicator	13.3.1 Extent to which (i) global citizenship education and (ii) education for sustainable development are mainstreamed in (a) national education policies; (b) curricula; (c) teacher education; and (d) student assessment
Data/Parameter	D_{CH4}
Unit	tCH_4/m^3tCH_4
Description	Methane Density
Source of data	"Methodological Tool – Project Emissions from Flaring" Version 04.0
Value(s) applied	At standard temperature and pressure (0 degree Celsius and 1,013 bar) the density of methane is 0.0007168 tCH_4/ m^3tCH_4
Choice of data or measurement methods and procedures	Default value. No measurement methods and procedures are necessary.
Purpose of data/parameter	To calculate baseline emissions due to methane from the SWDS
Additional comments	

Relevant SDG Indicator	13.3.1 Extent to which (i) global citizenship education and (ii) education for sustainable development are mainstreamed in (a) national education policies; (b) curricula; (c) teacher education; and (d) student assessment
Data/Parameter	Φ
Unit	-
Description	Default value for the model correction factor to account for model uncertainties
Source of data	"Methodological Tool: Emissions from solid waste disposal sites" (Version 06.0.0)
Value(s) applied	0.75 For baseline emissions: refer to Table 3 of PDD to identify the appropriate factor based on the application of the tool (A or B) and the climate where the SWDS is located

Default values for the model correction factor	**Humid/wet conditions**	**Dry conditions**
Application A	**0.75**	**0.75**
Application B	**0.85**	**0.80**

Choice of data or measurement methods and procedures	Oonk et el. (1994) have validated several landfill gas models based on 17 realized landfill gas projects. The mean relative error of multi-phase models was assessed to be 18%. Given the uncertainties associated with the model and in order to estimate emission reductions in a conservative manner, a discount of 10% is applied to the model results.
Purpose of data/parameter	To calculate baseline emissions due to methane from the SWDS
Additional comments	

Relevant SDG Indicator	13.3.1 Extent to which (i) global citizenship education and (ii) education for sustainable development are mainstreamed in (a) national education policies; (b) curricula; (c) teacher education; and (d) student assessment
Data/Parameter	OX
Unit	-
Description	Oxidation factor (reflecting the amount of methane from SWDS that is oxidized in the soil or other material covering the waste)
Source of data	2006 IPCC Guidelines for National Greenhouse Gas Inventories, Vol. 5 Waste, Table 3.2.
Value(s) applied	0.1
Choice of data or measurement methods and procedures	As the landfill was covered by soil, the default value for oxidation could be applied. Default value. No measurement methods and procedures are necessary.
Purpose of data/parameter	To calculate baseline emissions due to methane from the SWDS
Additional comments	-

Relevant SDG Indicator	13.3.1 Extent to which (i) global citizenship education and (ii) education for sustainable development are mainstreamed in (a) national education policies; (b) curricula; (c) teacher education; and (d) student assessment
Data/Parameter	F
Unit	-
Description	Fraction of methane in the SWDS gas (volume fraction)
Source of data	2006 IPCC Guidelines for National Greenhouse Gas Inventories, Vol. 5 Waste,
Value(s) applied	0.5
Choice of data or measurement methods and procedures	Default value. No measurement methods and procedures are necessary.

Purpose of data/parameter	To calculate baseline emissions due to methane from the SWDS
Additional comments	

Relevant SDG Indicator	13.3.1 Extent to which (i) global citizenship education and (ii) education for sustainable development are mainstreamed in (a) national education policies; (b) curricula; (c) teacher education; and (d) student assessment
Data/Parameter	DOC_f
Unit	Weight fraction
Description	Default value for the fraction of degradable organic carbon (DOC) in MSW that decomposes in the SWDS.
Source of data	2006 IPCC Guidelines for National Greenhouse Gas Inventories, Vol. 5 Waste,
Value(s) applied	0.5
Choice of data or measurement methods and procedures	Based on the methodological tool "Emissions from solid waste disposal sites" version 06.0.0", this factor reflects the fact that some degradable organic carbon degrades very slowly, under anaerobic conditions in the SWDS. A default value of 0.5 is recommended by IPCC.
Purpose of data/parameter	To calculate baseline emissions due to methane from the SWDS
Additional comments	

Relevant SDG Indicator	13.3.1 Extent to which (i) global citizenship education and (ii) education for sustainable development are mainstreamed in (a) national education policies; (b) curricula; (c) teacher education; and (d) student assessment
Data/Parameter	MCF
Unit	-
Description	Methane correction factor
Source of data	2006 IPCC Guidelines for National Greenhouse Gas Inventories, Vol. 5 Waste, Table 3.1
Value(s) applied	0.8

Choice of data or measurement methods and procedures	The methane correction factor (MCF) accounts for the fact that unmanaged SWDS produce less methane from a given amount of waste than managed SWDS, because a larger fraction of waste decomposes aerobically in the top layers of unmanaged SWDS. Based on the "Tool: Emissions from solid waste disposal sites", IPPC default value for **unmanaged solid waste disposal sites.** This comprises all SWDS not meeting the criteria of managed SWDS and which have depths of greater than or equal to 5 meters.[4]
Purpose of data/parameter	To calculate baseline emissions due to methane from the SWDS
Additional comments	

Relevant SDG Indicator	13.3.1 Extent to which (i) global citizenship education and (ii) education for sustainable development are mainstreamed in (a) national education policies; (b) curricula; (c) teacher education; and (d) student assessment
Data/Parameter	DOC_j
Unit	-
Description	Fraction of degradable organic carbon (by weight) in the waste type j
Source of data	2006 IPCC Guidelines for National Greenhouse Gas Inventories, Vol. 5 Waste, Tables 2.4 and 2.5.
Value(s) applied	

Waste type j	DOC_j (% wet waste)	DOC_j (% dry waste)
Wood and wood products	43	50
Pulp, paper and cardboard (other than sludge)	40	44
Food, food waste, beverages and tobacco (other than sludge)	15	38
Textiles	24	30
Garden, yard and park waste	20	49
Glass, plastic, metal, other inert waste	0	0

[4] Landfill gas power generation report of Kayseri Molu Landfill.

Choice of data or measurement methods and procedures	MAP/PET<1 for province of Kayseri, thus **dry** values are used in accordance to "the tool Emissions from solid waste disposal sites" version 6.0.0 and 2006 IPCC Guidelines for National Greenhouse Gas Inventories, Vol. 5 Waste, Tables 2.4 and 2.5.
Purpose of data/parameter	To calculate baseline emissions due to methane from the SWDS
Additional comments	0.40 (kitchen waste), 0.03 (paper & carton), 0.08 (textiles), 0.03 (wood), 0.10 (garden/fruits), 0.36 (glass, plastic, metal, other inert waste)[5]

Relevant SDG Indicator	13.3.1 Extent to which (i) global citizenship education and (ii) education for sustainable development are mainstreamed in (a) national education policies; (b) curricula; (c) teacher education; and (d) student assessment
Data/Parameter	k_j
Unit	-
Description	Decay rate for the waste type j
Source of data	2006 IPCC Guidelines for National Greenhouse Gas Inventories, Vol. 5 Waste, Table 3.3.

[5] Kayseri-Ergebnisbericht-Deponie und Gasprognos.page: 18.

<table>
<tr><td>Value(s) applied</td><td>0.04 (paper & carton), 0.04 (textiles), 0.02 (wood), 0.05 (garden & park wastes), 0.06 (food)
<table>
<tr><td colspan="2" rowspan="2">Waste type j</td><td colspan="2">Boreal and Temperate (MAT ≤ 20 °C)</td><td colspan="2">Tropical (MAT ≥ 20 °C)</td></tr>
<tr><td>Dry ☐MAP/PET < 1)</td><td>Wet (MAP/PET > 1)</td><td>Dry (MAP < 1000 mm)</td><td>Wet ☐MAP > 1000)</td></tr>
<tr><td rowspan="2">Slowly Degrading</td><td>Pulp, paper, cardboard (other than sludge, textiles)</td><td>0.04</td><td>0.06</td><td>0.045</td><td>0.07</td></tr>
<tr><td>Wood, wood products and straw</td><td>0.02</td><td>0.03</td><td>0.025</td><td>0.035</td></tr>
<tr><td>Moderately Degrading</td><td>Other (non-food) organic putrescible garden and park waste</td><td>0.05</td><td>0.10</td><td>0.065</td><td>0.17</td></tr>
<tr><td>Rapidly Degrading</td><td>Food, food waste, sewage sludge, beverages and tobacco</td><td>0.06</td><td>0.185</td><td>0.085</td><td>0.40</td></tr>
</table></td></tr>
<tr><td>Choice of data or measurement methods and procedures</td><td>For Kayseri region:
Medium Average temperature MAT [°C]: 10.5
Medium Average Precipitation MAP [mm/y]: 393
Potential Evapotraspiration PET [mm/y]:438
Thus, MAP/PET<1
Source for MAP :
http://www.mgm.gov.tr/veridegerlendirme/yillik-toplam-yagis-verileri.aspx?m=KAYSERI#sfB
Source for PET:
http://www.mgm.gov.tr/veridegerlendirme/acik-yuzey-buharlasma.aspx</td></tr>
<tr><td>Purpose of data/parameter</td><td>To calculate baseline emissions due to methane from the SWDS</td></tr>
<tr><td>Additional comments</td><td></td></tr>
</table>

Relevant SDG Indicator	13.3.1 Extent to which (i) global citizenship education and (ii) education for sustainable development are mainstreamed in (a) national education policies; (b) curricula; (c) teacher education; and (d) student assessment
Data/Parameter	η_{PJ}
Unit	Dimensionless
Description	Efficiency of the LFG capture system that will be installed in the project activity
Source of data	The methodology ACM0001 Version 13.
Value(s) applied	50%
Choice of data or measurement methods and procedures	While there are different values in regards of efficiency of LFG capture system due to difference in disposal sites. The default value of 50% is applied fort he Project.
Purpose of data/parameter	To calculate baseline emissions due to methane from the SWDS
Additional comments	

Relevant SDG Indicator	13.3.1 Extent to which (i) global citizenship education and (ii) education for sustainable development are mainstreamed in (a) national education policies; (b) curricula; (c) teacher education; and (d) student assessment
Data/Parameter	fy
Unit	-
Description	Fraction of methane captured at the SWDS and flared, combusted or used in another manner that prevents the emissions of methane to the atmosphere in year y
Source of data	Methodology ACM0001 Version 13
Value(s) applied	0
Choice of data or measurement methods and procedures	Default value. No measurement methods and procedures are necessary.
Purpose of data/parameter	To calculate baseline emissions due to methane from the SWDS
Additional comments	According Methodology ACM0001 Version 13, "0" is applied.

