

المجلس العالمي للبصمة الكربونية  
GLOBAL CARBON COUNCIL



# Project Submission Form

V3.2 - 2020

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<b>COVER PAGE- Project Submission Form (PSF)</b>				
<b>BASIC INFORMATION</b>				
<b>Title of the Project Activity</b>	Yenikent Landfill Gas to Electricity Project			
<b>PSF version number</b>	02			
<b>Date of completion of this form</b>	26/07/2022			
<b>Project Owner(s)</b> <small>(Shall be consistent with De-registered CDM Type B Projects)</small>	ITC-KA Enerji Üretim Sanayi ve Ticaret A.Ş. EKI Energy Services Limited			
<b>Country where the Project Activity is located</b>	Turkey			
<b>GPS coordinates of the project site(s)</b>	<b>Project Name</b>	<b>Coordinate Type</b>	<b>Latitude</b>	<b>Longitude</b>
	Yenikent Landfill Gas to Electricity Project	Landfill Area°	39.9466°	32.4708°
			39.9555°	32.4502°
			39.9558°	32.4513°
			39.9544°	32.4541°
	Power Generation Area	39.9536°	32.4525°	
<b>Eligible GCC Project Type as per the Project Standard</b> <small>(Tick applicable project type)</small>	<input checked="" type="checkbox"/> <b>Type A:</b> <input type="checkbox"/> Type A1 <input checked="" type="checkbox"/> Type A2  <input type="checkbox"/> <b>Type B – De-registered CDM Projects:<sup>1</sup></b> <input type="checkbox"/> Type B1 <input type="checkbox"/> Type B2			

<sup>1</sup> Owners of Type B projects shall fill in the form provided in Appendix 7.

<b>Minimum compliance requirements</b>	<input checked="" type="checkbox"/> Real and Measurable GHG Reductions <input checked="" type="checkbox"/> National Sustainable Development Criteria (if any) <input checked="" type="checkbox"/> Apply credible baseline and monitoring methodologies <input checked="" type="checkbox"/> Additionality <input checked="" type="checkbox"/> Local Stakeholder Consultation Process <input checked="" type="checkbox"/> Global Stakeholder Consultation Process <input checked="" type="checkbox"/> No GHG Double Counting <input checked="" type="checkbox"/> Contributes to United Nations Sustainable Development Goal 13 (Climate Action)																														
<b>Choose optional and additional requirements</b> <small>(Tick applicable label categories)</small>	<input checked="" type="checkbox"/> Do-no-net-harm Safeguards to address Environmental Impacts <input checked="" type="checkbox"/> Do-no-net-harm Safeguards to address Social Impacts <input checked="" type="checkbox"/> Contributes to United Nations Sustainable Development Goals (in addition to Goal 13)																														
<b>Applied methodologies</b> <small>(Shall be approved by the GCC or the CDM)</small>	ACM0001: Flaring or use of landfill gas - Version 19.0 <sup>2</sup>																														
<b>GHG Sectoral scope(s) linked to the applied methodology(ies)</b>	GHG-SS # 1 Energy industries (renewable/non-renewable sources) GHG-SS # 13 Waste handling and disposal																														
<b>Applicable Rules and Requirements for Project Owners</b> <small>(Tick applicable Rules and Requirements)</small>	<table border="1"> <thead> <tr> <th colspan="2">Rules and Requirements</th> <th>Reference</th> <th>Version</th> </tr> </thead> <tbody> <tr> <td colspan="2"><input checked="" type="checkbox"/> ISO 14064-2</td> <td></td> <td></td> </tr> <tr> <td colspan="2"><input checked="" type="checkbox"/> Applicable host country legal requirements /rules</td> <td></td> <td></td> </tr> <tr> <td rowspan="5"><input checked="" type="checkbox"/> GCC Rules and Requirements<sup>3</sup></td> <td><input checked="" type="checkbox"/> Project Standard</td> <td>31/12/2020</td> <td>03.1</td> </tr> <tr> <td><input type="checkbox"/> Approved GCC Methodology (XXXXX)</td> <td></td> <td></td> </tr> <tr> <td><input checked="" type="checkbox"/> Program Definitions</td> <td>31/12/2020</td> <td>03.1</td> </tr> <tr> <td><input checked="" type="checkbox"/> Environment and Social Safeguards Standard</td> <td>17/08/2020</td> <td>02</td> </tr> <tr> <td><input checked="" type="checkbox"/> Project Sustainability Standard</td> <td>31/12/2020</td> <td>02.1</td> </tr> </tbody> </table>			Rules and Requirements		Reference	Version	<input checked="" type="checkbox"/> ISO 14064-2				<input checked="" type="checkbox"/> Applicable host country legal requirements /rules				<input checked="" type="checkbox"/> GCC Rules and Requirements <sup>3</sup>	<input checked="" type="checkbox"/> Project Standard	31/12/2020	03.1	<input type="checkbox"/> Approved GCC Methodology (XXXXX)			<input checked="" type="checkbox"/> Program Definitions	31/12/2020	03.1	<input checked="" type="checkbox"/> Environment and Social Safeguards Standard	17/08/2020	02	<input checked="" type="checkbox"/> Project Sustainability Standard	31/12/2020	02.1
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	<input checked="" type="checkbox"/> Project Sustainability Standard	31/12/2020	02.1																												

<sup>2</sup> <https://cdm.unfccc.int/methodologies/DB/JPYB4DYQUXQPZLBDVPHA87479EMY9M>

<sup>3</sup> GCC Program rules and requirements: <https://www.globalcarboncouncil.com/resource-centre.html>

Project Submission Form

		<input checked="" type="checkbox"/> Instructions in Project Submission Form (PSF)-template	31/12/2020	03.2
		<input type="checkbox"/> Add rows if required		
	<input checked="" type="checkbox"/> CDM Rules <sup>4</sup>	<input checked="" type="checkbox"/> Approved CDM Methodology (XXXXX)	ACM0001	19.0
		<input checked="" type="checkbox"/> Tool for the demonstration and assessment of additionality	TOOL 01	7.0.0
		<input type="checkbox"/> Combined tool to identify the baseline scenario and demonstrate additionality	TOOL 02	
		<input checked="" type="checkbox"/> Tool to calculate the emission factor for an electricity system	TOOL 07	7.0
		<input type="checkbox"/> Demonstration of additionality of microscale project activities	TOOL 19	
		<input type="checkbox"/> Demonstration of additionality of small-scale project activities	TOOL 21	
		<input type="checkbox"/> Additionality of first-of-its-kind project activities	TOOL 23	
		<input checked="" type="checkbox"/> Common practice	TOOL 24	03.1
		<input checked="" type="checkbox"/> Investment analysis	TOOL 27	10.0
		<input type="checkbox"/> Positive lists of technologies	TOOL 32	
		<input type="checkbox"/> Guidelines for objective demonstration and assessment of barriers		
		<input checked="" type="checkbox"/> Emissions from solid waste disposal sites	TOOL04	08.0
		<input checked="" type="checkbox"/> Baseline, project and/or leakage emissions from electricity consumption and monitoring of electricity generation	TOOL05	03.0

<sup>4</sup> CDM Program rules: <https://cdm.unfccc.int/Reference/index.html>

		<input checked="" type="checkbox"/> Project emissions from flaring	TOOL06	04.0
<p><b>Choose Third Party External Project Verification by approved GCC Verifiers<sup>5</sup></b></p> <p>(Tick applicable verification categories)</p>	<input checked="" type="checkbox"/> GHG emission reductions (i.e., Approved Carbon Credits <b>(ACCs)</b> ) <input checked="" type="checkbox"/> Environmental No-net-harm Label <b>(E<sup>+</sup>)</b> <input checked="" type="checkbox"/> Social No-net-harm Label <b>(S<sup>+</sup>)</b>  <input checked="" type="checkbox"/> United Nations Sustainable Development Goals <b>(SDG<sup>+</sup>)</b> <input type="checkbox"/> Bronze SDG Label <input type="checkbox"/> Silver SDG Label <input type="checkbox"/> Gold SDG Label <input checked="" type="checkbox"/> Platinum SDG Label <input type="checkbox"/> Diamond SDG Label  <input checked="" type="checkbox"/> CORSIA requirements <b>(C<sup>+</sup>)</b> <input checked="" type="checkbox"/> Host Country Attestation on Double counting			
<p><b>Declaration to be made by the Project Owner(s)<sup>6</sup></b></p> <p>(Tick all applicable statements)</p>	<p>The Project Owner(s) declares that:</p> <input checked="" type="checkbox"/> The Project Activity complies with the eligibility of the applicable project type (A1, A2, B1 or B2) as stipulated by the Project Standard. <input checked="" type="checkbox"/> The Project Activity shall start operations, and start generating emission reductions, on or after 1 January 2016. <input checked="" type="checkbox"/> The Project Activity is eligible to be registered under the GCC program. <input checked="" type="checkbox"/> No carbon credits generated by the proposed Project Activity will be claimed as carbon credits in any other GHG program anywhere in the world, either for compliance or voluntary purposes, for the entire 10-year GCC crediting period. <input checked="" type="checkbox"/> The proposed Project Activity, if Type A, is NOT registered as a GHG Project Activity in any other GHG program or any other voluntary program anywhere in the world. <input checked="" type="checkbox"/> The proposed Project Activity is NOT included as a component Project Activity (CPA) in a registered GHG Programme of Activities (PoA) under any GHG program (such as the CDM or any other voluntary program) anywhere in the world.			