Relevant SDG Indicator	13.3.1 Extent to which (i) global citizenship education and (ii) education for sustainable development are mainstreamed in (a) national education policies; (b) curricula; (c) teacher education; and (d) student assessment
Data/Parameter	Gross electricity generation
Unit	MWh
Description	Gross Electricity supplied to the grid by relevant sources (2008-2010)
Source of data	Turkish Electricity Transmission Company (TEIAS), Annual Development of Turkey's Gross Electricity Generation of Primary Energy Resources (1975-2010) TEIAS, see: https://webapi.teias.gov.tr/file/cfd34f31-0bfd-4a06-8346-efb33285e44c?download
Value(s) applied	See table 11 of PDD
Choice of data or measurement methods and procedures	TEIAS is the national electricity transmission company, which makes available the official data of all power plants in Turkey.
Purpose of data/parameter	To calculate emission factor of the national grid.
Additional comments	

Relevant SDG Indicator	13.3.1 Extent to which (i) global citizenship education and (ii) education for sustainable development are mainstreamed in (a) national education policies; (b) curricula; (c) teacher education; and (d) student assessment
Data/Parameter	Net electricity generation
Unit	MWh
Description	Net electricity fed into the grid. Used for the calculation of the net/gross relation (Including Import and Export figures)
Source of data	Turkish Electricity Transmission Company (TEIAS), Annual Development of Electricity Generation-Consumption and Losses in Turkey (1984-2010) TEIAS, https://webapi.teias.gov.tr/file/cfd34f31-0bfd-4a06-8346-efb33285e44c?download
Value(s) applied	See table 11 of PDD

Choice of data or measurement methods and procedures	This data is used to find relation between the gross and net electricity delivered to the grid by fossil fuel fired power plants (Table 11). Import and Export data is used to find total net electricity fed into the grid in the years of 2008, 2009 and 2010 (table 12) TEIAS is the national electricity transmission company, which makes available the official data of all power plants in Turkey.
Purpose of data/parameter	To calculate emission factor of the national grid.
Additional comments	

Relevant SDG Indicator	13.3.1 Extent to which (i) global citizenship education and (ii) education for sustainable development are mainstreamed in (a) national education policies; (b) curricula; (c) teacher education; and (d) student assessment
Data/Parameter	$HV_{i,y}$
Unit	Mass or volume unit
Description	Heating Values of fuels consumed for electricity generation in the years of 2007, 2008, 2009 and 2010
Source of data	Heating Values Of Fuels Consumed In Thermal Power Plants In Turkey By The Electric Utilities, TEİAŞ. See: https://webapi.teias.gov.tr/file/780b9f4b-7e97-4e64-a264-20669a820b79?download
Value(s) applied	See table 21 of PDD
Choice of data or measurement methods and procedures	TEİAŞ is the national electricity transmission company, which makes available the official data of all power plants in Turkey. There is no national NCV data in Turkey. However, TEİAŞ announces Heating values of fuels. This data is used to calculate annual NCVs for each fuel type.
Purpose of data/parameter	To calculate emission factor of the national grid.
Additional comments	

Relevant SDG Indicator	13.3.1 Extent to which (i) global citizenship education and (ii) education for sustainable development are mainstreamed in (a) national education policies; (b) curricula; (c) teacher education; and (d) student assessment
Data/Parameter	$FC_{i,y}$
Unit	Mass or volume unit

Description	Fuels consumed for electricity generation in the years of 2008, 2009 and 2010
Source of data	Annual Development of Fuels Consumed In Thermal Power Plants In Turkey By The Electric Utilities, TEİAŞ. See: https://webapi.teias.gov.tr/file/69279fb3-a945-4066-a772-26d6a9ee15f9?download
Value(s) applied	See table 22 of PDD
Choice of data or measurement methods and procedures	TEİAŞ is the national electricity transmission company, which makes available the official data of all power plants in Turkey.
Purpose of data/parameter	To calculate emission factor of the national grid.
Additional comments	

Relevant SDG Indicator	13.3.1 Extent to which (i) global citizenship education and (ii) education for sustainable development are mainstreamed in (a) national education policies; (b) curricula; (c) teacher education; and (d) student assessment
Data/Parameter	$NCV_{i,y}$
Unit	TJ/kton, TJ/million m^3
Description	Net Calorific Value of fuel types in the years of 2008, 2009 and 2010
Source of data	Calculated by using HVi,y to FCi,y as Net Calorific Values of fuel types are not directly available in Turkey.
Value(s) applied	See table 23 of PDD
Choice of data or measurement methods and procedures	TEİAŞ is the national electricity transmission company, which makes available the official data of power plants in Turkey. Calculation of NCVs from national $HV_{i,y}$ and $FC_{i,y}$ data, Table 22 and Table 23, is preferred to default IPCC data as these are more reliable.
Purpose of data/parameter	To calculate emission factor of the national grid.
Additional comments	

Relevant SDG Indicator	13.3.1 Extent to which (i) global citizenship education and (ii) education for sustainable development are mainstreamed in (a) national education policies; (b) curricula; (c) teacher education; and (d) student assessment
Data/Parameter	Sample Group for BM emission factor
Unit	Name of the plants, MW capacities, fuel types, annual electricity generations and dates of commissioning.
Description	Most recent power plants which compromise 20% of total generation

Source of data	Annual Development of Fuels Consumed in Thermal Power Plants in Turkey by the Electric Utilities, TEIAS: For plants in 2006: http://www.epdk.gov.tr/documents/10157/70d5f8ce-9da8-44c4-bef8-84b7505dccc3 (page 76 and 77 for installed power of new plants, page 67-75 for generation amounts. For capacity additions, interpolation method is used for generation amounts) For plants in 2007: www.teias.gov.tr/projeksiyon/KAPASITEPROJEKSIYONU2008.pdf (page 121 and 122 for installed power of new plants, page 111-120 for generation amounts. For capacity additions, interpolation method is used for generation amounts) For plants in 2008: http://www.teias.gov.tr/projeksiyon/KAPASITEPROJEKSIYONU2009.pdf (page 95 for plants and pages 82-94 for generation amounts. For capacity additions, interpolation method is used for generation amounts) For Plants in 2009: http://www.teias.gov.tr/projeksiyon/KAPASITE%20PROJEKSIYONU%202010.pdf (page 98-100 for plants and pages 85-97 for generation amounts. For capacity additions, interpolation method is used for generation amounts) For Plants in 2010: http://www.epdk.org.tr/documents/10157/8edb1470-7667-4ce1-8ce5-21d1ce4e4761 (Page 101-106 for 2010 Plants and Pages 88-101 for Fuel Types and Generation Amounts)
Value(s) applied	See table 25 of PDD
Choice of data or measurement methods and procedures	TEIAS is the national electricity transmission company, which makes available the official data of all power plants in Turkey.
Purpose of data/parameter	To calculate emission factor of the national grid.
Additional comments	

Relevant SDG Indicator	13.3.1 Extent to which (i) global citizenship education and (ii) education for sustainable development are mainstreamed in (a) national education policies; (b) curricula; (c) teacher education; and (d) student assessment
Data/Parameter	EF_i
Unit	tCO_2/GJ
Description	Emission factor for fuel type *I*

Source of data	IPCC default values at the lower limit of the uncertainty at a 95% confidence interval as provided in table 1.4 of Chapter1 of Vol. 2 (Energy) of the IPCC Guidelines on National GHG Inventories. http://www.ipcc-nggip.iges.or.jp/public/2006gl/pdf/2_Volume2/V2_1_Ch1_Introduction.pdf
Value(s) applied	See table 24 of PDD
Choice of data or measurement methods and procedures	No plant specific and national emission factor data is available in Turkey. So, IPCC default data is used. For Fuel Oil Power Plants: 'Gas/Diesel Oil' data is used for conservativeness. For Coal Power Plants: In the 205th page of official document given in the link below, it is stated that Çolakoğlu and İçdaş utilizes 'Taşkömürü' (Hardcoal). And at the Table-2 in page 157 of the same document, Taşkömürü is divided in two groups: Bituminous and Antharcite. Since Sub-Bituminous Coal is under Brown Coal in the same table and since Other Bituminous Coal has lower EF than Anthracite in 1.4 of IPCC Guidelines, EF for 'Other Bituminous Coal' is used. See: http://www.dpt.gov.tr/DocObjects/Icerik/4225/Enerji_Hammaddeleri_(Linyit_Taskömuru-Jeotermal)
Purpose of data/parameter	To calculate emission factor of the national grid.
Additional comments	

Relevant SDG Indicator	13.3.1 Extent to which (i) global citizenship education and (ii) education for sustainable development are mainstreamed in (a) national education policies; (b) curricula; (c) teacher education; and (d) student assessment
Data/Parameter	$\eta_{i,y}$
Unit	-
Description	Average energy conversion efficiency of power unit m in year y
Source of data	TEİAŞ and Annex I of the "Tool to calculate the emission factor for an electricity system"
Value(s) applied	See Table 16 of PDD

Choice of data or measurement methods and procedures	For Lignite and Coal power plants, plants specific values are applied. There are two lignite power plant in Sample Group. These are Çan and Elbistan PPs. For efficiency factor of Çan PP is taken form presentation of Mr. Sefer Bütün (General Manager of EUAS, state production company), which is 'Thermal Power Plants and Environment'. This presentation is submitted to DOE. In the page 18 of the presentation, it is stated that for pulverized lignite power plants the highest achieved electrical efficiency rate is 38%. So this rate is applied also for Elbistan-B PP. Weighted average of these efficiency rates, which turns to be 38.63% is used for lignite power plants. For coal power plants, the highest efficiency rate for 'fluidized bed' technology which is 41.5% for PFBS is applied as coal PPs in the sample group (Çolakoğlu (Capacity Increment) and Çan Gr I-II) are utilizing fluidized bed type technology. For reference see: http://www.mimag-samko.com.tr/akiskan_yatakli_kazanlar.pdf (last paragraph of page 6) For Natural Gas and Oil plants efficiencies, default value given in the tool is applied: http://cdm.unfccc.int/methodologies/Tools/EB35_repan12_Tool_grid_emission.pdf
Purpose of data/parameter	To calculate emission factor of the national grid.
Additional comments	

Relevant SDG Indicator	13.3.1 Extent to which (i) global citizenship education and (ii) education for sustainable development are mainstreamed in (a) national education policies; (b) curricula; (c) teacher education; and (d) student assessment
Data/Parameter	R_u
Unit	$Pa.m^3/kmol.K$
Description	Universal ideal gas constant
Source of data	Methodological Tool "Tool to determine the mass flow of a greenhouse gas in a gaseous stream" Version 02.0.0
Value(s) applied	8.314
Choice of data or measurement methods and procedures	Default value. No measurement methods and procedures are necessary.
Purpose of data/parameter	To calculate baseline emissions due to methane from the SWDS
Additional comments	

Relevant SDG Indicator	13.3.1 Extent to which (i) global citizenship education and (ii) education for sustainable development are mainstreamed in (a) national education policies; (b) curricula; (c) teacher education; and (d) student assessment
Data/Parameter	MM_{CH4}
Unit	kg/kmol
Description	Molecular mass of greenhouse gas (CH4)
Source of data	Methodological Tool "Tool to determine the mass flow of a greenhouse gas in a gaseous stream" Version 02.0.0
Value(s) applied	16.04
Choice of data or measurement methods and procedures	Default value. No measurement methods and procedures are necessary.
Purpose of data/parameter	To calculate baseline emissions due to methane from the SWDS
Additional comments	

Relevant SDG Indicator	13.3.1 Extent to which (i) global citizenship education and (ii) education for sustainable development are mainstreamed in (a) national education policies; (b) curricula; (c) teacher education; and (d) student assessment
Data/Parameter	P_n
Unit	Pa
Description	Total pressure at normal conditions
Source of data	Methodological Tool "Tool to determine the mass flow of a greenhouse gas in a gaseous stream" Version 02.0.0
Value(s) applied	101.325 Pa
Choice of data or measurement methods and procedures	Default value. No measurement methods and procedures are necessary.
Purpose of data/parameter	To calculate baseline emissions due to methane from the SWDS
Additional comments	

Relevant SDG Indicator	13.3.1 Extent to which (i) global citizenship education and (ii) education for sustainable development are mainstreamed in (a) national education policies; (b) curricula; (c) teacher education; and (d) student assessment
Data/Parameter	T_n
Unit	K
Description	Temperature at normal conditions

Source of data	Methodological Tool "Tool to determine the mass flow of a greenhouse gas in a gaseous stream" Version 02.0.0
Value(s) applied	273.15 K
Choice of data or measurement methods and procedures	Default value. No measurement methods and procedures are necessary.
Purpose of data/parameter	To calculate baseline emissions due to methane from the SWDS
Additional comments	

Relevant SDG Indicator	13.3.1 Extent to which (i) global citizenship education and (ii) education for sustainable development are mainstreamed in (a) national education policies; (b) curricula; (c) teacher education; and (d) student assessment
Data/Parameter	$EF_{grid,CM,y}$.
Unit	tCO_2/MWh
Description	Combined Margin Emission factor for Turkish electricity grid
Source of data	Registered PDD
Value(s) applied	0.5313 tCO2/MWh
Choice of data or measurement methods and procedures	Default value. No measurement methods and procedures are necessary.
Purpose of data/parameter	Calculation of baseline emission.
Additional comments	

In addition, the following constants - as provided in the "Tool to determine project emissions from flaring gases containing methane" (EB 28, Meeting report Annex 13, page 11/12) - are used in the equations 5-19.