<sup>5</sup> **Note:** GCC Verifiers under the Individual Track are not eligible to conduct verifications for GCC Project Activities whose owners intend to supply carbon credits (ACCs) for use within CORSIA.

<sup>6</sup> The "Project Owner" means the legal entity or organization that has overall control and responsibility for the Project Activity.

Project Submission Form

	<input checked="" type="checkbox"/> The proposed Project Activity is NOT a CPA that has been excluded from a registered PoA under any GHG program (such as the CDM or any other voluntary program) anywhere in the world.  Provide details (if any) below for the boxes ticked above.
	<input checked="" type="checkbox"/> If a GCC project chooses to apply to use ACCs under CORSIA, the Project Owner(s) is required to declare that they are aware that they must obtain and provide to the GCC and its Registry (operated by IHS Markit) a written attestation from the host country's national focal point (e.g., Ministry of Environment or Civil Aviation Authority) or focal point's designee, as required by CORSIA Emissions Unit Eligibility Criteria, which: <ul style="list-style-type: none"> <li><input checked="" type="checkbox"/> Confirms the avoidance of double counting as required by CORSIA;</li> <li><input checked="" type="checkbox"/> Shall be made publicly available prior to the use of units from the host country under CORSIA; and</li> <li><input checked="" type="checkbox"/> Places all responsibility on the Project Owner(s) to replace any and all doubly claimed or counted ACCs by the host country, in the GCC registry operated by IHS Markit.</li> </ul> Provide details below for the boxes ticked above
	The Project Owner(s) declares that: <ul style="list-style-type: none"> <li><input checked="" type="checkbox"/> All of the information provided in this document, including any supporting documents submitted to the GCC or its registry operator IHS Markit at any time, is true and correct;</li> <li><input checked="" type="checkbox"/> They understand that a failure by them to provide accurate information or data, or concealing facts and information, can be considered as negligence, fraud or willful misconduct. Therefore, they are aware that they are fully responsible for any liability that arises as a result of such actions.</li> </ul> Provide details below for the boxes ticked above
<b>Appendixes 1-7</b>	Details about the Project Activity are provided in Appendixes 1 through 7 to this document.
<b>Name, designation, date and signature of the Project Owner(s)</b>	<b>On behalf of EKI Energy Services Limited</b>  <b>Mr. Manish Dabkara</b> (Designation: Managing Director & CEO)



**Signatures with Date**



**Mr. Manish Dabkara**  
**Date: 26/07/2022**

## 1. PROJECT SUBMISSION FORM

### Section A. Description of the Project Activity

#### A.1. Purpose and general description of the Project Activity

Yenikent Landfill Gas to Electricity Project, developed by the ITC-KA Enerji Üretim Sanayi ve Ticaret A.Ş.” (hereafter referred to as the “project owner”) is located at the Yenikent landfill site in Ankara Province of Turkey. The proposed project includes LFG capture/extraction from landfill site and its utilization for power generation. The landfill receives the waste of approximately 1.5 million people living in 16 municipalities of the Ankara Metropolitan Municipality. Approximately 69% of this waste consists of organic materials like pulp, paper & cardboard, food waste, garden waste and other organic waste. The average daily amount of waste landfilled during the crediting period is estimated in the range of 2,247 ton/day.

The objective of the project activity is to develop the landfill as a “zero waste” landfill, where the environmental impacts of the existing and future land filled waste is limited, or even neutralized. The project activity includes implementation of key waste management strategies including implementation of a Land Fill Gas (LFG) extraction and utilization system. The successful implementation of this project activity is considered viable with the income from carbon credits.

The technologies/measures employed as a part of the Project Activity involves:

- Sorting Facility
- Covering of the Landfill Area and Gas Extraction;
- Gas Engines (utilization of the recovered LFG) for power generation.

The baseline scenario includes disposal of municipal waste and its decay at the landfill site, which leads to the emission of landfill gas to the atmosphere. Landfill gas contains approximately 50% methane, which is a potent greenhouse gas (GHG). The baseline scenario for renewable based (using LFG) power generation and supplying to the grid is exiting and upcoming grid connected power plant. In absence of the electricity generated from the project activity, which is fed to the national grid, equivalent quantum of electricity would be generated by the operation of grid-connected power plants (mostly fossil fuel based) and addition of new generation sources into the national grid of Turkey.

The project boundary includes the physical, geographical site of the landfill (Solid waste Disposal site) from where the landfill gas is captured and used for power generation, the power generation unit (gas turbine) at the project site using LFG for power generation and all other power plants/units connected physically to the Turkish national grid<sup>7</sup>.

The proposed project will reduce GHG emissions in three ways:

1. By preventing atmospheric release of methane (landfill gas is vented to the atmosphere in the baseline scenario) through effective recovery of landfill gas. The recovered LFG will be utilized in gas engines for the purpose of power generation;
2. The electricity generated from the project activity will be fed to national grid will there by displacing electricity which otherwise would have been generated by the power plants

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<sup>7</sup> For more details on project boundaries, please refer to Section B.3.

attached to the Turkish grid.

The project activity is operational with a total of 11 gas engines with a total installed capacity of 15.565 MWe. The activity generates approximately 108.955 GWh/annum of energy and delivered to the national grid which is mainly dominated by thermal/fossil fuel-based power plant.

**Table 1: Project Information**

Site	Gas Engine Capacity	Total Installed Capacity (MWm / MWe)	Estimated Gross Generation (GWh)	COD	Usage
Yenikent Solid Waste Landfill in Osmangazi / Bursa	11 x 1.415 MWe	15.565 MWe	108.955	29/05/2020	Sale to grid

The Project activity is expected to result in 91,153 tCO<sub>2</sub>e average emission reductions annually and cumulative emission reduction of 911,532 tCO<sub>2</sub>e over the crediting period

**The project is expected to contribute 5 SDGs which are SDG 7, 8, 9, 11 and 13.**

- **SDG 7 Energy:** The project contributes to the SDG Target 7.2 by increasing the share of renewable energy in the grid energy mix. The generation of electricity utilizing Land fill gas will be fed to the national grid thereby displacing equivalent amount of electricity.
- **SDG 8 Economic Growth:** The project creates direct and indirect employment opportunities during construction and operation phases, including employment opportunities for young people and persons with disabilities thereby contributing to SDG Target 8.5”.
- **SDG 9 Infrastructure, Industrialization:** The project has resulted in the upgradation of infrastructure making it more sustainable including adoption of clean and environmentally sound technologies thereby abating emission of greenhouse gases and contributing to SDG Target 9.4.
- **SDG 11 Make cities and human settlements inclusive, safe, resilient and sustainable:** The project through implementation of effective municipal waste management technology options contributes to SDG Target 11.6.
- **SDG 13 Climate Change:** The project results in avoidance of methane emission (through adoption of effective waste management technology options) as well as avoiding emission of carbon-di-oxide by feeding in clean energy (using land fill gas) to the national grid which would otherwise be generated in fossil fuel powered power plant connected to the grid. The project activity therefore reduces/ avoid greenhouse gas emission and contributes to SDG Target 13.2.

## A.2. Location of the Project Activity

**Host Country:** Republic of Turkey

**Physical Location:** Gökler District Gökler Kümeevleri No:237 Ayaş/Ankara

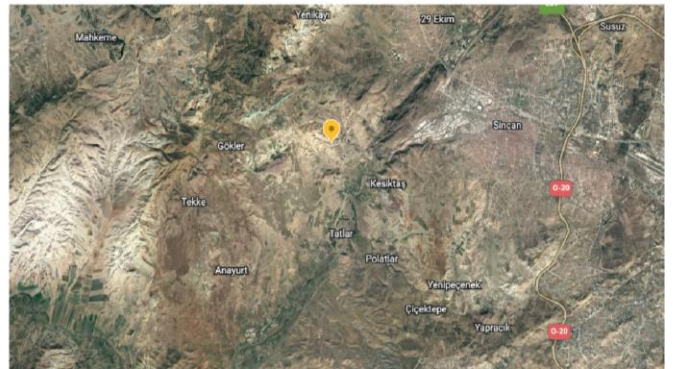
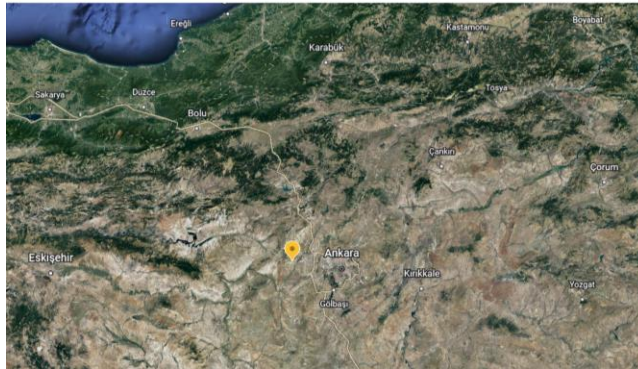
Details regarding location of project is as provided below:

Project Submission Form

**Table 2:** Project Location

Project Name	Coordinate Type	Latitude	Longitude
Yenikent Landfill Gas to Electricity Project	Landfill Area	39.9467°	32.4708°
		39.9556°	32.4503°
		39.9558°	32.4514°
		39.9544°	32.4542°
	Power Generation Area	39.9536°	32.4525°

In Figure 1, the location of project is given in the Turkey map. In addition, location of project site is given in Figure 2 which shows the landfill area and location of the power generation area.



**Figure 1.** Location of the Project Activity in Turkey Map





Figure 2. Location of Project Site

### A.3. Technologies/measures

#### ***Mechanical Sorting Facility:***

The project includes the implementation of a sorting facility. This facility sorts, organic waste and recyclables. Recyclable materials are removed from the waste stream in the recycling center. The waste coming from Municipalities is discharged by garbage trucks and separation of biodegradable waste, residual waste and recyclable wastes carried out in the Mechanical Sorting Facility. Recyclable wastes are separated according to their types (plastic, glass, metal, etc.). Plastic and metal recyclable wastes that are separated are pressed and stored. After the materials that are pressed and stored reach a certain amount, they are utilized within the scope of the Communiqué on the Recovery of Some Non-Hazardous Wastes, which was published in the Official Gazette dated 17.06.2011 and numbered 27967.

#### ***Covering of the Landfill Area and Gas Extraction:***

The project activity will install a comprehensive system for LFG recovery and utilization at the landfill site. The Project mainly consists of the following components: Landfill cover, LFG collection system, electricity generation unit and other controlling / measurement equipment.

**Landfill Cover:** The total landfill area is covered by 50cm-1m thick layer of soil. The waste is covered with soil to block methane emissions to the atmosphere to provide sufficient containment and prevent air or rainwater to get into the waste. The landfill area is terraced in order to reduce the explosion risks and effective usage of the landfill area.

**LFG Collection:** Gas collection system is built in vertical wells in the landfill. The risk of damage during operation is minimized and the gas is collected more efficiently due to the gas collection system. Piping in the landfill begin when the first waste is dumped in the landfill site. In the wild storage area, piping is done to the existing waste heaps. Vertical collection system and horizontal collection system is installed in the wild storage area. A sufficient number of horizontal collection system will be built to the landfill according to the volume of the waste to be dumped. After the solid waste filling of the first cell is finished, the final cover (vegetal cover) will be laid. The technical details

of gas extraction system including suction blower is presented in Table 3.

**Table 3:** Technical Specifications of Blower in the LFG Collection System

Manufacturer	Continental Industrie
Model	Multistage Centrifugal Blower - 051A
Inlet Flow Capacity	4,000 m <sup>3</sup> /h
Inlet and Outlet Head Specifications	DN150, PN10 (6") flange connection, 8 mm (0.31") minimum wall thickness
Discharge Pressure	75 mbar
Number of Stages	1 thru 10 (cast)
Operating Speed	3600 rpm in direct drive (60Hz), 4400 with V-belt

**Energy Generation Units (Gas Engines):**

The captured LFG will be utilized in gas engines for power generation. There are 11 gas engines with 1.415 MWe capacity for each. The annual energy generation is estimated at approximately 108.955 GWh/year. The specifications of gas engines are given in Table 4.

**Table 4:** Gas Engine Specifications used in Project

Manufacturer	Engine Type	Capacity (MWm / MWe)	Total Capacity (MWe)	Gas Volume (Full Load to Part Load)	Electrical Efficiency (Full Load to Part Load)
GE Jenbacher GmbH & Co OG	JGS 420 GS-B121	1.450 MWm / 1.415 MWe	15.565 MWe	755 / 583 / 410 Nm <sup>3</sup> /h	41.6 / 40.4 / 38.1 %

**Grid Connection:**

The power plant is directly connected to the Başkent EDAŞ Sincan TM / Aski I transformer station busbar via 2x477 MCM 34.5 kV power cable.

The current situation and capacities of the project activity could be summarized as follows.

The project activity is up and generating electricity to the national grid, with 11 gas engines with a total installed capacity of 15.565 MWe. The electricity is generated by LFG extraction and utilization (LFG System). The electricity is generated by LFG extraction and utilization (LFG System).

**Leachate Collection:**

Leachate is drained to the impermeable septic tanks (manholes) existing in the landfill and sent to the lagoon with 5,000 m<sup>3</sup> capacity. From the lagoon, leachate is sent to the sewage system of Ankara Municipality (ASKİ)<sup>8</sup> for further treatment. The project owner has an agreement with the Municipality which indicates that collection and treatment of wastewater/leachate is responsibility of Ankara Municipality.

<sup>8</sup> <https://www.aski.gov.tr/TR/ICERIK/Atiksu-Aritma/30>

### Gas flaring system:

The enclosed flaring system will only be used if the captured amount of gas exceeds the amount that can be burned in the gas engines or gas engine is not under operation. Besides the flaring equipment a gas booster and a gas balloon are installed to provide the required discharge pressure. The purpose of the enclosed flaring system is to ensure safety of the project. The technical specifications of the flaring system are given in Table 5.

**Table 5:** Details of Flaring System

<b>Type</b>	Ground Flare
<b>Capacity</b>	8,000 Nm <sup>3</sup> /h
<b>Combustion Temperature</b>	800-1,200°C
<b>Minimum Combustion Pressure</b>	40 mbar

### A.4. Project Owner(s)

**Table 6:** Project Owner Information

<b>Location/ Country</b>	<b>Project Owner(s)</b>	<b>Where applicable<sup>9</sup>, indicate if the host country has provided approval (Yes/No)</b>
Turkey	ITC-KA Enerji Üretim Sanayi ve Ticaret A.Ş.	No
India	EKI Energy Services Limited	No

### A.5. Declaration of intended use of Approved Carbon Credits (ACCs) generated by the Project Activity

The Project Activity is expected to generate ACCs for a full 10-year crediting period and supply the credits to offset the following GHG emissions:

**Table 7:** Project Activity

<b>Period</b>		<b>Name of the Entities</b>	<b>Purpose and Quantity of ACCs to be supplied</b>
<b>From</b>	<b>To</b>		
29/05/2020	28/05/2030	ITC-KA Enerji Üretim Sanayi ve Ticaret A.Ş.	91,153 tCO <sub>2</sub> e/annum.  The project is expected to result in 911,532 tCO <sub>2</sub> e over the period of 10 years.

The project activity is neither registered nor seeking registration in any carbon offsetting program; hence the approved carbon credits (ACCs) from this project activity shall not be double counted. The project owner confirms that the ACC's generated from the project will not be double counted in any other mechanism.

<sup>9</sup> For example, *Project Coordination Form* is to be filled-in by Project Owners for projects located in Qatar. A written attestation from the host country's national focal point or the focal point's designee, as required by CORSIA (Refer section A.5 of the PSF guidelines).