Table 5: Constants and default values used in equations to determine project emissions from flaring gases

Parameter	Unit	Description	Value
MM_{CH4}	kg/kmol	Molecular mass of methane	16.04
MM_{CO}	kg/kmol	Molecular mass of carbon monoxide	28.01
MM_{CO2}	kg/kmol	Molecular mass of carbon dioxide	44.01
MM_{O2}	kg/kmol	Molecular mass of oxygen	32.00
MM_{H2}	kg/kmol	Molecular mass of hydrogen	2.02
MM_{N2}	kg/kmol	Molecular mass of nitrogen	28.02
AM_c	kg/kmol (g/mol)	Atomic mass of carbon	12.00
AM_H	kg/kmol (g/mol)	Atomic mass of hydrogen	1.01
AM_O	kg/kmol (g/mol)	Atomic mass of oxygen	16.00

AM_N	kg/kmol (g/mol)	Atomic mass of nitrogen	14.01
P_n	Pa	Atmospheric pressure at normal conditions	101.325
Ru	Pa m3/kmol K	Universal ideal gas constant	8.314
Tn	K	Temperature at normal conditions	273.15
MF_{O2}	Dimensionless	O_2 volumetric fraction of air	0.21
MV_n	m^3/kmol	Volume of one mole of any ideal gas at normal temperature and pressure	22.414
$\rho_{CH4,n}$	kg/m^3	Density of methane gas at normal conditions	0.716

D.2 Data and parameters monitored

Relevant SDG Indicator / Safeguarding Principle	13.3.1 Extent to which (i) global citizenship education and (ii) education for sustainable development are mainstreamed in (a) national education policies; (b) curricula; (c) teacher education; and (d) student assessment
Data / Parameter	Management of SWDS
Unit	-
Description	Management of SWDS
Source of data	One of the following sources can be used: •Original design of the landfill; •Technical specifications for the management of the SWDS; •Local or national regulations The transfer of the wastes and the management of the landfill is under the sole responsibility of the Kayseri Metropolitan Municipality so that the project proponent can't intervene with any design-related issues of the landfill.
Value(s) applied	There have been no changes to the design of the landfill. However, as a rule, peak gas production in landfills usually occurs from 5 to 7 years after the waste is buried.
Measurement methods and procedures	Visual inspection
Monitoring frequency	Annually
QA/QC procedures	-
Purpose of data	Calculation of baseline emission
Additional comments	Project participants refer to the original design of the landfill to ensure that any practice to increase methane generation has been occurring prior to the implementation of the project activity. Any change in the management of the SWDS after the implementation of the project activity would be justified by referring to technical or regulatory specifications.

Relevant SDG Indicator/ Safeguarding Principle	13.3.1 Extent to which (i) global citizenship education and (ii) education for sustainable development are mainstreamed in (a) national education policies; (b) curricula; (c) teacher education; and (d) student assessment
Data / Parameter	$F_{CH4,sent\ flare,y}$
Unit	t_{CH4} /y

<table>
<tr><td>Description</td><td>Amount of methane in LFG which is sent to the flare in year y</td></tr>
<tr><td>Source of data</td><td>Calculated based on the flow of LFG and the concentration of methane in the LFG that is sent to the flare(s)</td></tr>
<tr><td>Value(s) applied</td><td>For 2019: 1.27 tons
For 2020: 4.05 tons
For 2021: 8.83 tons
Total for the Monitoring Period: 14.16 tons</td></tr>
<tr><td>Measurement methods and procedures</td><td>Please see Section E.2 of this report. Tool 06 Project Emissions from Flaring is used for calculations. Measured by a flow meter and a gas analyzer. Data to be aggregated monthly and yearly
<table>
<tr><th colspan="7">Fıxed Gas Flow And Pressure Measurement Equıpment In Booster</th></tr>
<tr><th></th><th>Model</th><th>Manufactu rer</th><th>Serıal No.</th><th>Accuracy</th><th>Calıbrat ıon Freque ncy</th><th>Date Of Calıbratı on</th></tr>
<tr><td>Flow Meter</td><td>ORIFICE PLATE - DCMD200016CS 2011</td><td>TECNOVA HT</td><td>ABF 1701F</td><td>%0.1</td><td>10 years</td><td>21/12/2012

09/10/2020</td></tr>
</table></td></tr>
<tr><td>Monitoring frequency</td><td>Continuously</td></tr>
<tr><td>QA/QC procedures</td><td>Flowmeter is subject to regular (following the manufacturer) maintenance and testing to ensure accuracy.
The accuracy class: +-0.1</td></tr>
<tr><td>Purpose of data</td><td>Calculation of Project emission</td></tr>
<tr><td>Additional comments</td><td>-</td></tr>
</table>

Relevant SDG Indicator/ Safeguarding Principle	13.3.1 Extent to which (i) global citizenship education and (ii) education for sustainable development are mainstreamed in (a) national education policies; (b) curricula; (c) teacher education; and (d) student assessment
Data / Parameter	$F_{CH4,EL,y}$
Unit	$t_{CH4\ /y}$
Description	Amount of methane in LFG which is sent to the gas engine in year y
Source of data	Calculated based on the flow of LFG and the concentration of methane in the LFG that is sent to the gensets
Value(s) applied	For 2019: 5,028.87 tons For 2020: 5,526.10 tons For 2021: 5,624.60 tons Total for the Monitoring Period: 16,179.57 tons

<table>
<tr><td>Measurement methods and procedures</td><td>The details of the calculation is given in Section E.2 of this report. The following equation is applied.
$F_{CH4,EL,y} = LFG_{electricity,y} * w_{CH4} * D_{CH4}$
Measured by a flow meter and a gas analyzer. Data to be aggregated monthly and yearly
<table>
<tr><th colspan="7">FIXED GAS FLOW AND PRESSURE MEASUREMENT EQUIPMENT IN BOOSTER</th></tr>
<tr><th></th><th>MODEL</th><th>MANUFACTURER</th><th>SERIAL NO.</th><th>ACCURACY</th><th>CALIBRATION FREQUENCY</th><th>DATE of CALIBRATION</th></tr>
<tr><td>Flow Meter</td><td>ORIFICE PLATE - DCMD200016CS 2011</td><td>TECNOVA HT</td><td>ABF 1699F</td><td>%0.1</td><td>10 years</td><td>21/12/2012

09/10/2020</td></tr>
</table></td></tr>
<tr><td>Monitoring frequency</td><td>Continuously</td></tr>
<tr><td>QA/QC procedures</td><td>Flow meter is subject to regular (in accordance to the manufacturer) maintenance and testing to ensure accuracy.</td></tr>
<tr><td>Purpose of data</td><td>Calculation of Project emission reduction</td></tr>
<tr><td>Additional comments</td><td>Amount of methane in LFG which is sent to the flare in year y</td></tr>
</table>

Relevant SDG Indicator/ Safeguarding Principle	13.3.1 Extent to which (i) global citizenship education and (ii) education for sustainable development are mainstreamed in (a) national education policies; (b) curricula; (c) teacher education; and (d) student assessment
Data / Parameter	$V_{t,db}$
Unit	m^3 dry gas/h
Description	Volumetric flow of the gaseous stream in the hour *h* on a dry basis
Source of data	PLC (Measured based on the flow of LFG)
Value(s) applied	For 2019: 12,703,997.09 Nm^3 For 2020: 13,939,374.24 Nm^3 For 2021: 14,544,067.70 Nm^3 Total for the Monitoring Period: 41,187,439.03 Nm^3

<table>
<tr><td>Measurement methods and procedures</td><td>Measured by a flow meter. Data will be aggregated monthly and yearly. Volumetric flow measurement should always refer to the actual pressure and temperature.
<table>
<tr><th colspan="7">FIXED GAS FLOW AND PRESSURE MEASUREMENT EQUIPMENT IN BOOSTER</th></tr>
<tr><th></th><th>MODEL</th><th>MANUFACTURER</th><th>SERIAL NO.</th><th>ACCURACY</th><th>CALIBRATION FREQUENCY</th><th>DATE of CALIBRATION</th></tr>
<tr><td>Flow Meter</td><td>ORIFICE PLATE - DCMD200016CS 2011</td><td>TECNOVA HT</td><td>ABF 0859F</td><td>%0.1</td><td>10 years</td><td>21/12/2012

09/10/2020</td></tr>
<tr><td>Flow meter Booster 2</td><td>2014</td><td>TECNOVA HT</td><td>AEJ2006F</td><td>%0.1</td><td>10 years</td><td>26/09/2014</td></tr>
</table></td></tr>
<tr><td>Monitoring frequency</td><td>Continuous. The measurement interval will be equal to or more than one sampling each hour. (average value in a time interval not greater than an hour will be used in the calculations of emission reductions). Measured by a flow meter, which is a turbine system with a special internal shell for biogas, completed with a volume checker and a fiscal converter of frequency. Meter will provide a minimum accuracy of +/- 1% by volume.</td></tr>
<tr><td>QA/QC procedures</td><td>Periodic calibration against a primary device provided by an independent accredited laboratory is mandatory. Calibration and frequency of calibration are according to the manufacturer’s specifications</td></tr>
<tr><td>Purpose of data</td><td>Calculation of Project emission reduction</td></tr>
<tr><td>Additional comments</td><td>Temperature and pressure are automatically measured, and LFG volumes are expressed in normalised cubic meters</td></tr>
</table>

Relevant SDG Indicator/ Safeguarding Principle	13.3.1 Extent to which (i) global citizenship education and (ii) education for sustainable development are mainstreamed in (a) national education policies; (b) curricula; (c) teacher education; and (d) student assessment
Data / Parameter	$V_{CH4,db,t,}$
Unit	m^3 CH4/ m^3 dry gas
Description	Volumetric flow of CH4 in time interval on a dry basis
Source of data	PLC (Measured based on the flow of LFG)
Value(s) applied	For 2019: 55.43% For 2020: 55.53% For 2021: 53.96% Average for the Monitoring Period: 54.97 %
Measurement methods and procedures	Continuous gas analyzer operating in dry-basis. Volumetric flow measurement refers to the actual pressure and temperature. Data will be aggregated monthly and yearly.
Monitoring frequency	Continuous. The measurement interval will be equal to or more than one sampling each hour (average value in a time interval not greater than an hour will be used in the calculations of emission reductions) Measured by a flow meter, which is a turbine system, with a special internal shell for biogas, completed with a volume checker and a fiscal converter of frequency. Meter will provide a minimum accuracy of +/- 1% by volume.

QA/QC procedures	Periodic calibration against a primary device provided by an independent accredited laboratory is mandatory. Calibration and frequency of calibration is according to manufacturer's specifications
Purpose of data	Calculation of Project emission reduction
Additional comments	Temperature and pressure are automatically measured, and LFG volumes are expressed in normalized cubic meters. Gas analysers provide values every 10 minutes so that the value given here (54.85%) is just an average value of the methane concentrations every 10 minutes. Please see Column F of Baseline Emissions Methane sheet and Column C of Emission Reductions sheet from ER workbook.

Relevant SDG Indicator/ Safeguarding Principle	13.3.1 Extent to which (i) global citizenship education and (ii) education for sustainable development are mainstreamed in (a) national education policies; (b) curricula; (c) teacher education; and (d) student assessment
Data / Parameter	T_t
Unit	C
Description	Temperature of the landfill gas
Source of data	PLC (Thermometer)
Value(s) applied	48.044
Measurement methods and procedures	Continuous temperature analyzer operating in dry-basis.
Monitoring frequency	Continuous. The measurement interval will be equal to or more than one sampling each hour (average value in a time interval not greater than an hour will be used in the calculations of emission reductions) All the data will be aggregated hourly, daily, monthly and yearly.
QA/QC procedures	The device is subject to regular maintenance and testing regime to ensure accuracy. They are periodically calibrated according to the manufacturer's recommendation by project participants. Accuracy +/- 0,065%
Purpose of data	Calculation of Project emission reduction
Additional comments	-

Relevant SDG Indicator/ Safeguarding Principle	13.3.1 Extent to which (i) global citizenship education and (ii) education for sustainable development are mainstreamed in (a) national education policies; (b) curricula; (c) teacher education; and (d) student assessment
Data / Parameter	Pt
Unit	Pa or mbar
Description	Pressure of the gaseous stream in the hour *h*
Source of data	Manometer
Value(s) applied	107.654 mbar

<table>
<tr><td>Measurement methods and procedures</td><td>Continuous on dry-basis. Instruments with recordable electronic signal (analogical or digital) are required. Examples include pressure transducers, etc. Manometer (Pressure gauge)
<table>
<tr><th colspan="7">FIXED GAS FLOW AND PRESSURE MEASUREMENT EQUIPMENT IN BOOSTER</th></tr>
<tr><th></th><th>MODEL</th><th>MANUFACTURER</th><th>SERIAL NO.</th><th>ACCURACY</th><th>CALIBRATION FREQUENCY</th><th>DATE of CALIBRATION</th></tr>
<tr><td>Pressure meter 1</td><td>FCX-FKP – FKGT01V5AMCYYAA1YY 2011</td><td>FUJI ELECTRIC</td><td>D6500B-3/84447450</td><td>0,065% OF FULL SCALE</td><td>10 years</td><td>01/08/2011

09/10/2020</td></tr>
<tr><td>Pressure meter 2</td><td>FKCT22V5AKCYYAA2YY 2014</td><td>FUJI ELECTRIC</td><td>KEMA 08ATEX0120 X</td><td>0,065% OF FULL SCALE</td><td>10 years</td><td>04/09/2014</td></tr>
</table></td></tr>
<tr><td>Monitoring frequency</td><td>Continuous.</td></tr>
<tr><td>QA/QC procedures</td><td>The device is subject to regular maintenance and testing regime to ensure accuracy. They are periodically calibrated according to the manufacturer’s recommendation by project participants. The range is 0-250.</td></tr>
<tr><td>Purpose of data/parameter</td><td>Calculation of Project emission reduction</td></tr>
<tr><td>Additional comments</td><td>-</td></tr>
</table>

Relevant SDG Indicator/ Safeguarding Principle	13.3.1 Extent to which (i) global citizenship education and (ii) education for sustainable development are mainstreamed in (a) national education policies; (b) curricula; (c) teacher education; and (d) student assessment
Data / Parameter	$TDL_{k,y}$
Unit	-
Description	Average technical transmission and distribution losses for providing electricity to source k in year y
Source of data	TEİAŞ,2020, Türkiye elektrik enerjisi üretim - tüketim ve kayiplarinin yillar itibariyle gelişimi https://webapi.teias.gov.tr/file/e15261ce-c442-4fb6-ae82-25a690d85fd1?download
Value(s) applied	10.5%.
Measurement methods and procedures	Default value per “Tool to calculate baseline, project and or leakage emission from electricity consumption” version 01.
Monitoring frequency	Once each verification
QA/QC procedures	-
Purpose of data	Calculation of Project emission reduction
Additional comments	Due to the fact that EPIAS publishes the electricity generation and consumption data taking into account the transmission distribution losses (i.e. Kayipli Veris & Kayipli Cekis), the calculations carried out in the ER excel already account for the losses. So this value 10.5% was not employed in the calculations in the ER excel workbook.

Relevant SDG Indicator/ Safeguarding Principle	13.3.1 Extent to which (i) global citizenship education and (ii) education for sustainable development are mainstreamed in (a) national education policies; (b) curricula; (c) teacher education; and (d) student assessment
Data / Parameter	$PE_{flare,y}$
Unit	tCO_2e
Description	Project emissions from flaring of the residual gas stream in year y
Source of data	Calculated as per the "Tool to determine project emissions from flaring gases containing methane" (EB 28, Report Annex 13)
Value(s) applied	For 2019: 32 tCO_2e For 2020: 102 tCO_2e For 2021: 248 tCO_2e Total for the Monitoring Period: 382 tCO_2e
Measurement methods and procedures	Calculated as per the "Tool to determine project emissions from flaring gases containing methane" (EB 28, Report Annex 13)
Monitoring frequency	N/A
QA/QC procedures	Flowmeter is subject to regular (in accordance with the manufacturer) maintenance and testing to ensure accuracy. The accuracy class: +-0.1
Purpose of data	Calculation of Project emission reduction
Additional comments	-

Relevant SDG Indicator/ Safeguarding Principle	13.3.1 Extent to which (i) global citizenship education and (ii) education for sustainable development are mainstreamed in (a) national education policies; (b) curricula; (c) teacher education; and (d) student assessment
Data / Parameter	$FC_{i,j,y}$
Unit	t/year
Description	Quantity of diesel combusted for auxiliary purposes
Source of data	Working hour of genset and perhour fuel consumption
Value(s) applied	For 2019: 0.0000 tons For 2020: 0.1572 tons For 2021: 0.1215 tons Total for the Monitoring Period: 0.2787 tons

<table>
<tr><td>Measurement methods and procedures</td><td>Fuel consumption is calculated using a mass balance approach based on the quantity of fuel purchased and the difference in the quantity held in stock.
<table>
<tr><th colspan="6">DIESEL GENERATOR</th></tr>
<tr><th>MODEL</th><th>MANUFACTURER</th><th>SERIAL NO.</th><th>POWER RATING</th><th>CALIBRATION FREQUENCY</th><th>DATE of CALIBRATION</th></tr>
<tr><td>1006TG1A</td><td>TEKSAN</td><td>TJ101PR5A</td><td>50Hz</td><td>10 years</td><td>24/01/2011
27/04/2022</td></tr>
</table></td></tr>
<tr><td>Monitoring frequency</td><td>Fuel consumption is calculated using a working hour of genset and per hour consumption of diesel
Measuring frequency is done per monitoring period.</td></tr>
<tr><td>QA/QC procedures</td><td>Cross-check with operation hours of the emergency genset.</td></tr>
<tr><td>Purpose of data</td><td>Calculation of Project emissions</td></tr>
<tr><td>Additional comments</td><td>Fuel usage for auxiliary combustion only. Related project emissions are expected to remain below 0,1% of total emission reduction.</td></tr>
</table>

Relevant SDG Indicator/ Safeguarding Principle	13.3.1 Extent to which (i) global citizenship education and (ii) education for sustainable development are mainstreamed in (a) national education policies; (b) curricula; (c) teacher education; and (d) student assessment
Data / Parameter	w_{CH4}
Unit	m^3CH4/m^3LFG
Description	Methane fraction in the landfill gas
Source of data	PLC (gas analyzer)
Value(s) applied	For 2019: 55.43% For 2020: 55.53% For 2021: 53.96% Average for the Monitoring Period: 54.97%

<table>
<tr><td>Measurement methods and procedures</td><td>The gas analysing system is a modular construction and designed for stationary operation for measuring directly the fraction of methane in the landfill gas. The gas analyser provides three analogue signals, CH4, CO2 and O2. The values are measured continuously. The proportion of the data to be monitored is 100%.
<table>
<tr><th colspan="7">FIXED GAS FLOW AND PRESSURE MEASUREMENT EQUIPMENT IN BOOSTER</th></tr>
<tr><th></th><th>MODEL</th><th>MANUFACTURER</th><th>SERIAL NO.</th><th>ACCURACY</th><th>CALIBRATION FREQUENCY</th><th>DATE of CALIBRATION</th></tr>
<tr><td>Gas Analyser 1</td><td>SSM-6000-LT (2011)</td><td>PRONOVA</td><td>8002400-1598</td><td>2%-3% OF FULL SCALE (DEPENDING OF GAS CALIBRATION QUALITY)</td><td>10 years</td><td>01/08/2011

09/10/2020</td></tr>
<tr><td>Gas Analyser 2</td><td>SSM-6000-LT (2014)</td><td>PRONOVA</td><td>8002400-2428</td><td>2%-3% OF FULL SCALE (DEPENDING OF GAS CALIBRATION QUALITY)</td><td>10 years</td><td>22/07/2014</td></tr>
</table></td></tr>
<tr><td>Monitoring frequency</td><td>Continuously.</td></tr>
<tr><td>QA/QC procedures</td><td>The gas analyser is subject to a regular maintenance and testing regime to ensure accuracy. The gas analyser will be calibrated according to manufacturer’s specifications.
Accuracy +/- 0,065%</td></tr>
<tr><td>Purpose of data</td><td>Calculation of Project emission reduction</td></tr>
<tr><td>Additional comments</td><td>Methane fraction of the landfill gas and LFG flow has to be measured on the same basis (either wet or dry). Gas analysers provide values every 10 minutes so that the value given here (50.13%) is just an average value of the methane concentrations every 10 minutes. Please see Column F of Baseline Emissions Methane sheet and Column C of Emission Reductions sheet from ER workbook.</td></tr>
</table>

Relevant SDG Indicator/ Safeguarding Principle	13.3.1 Extent to which (i) global citizenship education and (ii) education for sustainable development are mainstreamed in (a) national education policies; (b) curricula; (c) teacher education; and (d) student assessment
Data / Parameter	T_{flare} /$T_{EG,m}$
Unit	°C
Description	Temperature in the exhaust gas of the enclosed flare in minute m
Source of data	PLC (Thermocouple)
Value(s) applied	500

<table>
<tr><td>Measurement methods and procedures</td><td>Thermocouple. Measure the temperature of the exhaust gas in the flare by an appropriate temperature measurement equipment. Measurements outside the operational temperature specified by the manufacturer may indicate that the flare is not functioning correctly and may require maintenance. Flare manufacturers must provide suitable monitoring ports for the monitoring of the temperature of the flare. These would normally be expected to be in the middle third of the flare. Where more than one temperature port is fitted to the flare, the flare manufacturer must provide written instructions detailing the conditions under which each location shall be used and the port most suitable for monitoring the operation of the flare according to manufacturer’s specifications for temperature
<table>
<tr><th colspan="7">FIXED GAS FLOW AND PRESSURE MEASUREMENT EQUIPMENT IN BOOSTER</th></tr>
<tr><th></th><th>Model</th><th>Manufacturer</th><th>Serial No.</th><th>Accuracy</th><th>Calibration Frequency</th><th>Date Of Calibration</th></tr>
<tr><td>Thermocouple</td><td>K TYPE</td><td>Isocontrolli</td><td>2012OF000652</td><td>Not Declared</td><td>1-2years</td><td>01/08/2011
10/05/2014</td></tr>
</table></td></tr>
<tr><td>Monitoring frequency</td><td>Once per minute</td></tr>
<tr><td>QA/QC procedures</td><td>Thermocouples are replaced and periodically calibrated according to the manufacturer’s recommendation</td></tr>
<tr><td>Purpose of data</td><td>Calculation of Project emission</td></tr>
<tr><td>Additional comments</td><td>The average exhaust gas temperature during the monitoring period is 500°C for the data that are used for calculations of emission reduction from flaring. Exhaust gas temperatures below and above the flare efficiency range are discarded from calculations. Unexpected changes such as a sudden increase/drop in temperature can occur for different reasons. These events are noted in the site records, and any corrective action is implemented to correct the issue. Monitoring of this parameter is applicable in the case of enclosed flares.</td></tr>
</table>

Relevant SDG Indicator/ Safeguarding Principle	7.2.1 “Renewable energy share in the total final energy consumption”
Data / Parameter	$EC_{BL,y}$
Unit	MWh
Description	Net electricity delivered to the grid
Source of data	The data from the Electricity Meters are the basis for the settlement notification of EPIAS. Data are gathered electronically from the meters by TEIAS and stored on the secured website of EPIAS, which is accessible to project developers with a private password. For monitoring, the monthly settlement notification of EPIAS shall be used as a source of data.
Value(s) applied	For the year 2019: 24,704.956 MWh For the year 2020: 34,245.758 MWh For the year 2021: 35,645.355 MWh Total for Monitoring Period: 94,596.069 MWh

<table>
<tr><td>Measurement methods and procedures</td><td>Electricity meters
<table>
<tr><th></th><th>Model</th><th>Serial Nr</th><th>Accuracy class</th><th>Calibration Frequency</th><th>Calibration date</th></tr>
<tr><td>Main Electricity Meter</td><td>Elster 1500</td><td>447413</td><td>IEC-EN 60687 0.5 class</td><td>10 years</td><td>06/12/2011</td></tr>
<tr><td>Back Up Electricity Meter</td><td>Elster 1500</td><td>447412</td><td>IEC-EN 60687 0.5 class</td><td>10 years</td><td>06/12/2011</td></tr>
<tr><td>Main Electricity Meter after 12/07/2019</td><td>LANDIS GYR ZG405C R-0601f</td><td>42595977</td><td>IEC-EN 60687 0.5 class</td><td>10 years</td><td>09/03/2018</td></tr>
<tr><td>Back Up Electricity Meter 12/07/2019</td><td>LANDIS GY ZG405C R-0601f</td><td>42595976</td><td>IEC-EN 60687 0.5 class</td><td>10 years</td><td>09/03/2018</td></tr>
</table></td></tr>
<tr><td>Monitoring frequency</td><td>Continuously</td></tr>
</table>