#### **A.6. Additional requirements for CORSIA**

Please refer to section E (for details on compliance to the Environment and Social Safeguards Standard) and F (for details on compliance to the Project Sustainability Standard to ensure that the Project Activity demonstrates the level of contribution towards achieving the United Nations Sustainability Development Goals (SDGs)).



## Section B. Application of selected methodology(ies)

### B.1. Reference to methodology(ies)

Applied approved baseline and monitoring methodology:

- ACM0001: “Flaring or use of landfill gas” Version 19.0<sup>10</sup>

Used tools:

- “Tool for the demonstration and assessment of additionality” Version 07.0.0<sup>11</sup> (current version)
- “Emissions from solid waste disposal sites” Version 08.0<sup>12</sup>
- “Tool to calculate the emission factor for an electricity system” Version 07.0<sup>13</sup>
- “Baseline, project and/or leakage emissions from electricity consumption and monitoring of electricity generation” Version 03.0<sup>14</sup>
- “Project emissions from flaring” Version 04.0<sup>15</sup>
- “Investment analysis” Version 11.0<sup>16</sup>
- “Common Practice” Version 03.1<sup>17</sup>

### B.2. Applicability of methodology(ies)

The project activity involves waste management technologies including LFG extraction and its utilization for power generation. The applicability of the required methodologies and tools have been discussed below. The applicability of the project is validated against the current version of the methodology.

#### Applicability of ACM0001 Version 19.0

For the landfill gas recovery component of the proposed project, the emission reductions resulting from the capture and utilization of landfill gas are calculated using ACM0001 “Flaring or use of landfill gas” (version 19.0).

#### Methodology Scope

This methodology applies to project activities that include the destruction of methane emissions and displacement of a more-GHG-intensive service by capturing landfill gas from the landfill site and/or flaring and/or using to produce energy (i.e., electricity, thermal energy); and/or using to supply consumers through natural gas distribution network, dedicated pipeline or trucks.

Since the project activity involves destruction of methane emissions by capturing landfill gas from the landfill site and using same to produce energy (i.e., electricity) the methodology is applied.

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<sup>10</sup> <https://cdm.unfccc.int/methodologies/DB/JPYB4DYQUXQPZLBDVPHA87479EMY9M>

<sup>11</sup> <https://cdm.unfccc.int/methodologies/PAMethodologies/tools/am-tool-01-v7.0.0.pdf>

<sup>12</sup> <https://cdm.unfccc.int/methodologies/PAMethodologies/tools/am-tool-04-v8.0.pdf>

<sup>13</sup> <https://cdm.unfccc.int/methodologies/PAMethodologies/tools/am-tool-07-v7.0.pdf>

<sup>14</sup> <https://cdm.unfccc.int/methodologies/PAMethodologies/tools/am-tool-05-v3.0.pdf>

<sup>15</sup> <https://cdm.unfccc.int/methodologies/PAMethodologies/tools/am-tool-06-v4.0.pdf>

<sup>16</sup> <https://cdm.unfccc.int/methodologies/PAMethodologies/tools/am-tool-27-v11.0.pdf>

<sup>17</sup> <https://cdm.unfccc.int/methodologies/PAMethodologies/tools/am-tool-24-v1.pdf>

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The applicability of the methodologies and tools have been discussed below:

Ref	Applicability Criteria	Justification
Para 3	<p>The methodology is applicable under the following conditions:</p> <ul style="list-style-type: none"> <li>a. Install a new LFG capture system in an existing or new (Greenfield) SWDS where no LFG capture system was or would have been installed prior to the implementation of the project activity; or</li> <li>b. Make an investment into an existing LFG capture system to increase the recovery rate or change the use of the captured LFG, provided that: <ul style="list-style-type: none"> <li>i. The captured LFG was vented or flared and not used prior to the implementation of the project activity; and</li> <li>ii. In the case of an existing active LFG capture system for which the amount of LFG cannot be collected separately from the project system after the implementation of the project activity and its efficiency is not impacted on by the project system: historical data on the amount of LFG capture and flared is available;</li> </ul> </li> <li>c. Flare the LFG and/or use the captured LFG in any (combination) of the following ways: <ul style="list-style-type: none"> <li>i. Generating electricity;</li> <li>ii. Generating heat in a boiler, air heater or kiln (brick firing only) or glass melting furnace; and/or</li> <li>iii. Supplying the LFG to consumers through a natural gas distribution network;</li> <li>iv. Supplying compressed/ liquefied LFG to consumers using trucks;</li> <li>v. Supplying the LFG to consumers through a dedicated pipeline;</li> </ul> </li> </ul>	<ul style="list-style-type: none"> <li>a. The project includes installation of new LFG capture system in an existing SWDS where no LFG capture system was or would have been installed prior to the implementation of the project activity therefore the methodology condition 3.a is applicable to the project activity.</li> <li>b. The methodology includes installation of new LFG capture system and hence para 3.b is not applicable to the project activity.</li> <li>c. LFG captured is used for the purpose of generation of electricity and hence the methodology condition 3.c is applicable to the project activity. However, during nonfunctioning of gas engine LFG to be flared to avoid atmospheric release of LFG.</li> <li>d. There are no recycling facilities</li> </ul>

	<p>d. Do not reduce the amount of organic waste that would be recycled in the absence of the project activity.</p>	<p>available to which the municipal waste would have been directed in absence of the project. Therefore, the project does not result in reduction of organic waste that would be recycled in the absence of the project activity and hence the methodology condition 3.d is applicable to the project activity.</p>
<p>Para 4</p>	<p>The methodology is only applicable if the application of the procedure to identify the baseline scenario confirms that the most plausible baseline scenario is:</p> <p>a. Atmospheric release of the LFG or capture of LFG and destruction through flaring to comply with regulations or contractual requirements, to address safety and odour concerns, or for other reasons; and</p> <p>b. In the case that the LFG is used in the project activity for generating electricity and/or generating heat in a boiler, air heater, glass melting furnace or kiln:</p> <p>i. For electricity generation: that electricity would be generated in the grid or in captive fossil fuel fired power plants; and/or</p> <p>ii. For heat generation: that heat would be generated using fossil fuels in equipment located within the project boundary;</p>	<p>a. In the baseline situation, the municipal waste was deposited and left for decay at the – uncovered – landfill site, leading to the generation and release of large amounts of landfill gas. Thus, the baseline scenario to the project activity is atmospheric release of the LFG and hence complies to the applicability condition of the methodology.</p> <p>b. The project activity includes utilization of LFG for generating electricity which is being fed to the national grid. The baseline scenario for renewable based (using LFG) power generation and supplying to the grid is exiting and upcoming grid connected power plant. In absence of the electricity generated from the project activity, which is fed to the national grid, equivalent quantum of electricity would be generated by the operation of grid-connected power plants (mostly fossil fuel based) and addition of new generation sources into the national grid of Turkey. Hence the project activity complies to the applicability condition of the methodology.</p>

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	<p>c. In the case of LFG supplied to the end-user(s) through natural gas distribution network, trucks or the dedicated pipeline, the baseline scenario is assumed to be displacement of natural gas.</p> <p>d. In the case of LFG from a Greenfield SWDS, the identified baseline scenario is atmospheric release of the LFG or capture of LFG in a managed SWDS and destruction through flaring to comply with regulations or contractual requirements, to address safety and odour concerns, or for other reasons.</p>	<p>c. The project activity does not include supply of LFG to the end user through natural gas distribution network, trucks or the dedicated pipeline therefore the project activity does not comply to the applicability condition of the methodology</p> <p>d. The project activity includes installation of new LFG capture system in an existing SWDS where no LFG capture system was installed prior to the implementation of the project activity therefore the project activity does not comply to the applicability condition of the methodology</p>
<p>Para 5</p>	<p>This methodology is not applicable:</p> <p>a. In combination with other approved methodologies. For instance, ACM0001 cannot be used to claim emission reductions for the displacement of fossil fuels in a kiln or glass melting furnace, where the purpose of the CDM project activity is to implement energy efficiency measures at a kiln or glass melting furnace;</p> <p>b. If the management of the SWDS in the project activity is deliberately changed during the crediting in order to increase methane generation compared to the situation prior to the implementation of the project activity.</p>	<p>a. The project does not include emission reductions from the displacement of fossil fuels in a kiln or glass melting furnace, where the purpose of the CDM project activity is to implement energy efficiency measures at a kiln or glass melting furnace. Therefore, the project activity complies to the applicability condition of the methodology</p> <p>b. The project activity has not resulted in the change of management of the SWDS in the project activity during the crediting in order to increase methane generation compared to the situation prior to the implementation of the project activity. Therefore, the project activity complies to the applicability condition of the methodology</p>

The baseline scenario of the proposed project is total atmospheric release of the gas (see section

B.4). Thus, the project activity corresponds to ACM0001 “Consolidated methodology Flaring of Landfill gas” (version 19.0) is applicable to the project activity.