QA/QC procedures	According to the Article 2 of the 'Communiqué Regarding the Meters to be used in the Electricity Market '[6] (Communiqué): '*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 Science, Industry and Technology (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'[7] (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. Also according to Article 67 (page 20) of this regulation, the calibration shall be done in calibration stations which have been tested and approved by Ministry of Trade and Industry. Article 10-d) of Communiqué requires the meters shall be three phase four wire and Article 64 of Regulation clearly states how calibration shall be performed for this kind of meters. According to Article 3 of System Usage Agreement[8] done by Her Enerji and TEIAS; other than periodic tests, if a party alleges the meters are not working appropriately tests of the meters will be done by presence of both parties. If, after controls, it is seen that the meter is not working appropriately, the measurements of reserve meters are taken into account beginning from date both meters are reading the same (page 3, 2-c) 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.
Purpose of data	Calculation of Project emission reductions
Additional comments	-

[6] See, http://www.epdk.org.tr/english/regulations/electric/meters.doc, (page 6)
[7] See, http://www.sanayi.gov.tr/download/osgm/olcu_aletleri_muayene_yonetmelik.zip (page 2)
[8] See, http://www.teias.gov.tr/sistemkullanim1.doc , (page 3, 2-b)

Relevant SDG Indicator/ Safeguarding Principle	13.3.1 Extent to which (i) global citizenship education and (ii) education for sustainable development are mainstreamed in (a) national education policies; (b) curricula; (c) teacher education; and (d) student assessment
Data / Parameter	NCV i,y
Unit	TJ/Gg
Description	Net calorific value of diesel combusted for auxiliary purposes
Source of data	IPPC default value at the upper limit of the uncertainty at a 95 % confidence interval as provided in Table 1.2. of chapter 1 of Vol. 2 (Energy) of the 2006 IPCC Guidelines
Value(s) applied	43.3 (IPCC)
Measurement methods and procedures	Default value no measurement is conducted
Monitoring frequency	Once each verification, in case of applying IPCC values, any future revision of the IPPC guidelines is taken into account.
QA/QC procedures	N/A
Purpose of data/parameter	To calculate project emissions
Additional comments	-

Relevant SDG Indicator/ Safeguarding Principle	13.3.1 Extent to which (i) global citizenship education and (ii) education for sustainable development are mainstreamed in (a) national education policies; (b) curricula; (c) teacher education; and (d) student assessment
Data / Parameter	$EF_{CO2,i,y}$
Unit	t CO_2/GJ
Description	CO_2 emission factor of diesel in year y
Source of data	IPPC default value at the upper 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.
Value(s) applied	0.0748 t/GJ (IPCC)
Measurement methods and procedures	Default value no measurement is conducted
Monitoring frequency	Once each verification. In case of applying IPCC values, any future revision of the IPPC guidelines is taken into account
QA/QC procedures	N/A
Purpose of data/parameter	To calculate project emissions
Additional comments	-

Relevant SDG Indicator/ Safeguarding Principle	13.3.1 Extent to which (i) global citizenship education and (ii) education for sustainable development are mainstreamed in (a) national education policies; (b) curricula; (c) teacher education; and (d) student assessment
Data / Parameter	$Op_{j,h}$
Unit	h
Description	Operation of the equipment that consumes the LFG
Source of data	PLC of the system
Value(s) applied	59,802 hours

<table>
<tr><td>Measurement methods and procedures</td><td>The Project is considered to be operating when the total power generation of the engines is higher than 0 kW.
For each equipment unit j using the LFG monitor that the plant is operating in hour h by the monitoring any one or more of the following three parameters:
· Temperature. Determine the location for temperature measurements and minimum operational temperature based on the manufacturer´s specifications of the burning equipment. Document and justify the location and minimum threshold in the PDD; · Flame. The flame detection system is used to ensure that the equipment is in operation; · Products generated. Monitor the generation of steam for the case of boilers and air-heaters and glass for the case of glass melting furnaces. This option is not applicable to brick kilns. Opj,h = 0 when: · One of more temperature measurements is missing or below the minimum threshold in hour h (instantaneous measurements are made at least every minute); · Flame is not detected continuously in hour h (instantaneous measurements are made at least every minute); · No products are generated in the hour h Otherwise Opj,h = 1
<table>
<tr><td></td><td>Genset1 (hr)</td><td>Genset2 (hr)</td><td>Genset3 (hr)</td></tr>
<tr><td>01/01/2019</td><td>52,329</td><td>44,833</td><td>45,562</td></tr>
<tr><td>31/12/2019</td><td>55,513</td><td>53,198</td><td>53,121</td></tr>
<tr><td>31/12/2020</td><td>63,891</td><td>58,174</td><td>59,054</td></tr>
<tr><td>30/11/2021</td><td>71,514</td><td>64,228</td><td>66,784</td></tr>
<tr><td>Operation Hour</td><td>19,185</td><td>19,395</td><td>21,222</td></tr>
</table>
</td></tr>
<tr><td>Monitoring frequency</td><td>Measured continuously in real-time and recorded every 10 minutes.</td></tr>
<tr><td>QA/QC procedures</td><td>The PLC provides data on engines' supplied amount of power (kW). Operational hours are calculated based on engine operation (i.e. at least one of the engines generates power</td></tr>
<tr><td>Purpose of data</td><td>To calculate project emissions</td></tr>
<tr><td>Additional comments</td><td>This is monitored to ensure methane destruction is claimed for methane used in electricity plants when it is operational.</td></tr>
</table>

Relevant SDG Indicator/ Safeguarding Principle	13.3.1 Extent to which (i) global citizenship education and (ii) education for sustainable development are mainstreamed in (a) national education policies; (b) curricula; (c) teacher education; and (d) student assessment
Data / parameter:	Air quality (emissions other than GHGs)
Unit	tons/GWh
Description	Amount of CO, NMVOC emissions
Source of data	Monthly meter readings
Value(s) applied	**CO:** For 2019: 2.54 tCO_2e/yr For 2020: 3.50 tCO_2e/yr For 2021: 3.20 tCO_2e/yr TOTAL: 9.24 tCO_2e/MP **NMVOC:** For 2019: 0.24 tCO_2e/yr For 2020: 0.34 tCO_2e/yr For 2021: 0.31 tCO_2e/yr TOTAL: 0.89 tCO_2e/MP
Measurement methods and procedures	Amount of annual net electricity generation, which is calculated by monthly settlement notifications of EPİAŞ based on monthly meter readings, will be used to calculate estimated CO and NMVOC emission reductions by project activity.
Monitoring frequency	Annually
QA/QC procedures	Amount of annual net electricity generation, which is calculated by monthly settlement notifications of EPİAŞ based on monthly meter

	readings, will be used to calculate estimated CO and NMVOC emission reductions by project activity.
Purpose of data	To account for Emissions Reductions of CO, NMVOC.
Additional comments	-

Relevant SDG Indicator/ Safeguarding Principle	7.2.1 “Renewable energy share in the total final energy consumption”
Data / Parameter	$EC_{PJ,y}$
Unit	MWh/yr
Description	Quantity of electricity consumed by the project electricity consumption source j in year y
Source of data	The data from the Electricity Meters are the basis for the settlement notification of EPIAS. Data are gathered electronically from the meters by TEIAS and stored in secured website of EPIAS, which is accessible to project developer with a private password. For monitoring, the monthly settlement notification of EPIAS shall be used as source of data.
Value(s) applied	For year 2019: 0.166 MWh For year 2020: 0.197 MWh For year 2021: 0.311 MWh Total for Monitoring Period: 0.674 MWh

<table>
<tr><td>Measurement methods and procedures</td><td>• Regarding the electricity meters: two meters will be placed (one main and one reserve). at the TEIAS substation. These meters are sealed by TEIAS and intervention by project proponent is not possible. The fact that two meters are installed in a redundant manner keeps the uncertainty level of the only parameter for baseline calculation low. High data quality of this parameter is not only in the interest of the emission reduction monitoring, but paramount for the business relation between the plant operator and the electricity buyer.
• Measured hourly and readings monthly: Monthly settlement notifications of EPIAS consist hourly electricity production and withdrawn from the grid
• Since the meters are reading electricity supplied to the system and withdrawn from the system separately, the net electricity amount supplied to the grid will be calculated by electricity supplied minus electricity withdrawn which will be taken from monthly settlement notifications. Thus with this procedure is monitored sufficient and no extra Monitoring has to be implemented. The above described measurement method follows Article 81 of the official regulation “Electricity Market Balancing And Settlement Regulation”
<table>
<tr><th></th><th>Model</th><th>Serial Nr</th><th>Accuracy class</th><th>Calibration Frequency</th><th>Calibration date</th></tr>
<tr><td>Main Electricity Meter</td><td>Elster 1500</td><td>447413</td><td>IEC-EN 60687 0.5 class</td><td>10 years</td><td>06/12/2011</td></tr>
<tr><td>Back Up Electricity Meter</td><td>Elster 1500</td><td>447412</td><td>IEC-EN 60687 0.5 class</td><td>10 years</td><td>06/12/2011</td></tr>
<tr><td>Main Electricity Meter after 12/07/2019</td><td>LANDIS GYR ZG405C R-0601f</td><td>42595977</td><td>IEC-EN 60687 0.5 class</td><td>10 years</td><td>09/03/2018</td></tr>
<tr><td>Back Up Electricity Meter 12/07/2019</td><td>LANDIS GY ZG405C R-0601f</td><td>42595976</td><td>IEC-EN 60687 0.5 class</td><td>10 years</td><td>09/03/2018</td></tr>
</table>
</td></tr>
<tr><td>Monitoring frequency</td><td>Continuously</td></tr>
</table>

QA/QC procedures	According to the Article 2 of the 'Communiqué Regarding the Meters to be used in the Electricity Market': '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 Science, Industry and Technology (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. Also according to Article 67 (page 20) of this regulation, the calibration shall be done in calibration stations which have been tested and approved by Ministry of Trade and Industry. Article 10-d) of Communiqué requires the meters shall be three phase four wire and Article 64 of Regulation clearly states how calibration shall be performed for this kind of meters. According to Article 3 of System Usage Agreement done by Her Enerji and TEIAS; other than periodic tests, if a party alleges the meters are not working appropriately tests of the meters will be done by presence of both parties. If, after controls, it is seen that the meter is not working appropriately, the measurements of reserve meters are taken into account beginning from date both meters are reading the same (page 3, 2-c) 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.
Purpose of data	Calculation of the baseline emissions
Additional comments	-

Relevant SDG Indicator/ Safeguarding Principle	8.8.2 "Level of national compliance with labour rights (freedom of association and collective bargaining) based on International Labour Organization (ILO) textual sources and national legislation, by sex and migrant status"
Data / parameter:	Quantitative employment and income generation
Unit	Number of employment
Description	The employment data has been monitored to indicate the contribution to the SDG 8
Source of data	Social security records
Value(s) applied	

Employee	Local or Not
Ahmet Can Sadık	Local
Ali İçer	Local
Arif Civelek	Not Local
Cengiz Ceylan	Not Local
Duran Arman Sarıtaş	Local
İbrahim Yaman	Local
Mehmet Ors	Local
Muhammed Sait Aktaş	Local
Musa Çelik	Not Local
Nahit Akçakaya	Local
Ömer Günaydın	Local
Yahya Yıldız	Not Local
Yasin Ayyıldız	Not Local

Measurement methods and procedures	N/A
Monitoring frequency	Each verification period

QA/QC procedures	-
Purpose of data	To exhibit employment performance of the plant
Additional comments	-

Relevant SDG Indicator/ Safeguarding Principle	8.8.2 “Level of national compliance with labour rights (freedom of association and collective bargaining) based on International Labour Organization (ILO) textual sources and national legislation, by sex and migrant status”
Data / parameter:	Quality of employment
Unit	Number trainings given to employees
Description	The trainings’ data has been monitored to indicate the contribution to the SDG 8
Source of data	Training of certificates provided by the Project Proponent
Value(s) applied	

Employee	2019	2020	2021
Mehmet Ors	05/02/2019 17/09/2019	10/03/2020 14/11/2020	20/02/2021 27/08/2021
Yahya Yıldız	05/02/2019 17/09/2019	10/03/2020 14/11/2020	20/02/2021 27/08/2021
Ömer Günaydın	05/02/2019 17/09/2019	10/03/2020 14/11/2020	20/02/2021 27/08/2021
Nahit Akçakaya	05/02/2019 17/09/2019	10/03/2020 14/11/2020	20/02/2021 27/08/2021
Musa Çelik	05/02/2019 17/09/2019	10/03/2020 14/11/2020	20/02/2021 27/08/2021
Cengiz Ceylan	05/02/2019 17/09/2019	10/03/2020 14/11/2020	20/02/2021 27/08/2021
Ibrahim Yaman	05/02/2019 17/09/2019	10/03/2020 14/11/2020	20/02/2021 27/08/2021
Yasin Ayyıldız	05/02/2019 17/09/2019	10/03/2020 14/11/2020	20/02/2021 27/08/2021
Arif Civelek	05/02/2019 17/09/2019	10/03/2020 14/11/2020	20/02/2021 27/08/2021
Duran Arman Sarıtaş	05/02/2019 17/09/2019	10/03/2020 14/11/2020	20/02/2021 27/08/2021
Ahmet Can Sadık	Not employed	10/09/2020 11/09/2020	09/08/2021 10/08/2021
Ali İçer	04/01/2019 05/01/2019	03/01/2020 04/01/2020	04/01/2021 05/01/2021
Muammet Sait Aktas	10/08/2019 11/08/2019	10/08/2020 11/08/2020	09/08/2021 10/08/2021

Measurement methods and procedures	N/A
Monitoring frequency	Each verification period
QA/QC procedures	-
Purpose of data	To exhibit employees’ training performance
Additional comments	-

Relevant SDG Indicator/ Safeguarding Principle	Principle 9.4 Release of pollutants
Data / parameter:	Disposal of leachate
Unit	-
Description	Proper disposal of leachate generated in the landfill
Source of data	Project Proponent
Value(s) applied	A statement from the Kayseri Municipality regarding leachate disposal is provided
Measurement methods and procedures	Leachate generated will be treated in the treatment plant of the Kayseri Municipality. A statement from the Kayseri Municipality regarding leachate disposal is provided. Receipts or a signed statement by the Municipality will be obtained by the Project Proponent showing the proper leachate transfer to the treatment plant.
Monitoring frequency	Once each verification
QA/QC procedures	N/A
Purpose of data	To demonstrate that the Project does not impact nearby soil conditions, leachate will be safely collected and transferred to the Kayseri Metropolitan Municipality treatment plant
Additional comments	

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

Data/Parameter	Value obtained in this monitoring period	Value obtained last monitoring period
SDG 13	CO_2e Emission Reductions 429,098 tCO_2/MP	CO_2e Emission Reduction: 493,769 tCO_2
SDG 13 (Air Quality – emissions other than GHGs)	9.24 tCO reduction/MP 0.89 tNMVOC reduction/MP	14.6 tCO reduction/MP 3.1 tNMVOC reduction/MP
SDG 7	Quantity of net electricity supplied to the grid in MP 94,596.069 MWh electricity generated during monitoring period	100,551.150 MWh electricity generated during last monitoring period
SDG 8	Quantitative Employment: Number of employment 13 employees have been working at the plant	Quantitative Employment: Number of employment 17 employees was working at the plant.
SDG 8	Quantitative Employment:	Quantitative Employment:

	Health and Safety Training was held for all of the employees	Health and Safety Training was held for all of the employees
Other pollutants	Leachate generated at the landfill is collected at the bottom of the landfill site, and transferred to the Kayseri Metropolitan Municipality treatment plant. Leachate generated is being treated in the treatment plant of the Kayseri Municipality. A statement from the Kayseri Municipality regarding leachate disposal is provided.	Leachate generated at the landfill is collected at the bottom of the landfill site, and transferred to the Kayseri Metropolitan Municipality treatment plant. Leachate generated is being treated in the treatment plant of the Kayseri Municipality. A statement from the Kayseri Municipality regarding leachate disposal is provided.

D.4. Implementation of sampling plan

N/A

SECTION E. CALCULATION OF SDG IMPACTS

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

FOR SDG-13

Baseline emissions are calculated as per the consolidated Methodology ACM0001 version 13 and determined according to equation 1 and comprise the following sources:

(A) Methane emissions from the SWDS in the absence of the project activity;
(B) Electricity generation using fossil fuels or supplied by the grid in the absence of the project activity;

$$BE_y = BE_{CH4,y} + BE_{EC,y} \quad \textbf{(1)}$$

where

BE_y Baseline emissions in year y (t CO_2e)
$BE_{CH4,y}$ Baseline emissions of methane from the SWDS in year *y* (t CO_2e/yr)
$BE_{EC,y}$ Baseline emissions associated with electricity generation in year *y* (t CO_2e/yr)

For example, for the year 2019, from the ER Excel spreadsheet Emission Reductions section, we can see that $BE_{CH4,2019}$ = 113,149 t CO_2e and $BE_{EC,2019}$ = 13,125 t CO_2e;

For the year 2020, from the ER Excel spreadsheet Emission Reductions section, we can see that $BE_{CH4,2020}$ = 124,337 t CO_{2e} and $BE_{EC,2020}$ = 18,194 tCO_{2e};

For the year 2021, from the ER Excel spreadsheet Emission Reductions section, we can see that $BE_{CH4,2021}$ = 141,739 tCO_2e and $BE_{EC,2021}$ = 18,938 tCO_2e;

Electricity Production Component:

The total emission reductions from electricity production can be calculated with the results of the below-described equations. The emission reduction equals the baseline emissions minus project and leakage emissions. Leakage emissions in this project are considered to be negligible. The general equation is as follows:

$$ER_y = BE_y - PE_y - L_y \quad (2)$$

Where:

ER_y	Emission reduction
$BE_{EC,y}$	Baseline emissions
PE_y	Project emissions
L_y	Leakage
y	Refers to a given period

According to the methodological tool "Tool to calculate baseline, project and/or leakage emissions from electricity consumption" (Version 01), baseline emission for electricity generation is calculated by multiplying the amount of electricity generated using LFG with the carbon emission factor of the electricity source, which is the Turkish national grid.

Option A1 of the tool is applied; thus Methodological tool: "Combined tool to identify the baseline scenario and demonstrate additionality" (Version 05.0.0), was used to calculate the emission factor. Thus, $EF_{EL,k,,y}$,is equal to $EF_{grid,CM,y}$. Due to the fact that EPIAS publishes the electricity generation and consumption data taking into account the transmission distribution losses (i.e. Kayipli Veris & Kayipli Cekis), the calculations carried out in the ER excel already account for the losses. For simplicity $TDL_{k,y}$ is assumed to be equal to zero.

$$BE_{EC,y} = \sum_k EC_{BL,k,y} x EF_{EL,k,y} x \left(1 + TDL_{k,y}\right) \quad (3)$$

Where:

$BE_{EC,y}$	Baseline emissions for electricity generation in year y (tCO2/yr)
$EC_{BL,k,y}$	Quantity of electricity that would be generated using LFG in year y (MWh/yr)
$FE_{EL,k,,y}$ (tCO2/MWh)	Emission factor for electricity generation for source k in year y
$TDL_{k,y}$	Average technical transmission and distribution losses for providing electricity to source k in year y

k Sources of electricity consumption in the baseline

Emission factor for electricity generation for source k in year y (tCO2/MWh)	**0.5313**

Table 6: Baseline emissions for electricity generation sample calculation table

		Quantity of electricity that is generated using LFG in year y	Electricity Consumption by project Activity	NET Quantity of electricity that is generated using LFG in year y	Baseline emissions for electricity generation in year y
		MWh	MWh	MWh	(tCO2/yr)
11.04.2019	30.04.2019	1,844.440	0.010	1,844.430	979.946
2019_05		2,878.580	0.020	2,878.560	1,529.379
2019_06		2,796.170	0.020	2,796.150	1,485.594
2019_07		2,800.984	0.053	2,800.931	1,488.135
2019_08		2,994.998	0.000	2,994.998	1,591.242
2019_09		2,761.882	0.010	2,761.872	1,467.383
2019_10		2,897.849	0.000	2,897.849	1,539.627
2019_11		2,789.246	0.000	2,789.246	1,481.926
2019_12		2,940.973	0.053	2,940.920	1,562.511
2019		**24,705.122**	**0.166**	**24,704.956**	**13,125.000**
2020_01		2,868.990	0.000	2,868.990	1,524.294
2020_02		2,722.767	0.000	2,722.767	1,446.606
2020_03		2,968.297	0.010	2,968.287	1,577.051
2020_04		2,887.266	0.030	2,887.236	1,533.988
2020_05		2,868.357	0.040	2,868.317	1,523.937
2020_06		2,635.905	0.020	2,635.885	1,400.446
2020_07		2,863.100	0.059	2,863.041	1,521.134
2020_08		2,759.615	0.000	2,759.615	1,466.183
2020_09		2,778.357	0.028	2,778.329	1,476.126
2020_10		2,891.322	0.010	2,891.312	1,536.154
2020_11		2,924.397	0.000	2,924.397	1,553.732
2020_12		3,077.582	0.000	3,077.582	1,635.119
2020		**34,245.955**	**0.197**	**34,245.758**	**18,194.000**
2021_01		2,960.298	0.000	2,960.298	1,572.806
2021_02		2,838.572	0.028	2,838.544	1,508.118

	Quantity of electricity that is generated using LFG in year y	Electricity Consumption by project Activity	NET Quantity of electricity that is generated using LFG in year y	Baseline emissions for electricity generation in year y
2021_03	3,283.894	0.028	3,283.866	1,744.718
2021_04	3,283.280	0.047	3,283.233	1,744.382
2021_05	3,317.593	0.057	3,317.536	1,762.607
2021_06	3,236.738	0.010	3,236.728	1,719.674
2021_07	3,286.370	0.019	3,286.351	1,746.038
2021_08	3,350.375	0.047	3,350.328	1,780.029
2021_09	3,259.749	0.019	3,259.730	1,731.895
2021_10	3,468.925	0.028	3,468.897	1,843.025
2021_11	3,359.872	0.028	3,359.844	1,785.085
2021	**35,645.666**	**0.311**	**35,645.355**	**18,938.000**
Total	**94,596.743**	**0.674**	**94,596.069**	**50,257.000**

Methane Destruction Component:

Baseline methane emissions from the SWDS are determined as follows, based on the amount of methane captured under the project activity and the amount that would be captured and destroyed in the baseline (such as due to regulations). In addition, the effect of methane oxidation that is present in the baseline and absent in the project is taken into account:

$$BE_{CH4,y} = (1 - OX_{top-layer})(F_{CH4,PJ,y} - F_{CH4,BL,y})GWP_{CH4} \quad \textbf{(4)}$$

Where:

$BE_{CH4,y}$ Baseline emissions of LFG from the SWDS in year *y* (t CO2e/yr)

$OX_{top-layer}$ Fraction of methane in the LFG that would be oxidized in the top layer of the SWDS in the baseline (dimensionless)

$F_{CH4,PJ,Y}$ Amount of methane in the LFG which is flared and/or used in the project activity in year *y* (t CH4/yr)

$F_{CH4,BL,y}$ Amount of methane in the LFG that would be flared in the baseline in year *y* (t CH4/yr) *(it is assumed to be zero)*

GWP_{CH4} Global warming potential of CH4 (t CO2e/t CH4)

For example, for the year 2019, as we can see from the ER Excel spreadsheet;

$BE_{CH4,2019}$ = (1 – 0.1)*(5,028.87 – 0)*25= 113,149 tCO_2e

For the year 2020, as we can see from the ER Excel spreadsheet;