In addition, the methodologies also refer to several tools described under section B.1 “Title and reference of the approved baseline and monitoring methodology applied to the project activity”. The applicability of these tools has been discussed below:

**Applicability of “Tool for the demonstration and assessment of additionality” Version 07.0:**

The tool for demonstration and assessment of additionality provides a general framework demonstrating and assessing additionality and is applicable to a wide range of project types. As referred in both methodologies ACM0001 and ACM0022, the additionality tool is applicable for the proposed project activity. The tools have been used in section B.5 for demonstration of additionality.

**Applicability of “Emissions from solid waste disposal sites” Version 08.0:**

Applicability Condition	Justification
<p>The tool can be used to determine emissions for the following types of applications:</p> <p>(a) Application A: The CDM project activity mitigates methane emissions from a specific existing SWDS. Methane emissions are mitigated by capturing and flaring or combusting the methane (e.g. “ACM0001: Flaring or use of landfill gas”). The methane is generated from waste disposed in the past, including prior to the start of the CDM project activity. In these cases, the tool is only applied for an ex-ante estimation of emissions in the project design document (CDM-PDD). The emissions will then be monitored during the crediting period using the applicable approaches in the relevant methodologies (e.g. measuring the amount of methane captured from the SWDS);</p> <p>(b) Application B: The CDM project activity avoids or involves the disposal of waste at a SWDS. An example of this application of the tool is ACM0022, in which municipal solid waste (MSW) is treated with an alternative option, such as composting or anaerobic digestion, and is then prevented from being disposed of in a SWDS. The methane is generated from waste disposed or avoided from disposal during the crediting period. In these cases, the tool can be applied for both ex ante and ex post estimation of emissions. These project activities may apply the simplified approach detailed in 0 when calculating baseline emissions.</p>	<p>The project activity includes capture and utilization of landfill gas for power generation</p> <p>Therefore, the tools are applied for estimation of emission for Applications A type project:</p> <p>(a) Application A: The project activity mitigates methane emissions from a specific existing SWDS. Methane emissions are mitigated by capturing and flaring or combusting the methane (e.g. “ACM0001: Flaring or use of landfill gas”). The methane is generated from waste disposed in the past, including prior to the start of the project activity.</p>
<p>In the case that: (a) different types of residual waste are disposed or prevented from disposal; or that (b) both MSW and residual waste(s) are prevented from</p>	<p>The project activity does not include prevention of disposal of waste both MSW and residual waste(s) and</p>

disposal, then the tool should be applied separately to each residual waste and to the MSW.	therefore does not require separate estimation.
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**Applicability of “Tool to calculate the emission factor for an electricity system” Version 07.0:**

This methodological tool determines the CO<sub>2</sub> emission factor for displacement of electricity generated by power plants in an electricity system, by calculating the “combined margin” emission factor (CM) of the electricity system. This tool maybe applied to estimate the OM, BM and/or CM when calculating baseline emissions for a project activity that substitutes grid electricity. As the proposed project activity supplies electricity to the national grid, the “Tool to calculate the emission factor for an electricity system” v 07 is applicable to the project activity.

<b>Applicability Condition</b>	<b>Justification</b>
This tool may be applied to estimate the OM, BM and/or CM when calculating baseline emissions for a project activity that substitutes grid electricity that is where a project activity supplies electricity to a grid or a project activity that results in savings of electricity that would have been provided by the grid (e.g. demand-side energy efficiency projects).	The project includes generation of electricity that is fed to the grid for the purpose of power generation the baseline of which is grid power. Therefore, this condition of applicable, for estimation of OM, BM and CM using this tool (for calculating of the baseline emission).
Under this tool, the emission factor for the project electricity system can be calculated either for grid power plants only or, as an option, can include off-grid power plants. In the latter case, two sub-options under the step 2 of the tool are available to the project participants, i.e. option IIa and option IIb. If option IIa is chosen, the conditions specified in “Appendix 1: Procedures related to off-grid power generation” should be met. Namely, the total capacity of off-grid power plants (in MW) should be at least 10 per cent of the total capacity of grid power plants in the electricity system; or the total electricity generation by off-grid power plants (in MWh) should be at least 10 per cent of the total electricity generation by grid power plants in the electricity system; and that factors which negatively affect the reliability and stability of the grid are primarily due to constraints in generation and not to other aspects such as transmission capacity.	Since the project activity is grid connected, the condition is applicable and emission factor has been calculated accordingly.

**Applicability of “Baseline, project and/or leakage emissions from electricity consumption and monitoring of electricity generation” Version 03.0:**

This tool provides procedures to estimate the baseline, project and/or leakage emissions associated with the consumption of electricity. The tool is only applicable if certain scenario applies to the sources of electricity consumption. Three possible scenarios have been discussed as follows:

<b>Ref</b>	<b>Applicability Criteria</b>	<b>Justification</b>
A	If emissions are calculated for electricity consumption, the tool is only applicable if one out of the following three scenarios	The proposed project activity includes sourcing of electricity to support the plants operational activity and complies to Scenario A of the

	<p>applies to the sources of electricity consumption:</p> <p>(a) Scenario A: Electricity consumption from the grid. The electricity is purchased from the grid only, and either no captive power plant(s) is/are installed at the site of electricity consumption or, if any captive power plant exists on site, it is either not operating or it is not physically able to provide electricity to the electricity consumer;</p> <p>(b) Scenario B: Electricity consumption from (an) off-grid fossil fuel fired captive power plant(s). One or more fossil fuel fired captive power plants are installed at the site of the electricity consumer and supply the consumer with electricity. The captive power plant(s) is/are not connected to the electricity grid; or</p> <p>(c) Scenario C: Electricity consumption from the grid and (a) fossil fuel fired captive power plant(s). One or more fossil fuel fired captive power plants operate at the site of the electricity consumer. The captive power plant(s) can provide electricity to the electricity consumer. The captive power plant(s) is/are also connected to the electricity grid. Hence, the electricity consumer can be provided with electricity from the captive power plant(s) and the grid.</p>	applicability conditions.
B	<p>This tool can be referred to in methodologies to provide procedures to monitor amount of electricity generated in the project scenario, only if one out of the following three project scenarios applies to the recipient of the electricity generated:</p> <p>(a) Scenario I: Electricity is supplied to the grid;</p> <p>(b) Scenario II: Electricity is supplied to consumers/electricity consuming facilities; or</p> <p>(c) Scenario III: Electricity is supplied to the grid and consumers/electricity consuming facilities</p>	<p>The project entails compliance with Scenario as the project activity includes</p> <p>I: Electricity is supplied to the grid</p>
C	<p>This tool is not applicable in cases where captive renewable power generation technologies are installed to provide</p>	<p>No captive renewable power generation technologies are installed to provide electricity in the project activity, in the baseline scenario</p>



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	electricity in the project activity, in the baseline scenario or to sources of leakage. The tool only accounts for CO <sub>2</sub> emissions.	or to sources of leakage.
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Based on the above arguments it can be concluded that the “Baseline, project and/or leakage emissions from electricity consumption and monitoring of electricity generation’ version 03.0 is applicable to the project activity.

**Applicability of “Project emissions from flaring” Version 04.0**

The project includes capture and utilization of LFG and bio-gas for the purpose of power generation. However, during any non-operational period of gas engine, the recovered LFG and bio-gas are to be flared.

Ref	Applicability Criteria	Justification
2	This tool provides procedures to calculate project emissions from flaring of a residual gas. The tool is applicable to enclosed or open flares and project participants should document in the CDM-PDD the type of flare used in the project activity.	The project activity is designed to capture and utilize LFG as well as bio-gas for power generation. However, during any non-operational period of gas engine, the recovered LFG are to be designed to be flared in enclosed system. The tools are to be applied for estimation of project emission due to flaring.
3	This tool is applicable to the flaring of flammable greenhouse gases where: (a) Methane is the component with the highest concentration in the flammable residual gas; and (b) The source of the residual gas is coal mine methane or a gas from a biogenic source (e.g. biogas, landfill gas or wastewater treatment gas)	The tools are applicable for estimating of project emission from flaring of LFG with highest concentration of the methane and the source of residual gas is biogenic origin i.e landfill gas
4	The tool is not applicable to the use of auxiliary fuels and therefore the residual gas must have sufficient flammable gas present to sustain combustion. In the case of an enclosed flare, there shall be operating specifications provided by the manufacturer of the flare and these shall be followed by the project participant.	The residual gas contains sufficient flammable gas present to sustain combustion and won't require use of auxiliary fuels to sustain combustions.

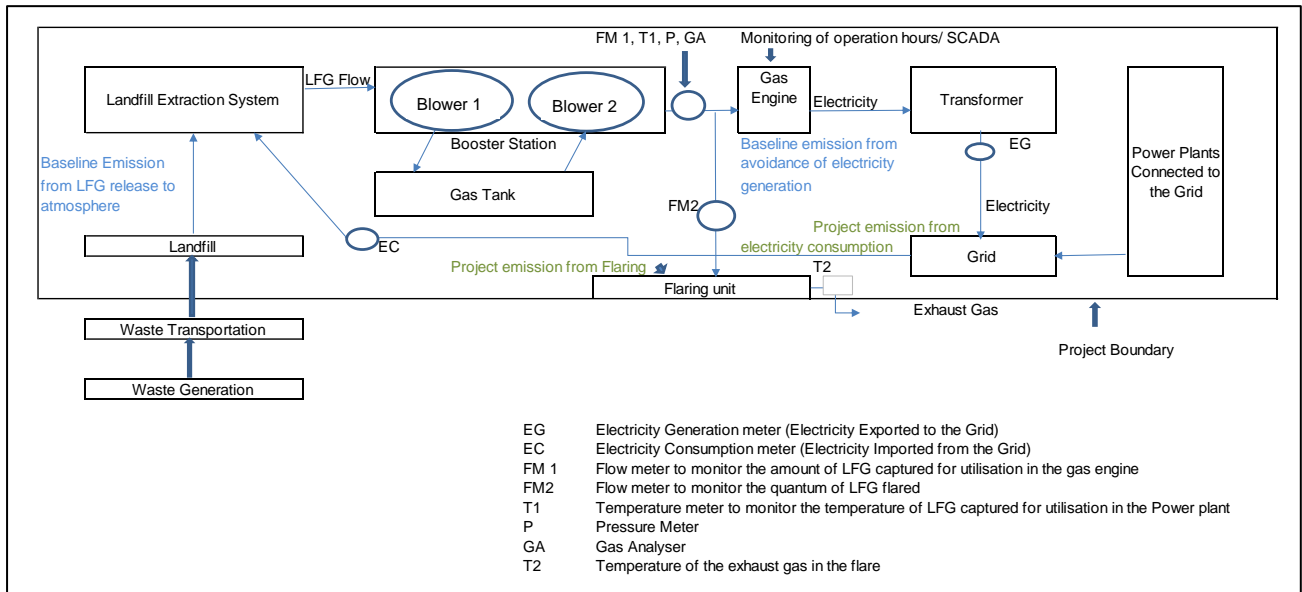
**B.3. Project boundary, sources and greenhouse gases (GHGs)**



The spatial extent of the project boundary encompasses the physical/geographical site of the landfill (SWDS) where the waste was deposited in the baseline scenario and currently in project scenario, landfill gas capturing unit that captures landfill gas and transport it gas engine, and the power plants where the captured landfill gas is used for the purpose of power generation. The spatial extent of this project boundary also includes all power plants connected physically to the electricity system (national grid) that the project power plant is connected to. The project boundary is delineated in Figure below.

This is consistent with;

ACM0001 “Flaring or use of landfill gas”, which defines the project boundary as the site of the project activity where the LFG is flared or used and;



The table below provides an overview of the emissions sources included or excluded from the project boundary for determination of baseline and project emissions.

**Table 8:** Summary of greenhouse gases and sources included in and excluded from the project boundary for LFG capture and power generation unit

Source		GHG	Included?	Justification/Explanation
Baseline	Emissions from decomposition of waste at the SWDS	CO <sub>2</sub>	No	CO <sub>2</sub> emissions from the decomposition of organic waste are not accounted.
		CH <sub>4</sub>	Yes	The major source of emissions in the baseline
		N <sub>2</sub> O	No	N <sub>2</sub> O emissions are small compared to CH <sub>4</sub> emissions from landfills. Exclusion of this gas is conservative.
		CO <sub>2</sub>	Yes	Major emission source

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Source		GHG	Included?	Justification/Explanation
<b>Project activity</b>	Emissions from electricity generation	CH <sub>4</sub>	No	Excluded for simplification. This is conservative.
		N <sub>2</sub> O	No	Excluded for simplification. This is conservative.
	Emissions from on-site electricity use	CO <sub>2</sub>	Yes	This is an important source of emissions in the project activity
		CH <sub>4</sub>	No	Excluded for simplification. This emission source is assumed to be very small.
		N <sub>2</sub> O	No	Excluded for simplification. This emission source is assumed to be very small.
	Emissions from fossil fuel consumption for purposes other than electricity generation or transportation due to the project activity	CO <sub>2</sub>	No	Excluded since no fossil fuel is used by the project activity.
		CH <sub>4</sub>	No	Excluded since no fossil fuel is used by the project activity.
		N <sub>2</sub> O	No	Excluded since no fossil fuel is used by the project activity.
	Emissions from flaring	CO <sub>2</sub>	No	Emissions are considered negligible.
		CH <sub>4</sub>	Yes <sup>18</sup>	Source of emission (The emission due to flaring will be considered in case there is cases of flaring)
		N <sub>2</sub> O	No	Emissions are considered negligible
	Emissions from distribution of LFG using trucks and dedicated pipelines	CO <sub>2</sub>	No	No distribution of LFG using trucks and dedicated pipelines, therefore associated emission is not applicable.
		CH <sub>4</sub>	No	No distribution of LFG using trucks and dedicated pipelines, therefore associated emission is not applicable.
		N <sub>2</sub> O	No	No distribution of LFG using trucks and dedicated pipelines, therefore associated emission is not applicable.

<sup>18</sup> The flare will take place when the electricity generation system (gas engine) is not in operation.

#### B.4. Establishment and description of the baseline scenario

Both methodologies use a stepwise approach according to “Combined tool to identify the baseline scenario and demonstrate additionality” to select the most plausible baseline scenario.

##### **Step 1(a): Define alternative scenarios to the proposed GCC project activity**

This step includes identification of alternative scenarios that provide the same output (service or product) as the proposed project activity

##### **Identification of alternatives scenario for the project activity “Capture and Utilization of Landfill gas” for power generation**

As per the methodologies, the most plausible baseline scenario/alternatives are identified as follows:

Baseline alternatives for the destruction of LFG, shall take into consideration, inter alia, the following alternatives:

Reference	Alternatives	Justification for Selection
LFG 1	The project activity implemented without being registered as a CDM project activity (i.e., capture and flaring or use of LFG)	Implementation of the project activity faces substantial barrier towards including financial unattractiveness (addressed under section B.5) therefore the implementation of the project activity without carbon finance is infeasible and therefore not the baseline alternative.
LFG 2	Atmospheric release of the LFG or capture of LFG in a managed SWDS and destruction through flaring to comply with regulations or contractual requirements, to address safety and odour concerns, or for other reasons;	The project activity is implemented in a unmanaged SWDS therefore the baseline scenario is not applicable to the project case.
LFG 3	Atmospheric release of the LFG or capture of LFG in an unmanaged SWDS and destruction through flaring to comply with regulations or contractual requirements, to address safety and odour concerns, or for other reasons;	Atmospheric release of LFG in an unmanaged SWDS is the most plausible baseline scenario and had been the practice before the implementation of the project activity as there has been no regulation or contractual requirements, to address safety and odour concerns, or for other reasons for capturing and utilizing of LFG.
LFG 4	LFG generation is partially avoided because part of the organic fraction of the solid waste is recycled and not disposed in the SWDS;	There has been no provision for recycling of organic fraction of solid waste, therefore the scenario is not applicable to the project activity.
LFG 5	LFG generation is partially avoided because part of the organic fraction of the solid waste is treated aerobically and not disposed in the SWDS;	There has been no provision for aerobic treatment of organic fraction of solid waste, therefore the scenario is not applicable to the project activity.
LFG 6	LFG generation is partially avoided because part of the organic fraction of the solid waste is incinerated and not disposed in the SWDS.	There has been no provision for incineration of organic fraction of solid waste, therefore the scenario is not applicable to the project activity.