$BE_{CH4,\ 2020}$ = (1 – 0.1)*(5,526.10 – 0)*25 = 124,337 tCO_2e

For the year 2021, as we can see from the ER Excel spreadsheet;

$BE_{CH4,\ 2021}$ = (1 – 0.1)*(5,624.60 – 0)*28 = 141,739 tCO_2e

During the crediting period, $\mathbf{F_{CH4,\ PJ,y}}$ is determined as the sum of the quantities of methane flared and used in power plant(s), boiler(s), air heater(s), kiln(s) and natural gas distribution network, as follows based on the UNFCCC Methodology ACM0001 Version 13: ' Flaring or use of landfill gas[9]:

$$F_{CH4,PJ,y} = F_{CH4\,flared,y} + F_{CH4,EL,y} + F_{CH4,HG,y} + F_{CH4,NG,y} \quad \textbf{(5)}$$

Where:

$F_{CH4,PJ,y}$: Amount of methane in the LFG which is flared and/or used in the project activity in year *y* (t CH4/yr)

$F_{CH4,flared,y}$: Amount of methane in the LFG which is destroyed by flaring in year *y* (tCH4/yr)

$F_{CH4,EL,y}$: Amount of methane in the LFG which is used for electricity generation in year *y* (t CH4/yr)

$F_{CH4,HG,y}$: Amount of methane in the LFG which is used for heat generation in year *y* (t CH4/yr)

$F_{CH4,NG,y}$: Amount of methane in the LFG which is sent to the natural gas distribution network in year *y* (t CH4/yr)

[9] https://cdm.unfccc.int/filestorage/E/Y/F/EYFHCV3K4J5P06DTQSG9WLMOBNUX2I/EB67_repan12_ACM0001_ver13.0.0.pdf?t=d1N8bml5NXBufDBcqEutRdBgweII-mXeF-YD

The amount of methane that is destroyed/ combusted in the project scenario during year y is determined by monitoring the quantity of methane actually flared and by monitoring the gas used to generate electricity and the total quantity of methane captured. There is neither methane used to generate thermal energy (HG) nor sent to the pipeline for feeding to the natural gas (NG) distribution network or flared.

Thus, $F_{CH4,\ PJ,\ y}$ will be calculated as follow. The calculation is done in the excel sheet 'emission reduction' column F:

$$F_{CH4,PJ,y} = F_{CH4\,flared,y} + F_{CH4,EL,y} \quad \textbf{(6)}$$

While flare efficiency could not be confirmed for each minute, the efficiency was added as "zero" to the calculation. As per Tool 06 Project Emissions from Flaring Version 03.0 Paragraph 22, taking efficiency as zero for enclosed flares is possible and conservative. Due to the fact that flare efficiency is assumed to be zero $F_{CH4,flared,y}$ becomes zero also. And $F_{CH4,EL,y}$ becomes equal to $F_{CH4,PJ,y}$.

For the year 2019, as we can see from the ER Excel spreadsheet; $F_{CH4,\ PJ,\ 2019}$ =5,028.87; $F_{CH4,\ EL,\ 2019}$ = 5,028.87 *tCH₄ and* $F_{CH4,\ flared,\ 2019}$ = 0 *for the year of 2019.*

For year 2020; $F_{CH4,\ PJ,\ 2020}$ =5,526.10; $F_{CH4,\ EL,\ 2020}$ = 5,526.10 tCH_4 and $F_{CH4,\ flared,\ 2020}$ = 0 for the year of 2020.

For year 2021; $F_{CH4,\ PJ,\ 2021}$ =5,624.60; $F_{CH4,\ EL,\ 2021}$ = 5,624.60 tCH_4 and $F_{CH4,\ flared,\ 2021}$ = 0 for the year of 2021.

Air Quality (emissions other than GHGs)

There would be a potential fossil fuel consumption activity if this WPP were not implemented. In this electricity generation scenario, there would be emissions of CO and NMVOC. The baseline value for potential emissions of CO and NMVOC due to fossil fuel-fired energy generation is calculated as follows:

First, emissions per GWh of fossil fuel-fired electricity are required to calculate how many tons of emissions would have been caused by such a fossil fuel-fired electricity generation. These default values have been calculated in the registration period as:

- 0.098 tons/GWh for CO
- 0.009 tons/GWh for NMVOC

Then, the emissions of these compounds are calculated as follows:

Emission Amount by Project Activity (tons) = Electricity Generation of Project Activity x Emission per GWh (tons/GWh)

This yields:

- 9.24 tons/MP for CO
- 0.89 tons/MP for NMVOC

FOR SDG 7

There is no electricity generation in the baseline scenario in which Kayseri Molu LFG is not being implemented.

The project's contribution to SDG 7 is determined via a simple calculation that provides the overall renewable energy generation fed into the grid. This approach is based on the following calculation:

The quantity of net electricity generation supplied by the project plant to the grid in the related year has been calculated by subtracting the value of "Electricity consumption from the grid (MWh)" from "Electricity supplied to the grid (MWh)"

Calculation of Electricity Generation of Kayseri Molu LFG:
Net Electricity Generation of Kayseri Molu LFG= Electricity supplied to the grid (MWh) - Electricity consumption from the grid (MWh)

FOR SDG 8

If this power plant had not been installed, there would be no employment in the project area or around the project. So, employment opportunities are provided with this project.

Without this project, there would be no employment and no training. Therefore, it would not be possible to contribute to education. It is aimed to provide training to both local employees and all workers working in the plant. The objective is to be achieved by ensuring that everyone is trained in the plant. Health and safety (HSE) training certificates for all employees are verified, and also, all employees are to be trained according to the requirements.

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

FOR SDG 13

While flare efficiency could not be confirmed for each minute, the efficiency was added as "zero" to the calculation. Due to the fact that flare efficiency is assumed to be zero, $F_{CH4,flared,y}$ becomes zero also. And thus, all LFG that is sent to the flare unit ends up as project emissions.

$PE_{flare,}$ = (25 tCO_2/tCH_4 * 6,043.133 + 28 $tCO2/tCH_4$ * 8,834.372) (Baseline Emissions Methane tab column G) kg CH_4/hr * (1-0) * 10^{-3} $tCH4/kgCH_4$ = 382 tCO2e

Amount of methane destroyed by electricity production (F_CH4, electricity, y)

$$F_{CH4,EL,y} = LFG_{electricity,y} * w_{CH4} * D_{CH4} \quad \textbf{(10)}$$

The LFG consumption in the flare and gen-sets throughout the monitoring period was obtained from measurement devices for verification purposes.

$F_{\_CH4\_EL}$ can be read as 16,179.572 tons from Column H of the Baseline Emissions Methane tab of ER Excel workbook during the Monitoring Period.

Project emissions from consumption of fossil fuels due to project activity

$$PE_y = PE_{EC,y} + PE_{FC,y} \quad \textbf{(12)}$$

Where:

PE_y	Project emissions in year *y* (t CO2/yr)
$PE_{EC,y}$	Emissions from consumption of electricity due to the project activity in year *y* (t CO2/yr)

$PE_{FC,y}$ Emissions from consumption of fossil fuels due to the project activity, for a purpose other than electricity generation, in year *y* (t CO2/yr)

There are no project emissions from electricity consumption while the electricity consumed is already subtracted from gross electricity generation. Project emission is caused by the consumption of fossil fuels by the Project activity. Using the "Tool to calculate project or leakage CO emissions from fossil fuel combustion is calculated."

$$PE_{FC,y} = \sum_{k} FC_{i,j,y} \; xCOEF_{j,y} \qquad \textbf{(13)}$$

Where:

$PE_{EC,y}$ Project emissions for electricity consumption in year y (tCO2/yr)

$FC_{i,j,,y}$ Quantity of fuel type i combusted in process j in the year y,

$COEF_{j,y}$ emission coefficient of fuel type i in the year y (t CO2)

The CO_2 emission coefficient is calculated following Option B based on the net calorific value and CO_2 emission factor of the fuel type I as follows:

$$COEF_{i,y} = NCV_{i,y} \times EF_{CO2,i,y} \qquad \textbf{(14)}$$

Where;

$COEF_{i,y}$ CO_2 emission coefficient of fuel type i in year y

$NCV_{i,y}$ the weighted average net calorific value of the fuel type I in year y

$EF_{CO2,y}$ the weighted average CO_2 emission factor of fuel type I in year y

i are the fuel types combusted in process j during the year y

Total Fuel Consumption in Liters	January	February	March	April	May	June	July	August	September	October	November	December	TOTAL
2019 - Total Diesel Consumption (lt)	0,0000	0,0000	0,0000	0,0000	0,0000	0,0000	0,0000	0,0000	0,0000	0,0000	0,0000	0,0000	0,0000
2020 - Total Diesel Consumption (lt)	0,0000	0,0000	0,0000	0,0000	0,0000	0,0000	0,0000	0,0000	71,0000	118,0000	0,0000	0,0000	189,0000
2021 - Total Diesel Consumption (lt)	0,0000	0,0000	0,0000	0,0000	0,0000	0,0000	0,0000	0,0000	0,0000	0,0000	146,0000	0,0000	146,0000
												TOPLAM =	335,0000

Total Fuel Consumption in tonnes	January	February	March	April	May	June	July	August	September	October	November	December	TOTAL
2019 - Total Diesel Consumption (tons)	0,0000	0,0000	0,0000	0,0000	0,0000	0,0000	0,0000	0,0000	0,0000	0,0000	0,0000	0,0000	0,0000
2020 - Total Diesel Consumption (tons)	0,0000	0,0000	0,0000	0,0000	0,0000	0,0000	0,0000	0,0000	0,0591	0,0982	0,0000	0,0000	0,1572
2021 - Total Diesel Consumption (tons)	0,0000	0,0000	0,0000	0,0000	0,0000	0,0000	0,0000	0,0000	0,0000	0,0000	0,1215	0,0000	0,1215
												TOPLAM =	0,2787

Project Emissions	January	February	March	April	May	June	July	August	September	October	November	December	TOTAL
2019 - Project Emissions	0,0000	0,0000	0,0000	0,0000	0,0000	0,0000	0,0000	0,0000	0,0000	0,0000	0,0000	0,0000	0
2020 - Project Emissions	0,0000	0,0000	0,0000	0,0000	0,0000	0,0000	0,0000	0,0000	0,1913	0,3180	0,0000	0,0000	1
2021 - Project Emissions	0,0000	0,0000	0,0000	0,0000	0,0000	0,0000	0,0000	0,0000	0,0000	0,0000	0,3934	0,0000	1
												TOPLAM =	2

In the following table, it is possible to see the monthly used diesel for project activity purposes. These values in litres are directly retrieved from the project engineer.
Total Diesel consumption = 335 liters
Total consumed fuel in tonnes = 0.2787 tons
Emission factor (kg/Tj) = 0.0748 tCO2/Gj and NCV (Gj/Tt) = 43.3 Tj/Gg
COEF = 3.2388 and finally PE = 3.2388 *0.2787 = 0.9027 tCO2/yr

CO2e Emissions
The proposed project activity involves the generation of electricity by development of a landfill gas to electricity plant. The generation of electricity does not result in greenhouse gas emissions and therefore is taken as 0 tCO2/year.

Air Quality - Emissions other than GHGs
There is no CO, NMVOC and NOx emissions due to the project activity.

FOR SDG 8
The employment of local people with the necessary technical qualifications for the required post has been the priority and enhanced by all project activities during the construction and operation of landfill gas to energy plant. As a result, increased job opportunities and project business activities have partially eliminated local poverty and unemployment. Moreover, as a contribution of the project to the welfare of the region, the quality of the electricity consumed in the region has been increased by local electricity production, which also contributes to decreasing distribution losses.

In this monitoring period, 13 workers have been employed. 8 of them were locally performed. Also, HSE training has been given to all employees at the plant.

Employee	Local or Not
Ahmet Can Sadık	Local
Ali Içer	Local
Arif Civelek	Not Local
Cengiz Ceylan	Not Local
Duran Arman Sarıtaş	Local
Ibrahim Yaman	Local
Mehmet Örs	Local
Muhammed Sait Aktaş	Local

Musa Çelik	Not Local
Nahit Akçakaya	Local
Ömer Günaydın	Local
Yahya Yıldız	Not Local
Yasin Ayyıldız	Not Local

HSE Trainings given for the years 2019, 2020 and 2021 are provided below.