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From above assessment it is evident that LFG 1 and LFG 3 are two baseline alternatives, however “LFG 3” is the most plausible baseline scenario owing to financial barriers forbidding implementation of LFG-1.

Baseline scenario for electricity generation

Reference	Alternatives	Justification for Selection
E 1	Electricity generation from LFG, undertaken without being registered as CDM project activity;	Electricity generation from implementation of LFG capture and power generation system was restricted due to financial unattractiveness (addressed under section B.5) therefore the implementation of the project activity without carbon finance was deemed infeasible.
E 2	Electricity generation in existing or new renewable or fossil fuel based captive power plant(s);	Electricity generation in existing or new renewable or fossil fuel based captive power plant is not a feasible option in the Turkey to meet the power demand as using of grid power is the most feasible options.
E 3	Electricity generation in existing and/or new grid-connected power plants;	Electricity generation in existing and/or new grid connected power plant is the most feasible option.

From above assessment it is evident that E 1 and E 3 are two baseline alternatives, however “E 3” is the most plausible baseline scenario owing to financial barriers forbidding implementation of E1.

Identified baseline scenario for the LFG based power generation

Baseline		Description of the baseline scenario
LFG	Electricity	
LFG 3	E3	Disposal of the waste at unmanaged landfill without the capture and/or flaring of landfill gas resulting in atmospheric release of LFG is the most plausible baseline scenario/alternatives for the destruction of LFG. The electricity generated in the existing/new grid-connected power plants is the most plausible baseline scenario/alternatives for power generation.

Based on the combination of the above alternatives, the following baseline scenarios have been identified for further evaluation.

**Table 9:** Alternative baseline scenarios

Scenario	Baseline		Description of the baseline scenario
	LFG	Electricity	
1	LFG 1	E1	The project activity undertaken without being registered as a project for securing carbon finance although a feasible alternative to the project activity is not opted as baseline scenario since the implementation of the identified alternatives without carbon financing is not a feasible option. A detailed barrier and investment analysis is

			presented under section B.5 of this document.
2	LFG 3	E3,	Continuation of baseline scenario is the most feasible and financially viable options and includes 1. Continuing disposal of the waste at an unmanaged landfill without the capture and/or flaring of landfill gas. 2. The electricity is generated by existing grid connected power plants.

### Step 1.b. Consistency with mandatory laws and regulations

The baseline alternative selected above is in compliance to Related laws and regulations to the proposed project activity are as followed:

- a. Electricity Market Law<sup>19</sup> [Law Number: 4628 Ratification Date: 20.02.2001 Enactment Date: 03.03.2001]
- b. Law on Utilization of Renewable Energy Resources for the Purpose of Generating Electricity Energy<sup>20</sup> [Law Number: 5346 Ratification Date: 10.05.2005 Enactment Date: 18.05.2005]
- c. Environmental Law<sup>21</sup> [Law Number: 2827 Ratification Date: 09.08.1983 Enactment Date: 11.08.1983]
  - I. Regulation on Solid Waste Control<sup>22</sup> [Last updated on 05.04.2005]
  - II. Regulation on Managed Waste Land Filling<sup>23</sup> [Regulation number 27533 Enactment Date: 26.03.2010]

### Relevance of mentioned Laws and Regulations

**Electricity Market Law:** The purpose of this Law is to ensure the development of financially sound and transparent electricity market operating in a competitive environment under provisions of civil law and the delivery of sufficient, good quality, low cost and environment-friendly electricity to consumers and to ensure the autonomous regulation and supervision of this market. Among others, the scope of the law also covers generation of electricity. As one of the important aspects of the proposed project activity is electricity generation, the Electricity Market Law is one of the regulating legislations regarding the project activity.

**Law on Utilization of Renewable Energy Resources for the Purpose of Generating Electricity Energy:** The purpose of this Law is to expand the utilization of renewable energy resources for generating electrical energy, to benefit from these resources in secure, economic and qualified manner, to increase the diversification of energy resources, to reduce greenhouse gas emissions, to assess waste products, to protect the environment and to develop the related manufacturing sector for realizing these objectives.

<sup>19</sup> Reference: The official web page of EMRA;

[http://www.epdk.org.tr/mevzuat/kanun/elektrik/elektrik\\_piyasalari\\_kanunu.pdf](http://www.epdk.org.tr/mevzuat/kanun/elektrik/elektrik_piyasalari_kanunu.pdf)

<sup>20</sup> Reference: The official web page of EMRA; [www.epdk.org.tr/mevzuat/diger/yenilenebilir/yenilenebilir.doc](http://www.epdk.org.tr/mevzuat/diger/yenilenebilir/yenilenebilir.doc)

<sup>21</sup> Reference: The official web page of the Ministry of Environment and Forestry; [www.cevreorman.gov.tr/yasa/k/2872.doc](http://www.cevreorman.gov.tr/yasa/k/2872.doc)

<sup>22</sup> Reference: The official web page of the Ministry of Environment and Forestry; <http://www.cygm.gov.tr/CYGM/Files/mevzuat/yonetmelik/kaky.doc>

<sup>23</sup> Reference: The official web page of the Ministry of Environment and Forestry; [http://www.cygm.gov.tr/CYGM/Files/mevzuat/yonetmelik/Duzenli\\_Depolama.doc](http://www.cygm.gov.tr/CYGM/Files/mevzuat/yonetmelik/Duzenli_Depolama.doc)

**Environmental Law:** This law outlines Turkey’s environmental policy in general terms. It aims to protect the environment and Turkey’s natural resources for the benefit of future generations. It includes the polluter pays principle. Regulations have been issued on air quality protection, water pollution control, environmental impact assessment, waste control, noise control, and the control of hazardous materials. The Environmental Law is one of the main legislations regarding the project activity as it relates to waste management activities. The following two sub regulations of this law are specifically related to the Project Activity:

- Regulation on Solid Waste Control: the regulation doesn’t prescribe any technology options for management of solid waste, nor does it mention any sanction or penalty if solid waste management projects are implemented otherwise. As such the regulation is instructive on the issue of solid waste management rather than normative. Although semi-controlled release of landfill gas to the air (a.k.a. ‘venting’) occurs at several landfills (also see B.5 step 4), the law does not mandate the destruction of methane.

- Regulation on Managed Waste Landfilling: The newly enacted regulation (26.03.2010) on managed waste landfilling aims to (1) minimize the impact of leachate and LFG on soil, air and water quality; (2) regulate waste acceptance to the landfill area; and (3) provide procedures for opening and closure of a landfill area.

**In summary:** Although solid waste management regulation is in place in Turkey, there is no regulatory measures that enforce compliance or enforcement of the project activity. The regulation doesn’t define sanctions or penalties. In practice none of the landfill areas comply with capture and utilization of LFG or treatment of organic fraction of waste, as indicated in statistics on landfill areas<sup>24</sup>. The majority of landfill areas in Turkey are actually ‘waste dumps’ where no waste management (including covering of the landfill) is implemented.

Based on the above arguments it can be concluded that the baseline scenario is the disposal of the waste at a landfill without the capture and/or flaring of landfill gas or treatment of organic fraction of solid waste. The electricity is generated by existing grid-connected power plants.

**Table 10:** Identified baseline scenario for the project activity

Scenario	Baseline		Description of the baseline scenario
	LFG	Electricity	
Scenario 3	LFG 3	E3	Disposal of the waste at a landfill without the capture and/or flaring of landfill gas. The electricity is generated by existing grid-connected power plants.

**Baseline Emission Factor**

Developing the baseline and calculation of the emission reductions for the proposed project activity is calculated according to “Tool to calculate the emission factor of an electricity system” version 07.0. The baseline is the Landfill Methane Recovery identified through the baseline selection procedure.

Emission factor has been calculated in a conservative manner as proposed by the methodology. Basic assumptions made are:

1. Emission factor will remain same over the crediting period,

<sup>24</sup> Please refer to section B.5 Step 4, Common Practice for further details.

2. Emission factor of fuels sources is “0” or the lowest value in the references when there is no information.

According to the “Tool to Calculate the Emission Factor for an Electricity System v 07.0”, Option 1 has been selected.

### Option 1

A delineation of the project electricity system and connected electricity systems published by the DNA or the group of the DNAs of the host country(ies), In case a delineation is provided by a group of DNAs, the same delineation should be used by all the project participants applying the tool in these countries.