Employee	2019	2020	2021
Mehmet Örs	05/02/2019 17/09/2019	10/03/2020 14/11/2020	20/02/2021 27/08/2021
Yahya Yıldız	05/02/2019 17/09/2019	10/03/2020 14/11/2020	20/02/2021 27/08/2021
Ömer Günaydın	05/02/2019 17/09/2019	10/03/2020 14/11/2020	20/02/2021 27/08/2021
Nahit Akçakaya	05/02/2019 17/09/2019	10/03/2020 14/11/2020	20/02/2021 27/08/2021
Musa Çelik	05/02/2019 17/09/2019	10/03/2020 14/11/2020	20/02/2021 27/08/2021
Cengiz Ceylan	05/02/2019 17/09/2019	10/03/2020 14/11/2020	20/02/2021 27/08/2021
Ibrahim Yaman	05/02/2019 17/09/2019	10/03/2020 14/11/2020	20/02/2021 27/08/2021
Yasin Ayyıldız	05/02/2019 17/09/2019	10/03/2020 14/11/2020	20/02/2021 27/08/2021
Arif Civelek	05/02/2019 17/09/2019	10/03/2020 14/11/2020	20/02/2021 27/08/2021
Duran Arman Sarıtaş	05/02/2019 17/09/2019	10/03/2020 14/11/2020	20/02/2021 27/08/2021
Ahmet Can Sadık	Not employed	10/09/2020 11/09/2020	09/08/2021 10/08/2021
Ali İçer	04/01/2019 05/01/2019	03/01/2020 04/01/2020	04/01/2021 05/01/2021
Muammet Sait Aktas	10/08/2019 11/08/2019	10/08/2020 11/08/2020	09/08/2021 10/08/2021

FOR SDG 7

Firstly, the project has helped accelerate the growth of the landfill gas power industry and stimulated the designation and production of renewable energy technologies in Turkey. Then, other entrepreneurs, irrespective of the sector, have been encouraged to invest in landfill gas power generations. It has also assisted in reducing Turkey's increasing energy deficit and diversifying the electricity generation mix while reducing import dependency, especially natural gas. Importantly, rural development has been maintained in the areas around the project site by providing infrastructural investments to these remote villages.

Implementation of the proposed project has contributed to the broader deployment of landfill gas power technology at local and national levels. It has demonstrated the viability of larger grid-connected landfill gas power plants, supporting improved energy security, alternative sustainable energy, and renewable energy industry development. This will also strengthen the pillars of the Turkish electricity supply based on ecologically sound technology.

The project's contribution to SDG 7 is determined via a simple calculation that provides the overall renewable energy generation fed into the grid. This approach is based on the following calculation:

The quantity of net electricity generation supplied by the project plant to the grid in the related year has been calculated by subtracting the value of "Electricity consumption from the grid (MWh)" from "Electricity supplied to the grid (MWh)"

For Kayseri Molu LFG: This yields as 94,596.069 MWh/MP

E.3. Calculation of leakage

No leakage needs to be considered.

Gold Standard for the Global Goals

TEMPLATE

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

SDG	SDG Impact	Baseline estimate	Project estimate	Net benefit
13	CO_2 Emission Reduction & Air Quality – Emissions other than GHGs	429,098 tCO_2/MP CO: 9.24 tons/MP NMVOC: 0.89 tons/MP	0 tCO_2 CO: 0 ton/ MP NMVOC: 0 ton/ MP	429,098 tCO_2/MP CO: 9.24 tons/MP NMVOC: 0.89 tons/MP
8	Quantitative Employment And Income Generation	Quantitative Employment: No employment. Qualitative Employment: No training	Quantitative Employment: 13 employees work at the plant. There are 8 local employees. Current employment records are now presented. Qualitative Employment:	Quantitative Employment: 13 employees work at the plant. There are 8 local employees. Current employment records are now presented. Qualitative Employment:

	& Qualitative Employment		All the workers that Her Enerji Üretim A.Ş employs have taken a series of training courses. Occupational Health and Safety (HSE) training was provided in 2021, and 13 employees attended the training. Training records for the employees are provided, such as occupational health and safety training.	All the workers that Her Enerji Üretim A.Ş employs have taken a series of training courses. Occupational Health and Safety (HSE) training was provided in 2019, 2020, and 2021 and 13 employees attended the training. Employees' training records are provided, such as occupational health and safety training.
7	Electricity Generation	Energy is generated by using renewable energy systems throughout the project. There is no electricity generation in the baseline scenario in which Kayseri Molu LFG is not being implemented.	Energy (94,596.069 MWh) is generated by using renewable energy systems throughout the project for the MP.	Energy (94,596.069 MWh) is generated by using renewable energy systems throughout the project

TEMPLATE

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

SDG	Values estimated in ex ante calculation of approved PDD for this monitoring period	Actual values achieved during this monitoring period
13	Emission Reduction: 137,502 tCO_2 (for this MP) Air Quality: CO: 0.35 tons/MP NMVOC: 0.09 tons/MP	Emission Reduction: 429,098 tCO_2 (for this MP) Air Quality: CO: 9.24 tons/MP NMVOC: 0.89 tons/MP
8	Quality of Employment: A set of training (eg. Health and safety training) are foreseen to be given to all employees at the plant. Quantitative Employment and Income Generation: Employee numbers are foreseen to be monitored.	Quality of Employment: Training certificates are provided. Quantitative Employment and Income Generation: Current employment records are presented. 13 employees work at the plant. (8 of them are local)
7	Energy is generated by using renewable energy systems throughout the project. This generation amount was calculated as 65,782 MWh.	Energy (94,596.069 MWh) is generated by using renewable energy systems throughout the project (Wind Power Plant).

E.5.1. Explanation of calculation of value estimated ex-ante calculation of approved PDD for this monitoring period

Estimated emission reduction in ex ante calculation of registered PDD Version 8 is 54,292 tCO2e for 2019, 52,175 tCO2e for 2020 and 50,171 tCO2e for 2021. If the 2019 ER estimate is to be apportioned (265 days) along with the emissions of 2020 and 2021, the value comes out to be 54,292*(265/365) + 52,175 + 50,071*(334/365) = 137,502 tCO2e and actual emission reduction achieved during this monitoring period is 429,098 (for 11/04/2019-30/11/2021, 964 days). The actual emission reductions achieved

during the monitoring period exceed the estimated values. The percentage of the difference between actual and estimated is %212.

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

Year	PDD ER Estimation	Current Monitoring Period
11.04.2019 – 31.12.2019	39,417	126,242
01.01.2020 – 31.12.2020	52,175	142,428
01.01.2021 – 30.11.2021	45,910	160,428
TOTAL	137,502	429,098

The actual value of emission reduction has been more than estimated in registered PDD; this was since ex-ante estimations are based on conservative default values such as the "collection efficiency", which by default is 50%, and MCF value of 1 by default and a "correction factor" of 0.75 etc. These default values provide a rough ex-ante estimation that is impossible to match precisely with ex-post measuring results. If the default values of the correction factor (0.75) and collection efficiency (50%) were not applied, the FOD model would have resulted in approximately 460,656 tCO_2e. Also, feasibility study conducted during registration was taken as a basis for the calculation of emission reductions considering that the landfill would accept the incoming municipal wastes till 2015; however, upon Kayseri Metropolitan Municipality's decision, the landfill site continued to accept the wastes till the end of 2018.

A comparison between estimated and the actual net electricity generations for 2019, 2020 and 2021 years is given below. As seen from the Table for 2020 and 2021, actual net electricity generation was more than 36% and 56%, respectively, than the estimated values in the registered PDD.

	2019	2020	2021
Estimated Net Electricity Generation	18,083 MWh	24,907 MWh	22,792 MWh
Actual Net Electricity Generation	24,705 MWh	34,246 MWh	35,645 MWh
Difference	+36.62%	+37.49%	+56.40%

A comparison between estimated methane generation potential and the actual methane generations for 2019, 2020 and 2021 is given in the table below. As seen from the table below, for the years 2019 and 2020, actual methane generation was more than 50% more than the estimated values in the registered PDD. And for the year 2021, actual

methane generation was more than 100% of the estimated values in the registered PDD

	2019	2020	2021
Estimated Methane Generation Potential ($BE_{CH4,SWDS,y}$)	82,116 tCO2e	77,882 tCO2e	67,600 tCO2e
Baseline emissions of LFG from the SWDS during MP ($BE_{CH4,SWDS,y}$)	113,149 tCO2e	124,337 tCO2e	141,739 tCO2e
Difference	+37.79%	+ 59.65%	+109.67%

Additionally, higher LFG capture results from high quality and efficient piping systems laid in the waste, professional engineering design and operation, careful waste terracing and a low percentage of repairs. Finally, the GWP value was taken as 21 in the registered PDD, whereas during the second monitoring period, it was accepted as 25; and during this monitoring period, for the years 2019 and 2020, it was accepted as 25, and for the year 2021, it was accepted as 28. This can result in higher emission reductions also.

Furthermore, as per paragraph 2.1.3 of the GS Rule Clarification "Assessment Approach For Reporting Higher Ex-Post Emission Reductions" published on 04/07/2022, "*the emission reductions will be capped to the upper bound of the sensitivity analysis range for the monitoring period (annual emission reductions values) in which the higher ex-post emission reduction was reported.*"

In the previous monitoring period, the highest registered emissions reductions amounted to 190,102 tCO_2e for 2015. For this monitoring period, the highest emission reductions amounted to 160,428 tCO_2e for 2021, 18.5% less than the higher reported ex-post emission reduction.

Moreover, as per paragraph 2.1.6 of the GS Rule Clarification "Assessment Approach For Reporting Higher Ex-Post Emission Reductions", IRR calculations are reperformed again with the highest net electricity generated in this monitoring period. Because the only relevant parameter that affects the emission reductions and that is also relevant

for the conducted IRR analysis was the net electricity generation, for that reason, IRR analysis was reperformed with 35,645.355 MWh/yr, the highest net electricity generation amount in 2021. However, the booster expenses were an important item for the conducted IRR analysis during registration. Considering that there was only one booster during registration and two boosters after the first monitoring period, the booster-related expenses were also multiplied by two for the reperformed IRR. The resulting IRR was found to be 14.66%, which is still lower than the benchmark value of 20%.

SECTION F. SAFEGUARDS REPORTING

Principles	Mitigation Measures were added to the Monitoring Plan
Principle 9.4 Release of pollutants	**Disposal of leachate:** To demonstrate that the Project does not impact nearby soil conditions, leachate will be safely collected and transferred to the Kayseri Metropolitan Municipality treatment plant. Leachate generated will be treated in the treatment plant of the Kayseri Municipality. A statement from the Kayseri Municipality regarding leachate disposal is provided. Receipts or a signed statement by the Municipality will be obtained by the Project Proponent showing the proper leachate transfer to the treatment plant.

There is no assessment that has been 'potentially' answered or where requirements require regular re-assessment. (Please see the approved GS Transition document)

SECTION G. STAKEHOLDER INPUTS AND LEGAL DISPUTES

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

The Stakeholder Feedback Round was held between the 24th of December 2011 and the 06th of April 2012. During these four months, all project information was published on web site of FutureCamp Türkiye, enabling stakeholders to reach and comment on the documents. Also, during the validation site visit, DOE met with local people to confirm a physical meeting during the stakeholder feedback round. During the stakeholder feedback round, the local people of Molu village and the mukhtar of the village were informed about the project, and their questions were responded. A logbook for the grievance mechanism and all project documents was left to the mukhtar office. There has been no input received via the Continuous Input and Grievance Mechanism during the approximately nine years. Moreover, during this Monitoring Period, local people and the mukhtar were interviewed and asked for their opinions and concerns

about the project activity. No negative feedback was received from the locals and the mukhtar during this monitoring period.

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

There were no mitigations agreed to be monitored with stakeholders during the validation process of the project activity.

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

No legal contest has arisen with the project during the monitoring period. There is no annual report prepared because the project's transition to the GS4GG was completed on 23/03/2022. As per GS4GG rules, the annual report has to be submitted one year after the transition to GS4GG is completed.

Revision History

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