The Ministry of Energy and Natural Sources has published the Operating, Build and Combined Margin Emission Factors for Turkish National Grid. The Ministry has calculated the emission factor by using the “Tool to calculate the emission factor for an electricity system” methodology and is presented in the table below.

**Table 11:** The National EF published by Turkish Republic Ministry of Energy<sup>25</sup>

Factor Type	Year	Value (tCO <sub>2</sub> /MWh)
Operational Emission Factor	2019	0.7258
Build Emission Factor	2019	0.4153
Combined Emission Factor	2019	0.5706

### B.5. Demonstration of additionality

The additionality of a GCC Project shall be demonstrated by applying the following approach, consisting of two components: (i) A Legal Requirement Test; and (ii) An Additionality Test either based on a Positive List test or a projects-specific additionality test.

The project is not mandated/enforced by law and is entirely a voluntary activity. Since voluntary commitments/agreements within a sector or by an entity does not constitute the legal requirement, the project is additional as per paragraph 46 of GCC Project Standard.

Specify the methodology or activity requirement or product requirement that establish deemed additionality for the proposed project (including the version number and the specific paragraph, if applicable).	This project applies an approved large-scale methodology ACM0001: Flaring or use of landfill gas Version 19.0 and ACM0022: Alternative waste treatment processes Version 3.0.
Describe how the proposed project meets the criteria for deemed additionality.	1. Project without carbon revenue is not financially attractive and is outlined in investment analysis section below (benchmark and sensitivity analysis).

<sup>25</sup> [https://enerji.enerji.gov.tr/Media/Dizin/BHIM/tr/Duyurular//Bilgi\\_Formu\\_Web\\_Sitesi\\_2019\\_202110071443.pdf](https://enerji.enerji.gov.tr/Media/Dizin/BHIM/tr/Duyurular//Bilgi_Formu_Web_Sitesi_2019_202110071443.pdf) . The Portal have limited/ restricted operation outside turkey, therefore the screenshot of the page can be submitted to the DOE as and when required.



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	<p>2. Continuation of the current scenario of venting of LFG to the atmosphere and dumping of organic fraction of solid waste to the landfill is permitted by regulatory authority of the host country government. Implementation of the project is additional to the baseline scenario which is an alternative to above and therefore reduces the emissions.</p> <p>3. Continuation of the baseline scenario as well as the project activity is in compliance to the local laws and regulations. Both the alternatives (baseline scenario and the project activity) are in compliance with host country laws and regulations required. There is not any mandatory requirement to implement the project activity.</p> <p>4. In accordance with common practice analysis there is no plants similar to the proposed project and built without carbon revenue, the proposed type of project should not be considered as a common practice.</p>
--	--

**Additionality Assessment for large scale project activity Instances**

The table below is only applicable if the proposed project activity is a type of project activity which is deemed automatically additional, as defined by the applied approved methodology or standardized baseline.

Specify the methodology or activity requirement or product requirement that establish deemed additionality for the proposed project (including the version number and the specific paragraph, if applicable).	NA
Describe how the proposed project activity meets the criteria for automatic additionality in the relevant methodology or standardized baselines.	NA

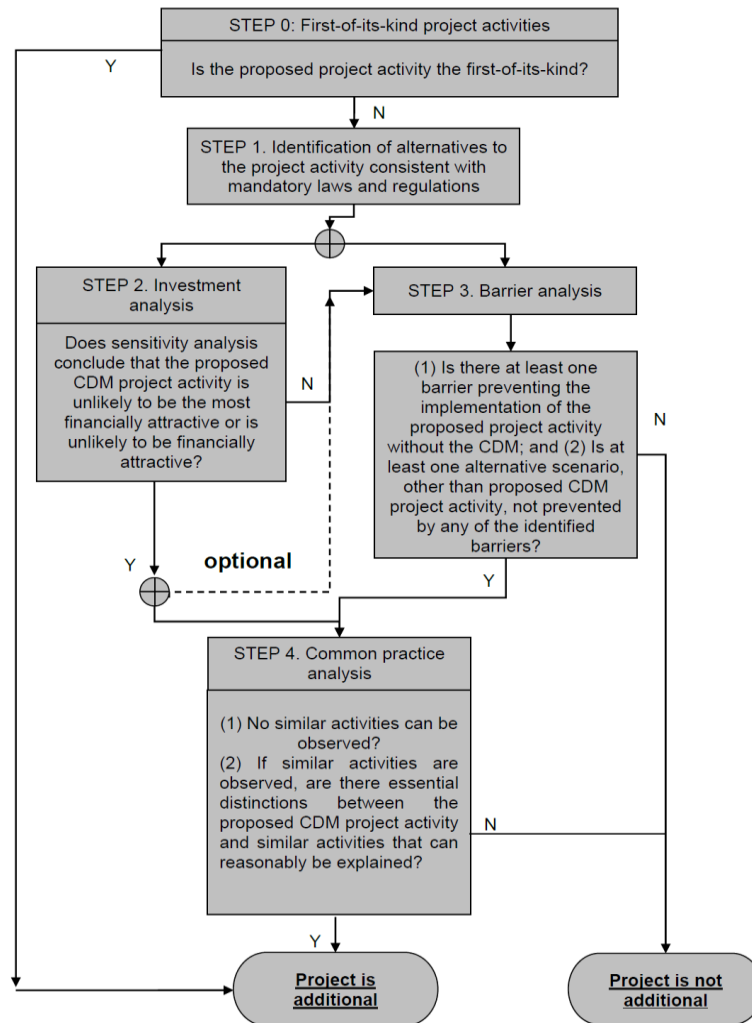
The project activity includes capture and utilization of LFG for generation of electricity, for power generation. Although the project technology complies to positive technology list, but the generation capacity is higher than proposed capacity that can be opted under the positive lists.

The methodology requires the project owner to determine the additionality based on “Methodological Tool- Tool for the demonstration and assessment of additionality”, Version 7.0.0. The tool provides a step-wise approach to demonstrate and assess the additionality of a project (figure below). These steps are:

- (a) Step 0 Demonstration whether the proposed project activity is the first-of-its-kind;
- (b) Step 1 Identification of alternatives to the project activity;
- (c) Step 2 Investment analysis;
- (d) Step 3 Barriers analysis; and
- (e) Step 4 Common practice analysis



Figure 1 Flowchart of the step-wise approach



The stepwise approach to establish additionality of the project activity has been followed, details of which are provided in the following paragraphs:

**Step 0: Demonstration whether the proposed project activity is the first-of-its-kind**

The project activity includes capture and utilization of LFG for power generation. This is not the first such project to be installed in the country or in the region and therefore project activity does not meet this criterion.

**Step 1: Identification of alternatives to the project activity consistent with current laws and regulations**

**Sub-step 1a: Define alternatives to the project activity- Identify realistic and credible alternative(s) available to the project participants or similar project developers that provide outputs or services comparable with the proposed CDM project activity.**

The alternatives to the project activity are established in the section (B.4) above.

Outcome of Sub-step 1.a: Identified realistic and credible alternative scenario(s) to the project activity

**Sub-step 1b: The alternative(s) shall be in compliance with all mandatory applicable legal and regulatory requirements, even if these laws and regulations have objectives other than GHG reductions, e.g. to mitigate local air pollution.**

The alternatives to the project activity as identified above (Section B.4) is in compliance with all mandatory applicable legal and regulatory requirements.

**Step 2: Investment analysis**

Investment analysis is carried out to determine on whether the proposed project activity is economically or financially less attractive than at least one other alternative, identified in step 1, without the revenue from the sale of emission reductions credits. This is demonstrated in in line with the Tools for sections as per “Investment Analysis” (Ver 11.0)

**Sub-step 2a: Determine appropriate analysis method**

The project activity envisages capture and utilisation of LFG for power generation and treatment of organic fraction of solid waste for power generation. The power generated from the project activity is to be exported to the national grid of Turkey and the revenues from the sale would be generated in accordance with the terms and tariffs established in the Agreement with the grid authority. Thus, simple cost analysis (Option I) cannot be used as the analysis method as the sale of the units of generated electricity shall result in a revenue stream during the operations of the Project activity.

In the absence of the project activity continued use of grid electricity would have been the best plausible options and it does not require an investment. Hence investment comparison analysis (Option II) is also not appropriate for the project activity.

After eliminating Option, I and Option II, the use of Benchmark analysis (Option III) is the method of analysis that has been selected as the most suitable method. This method determines the attractiveness of the project activity for the investors, as well as provides a measure of the viability of the investment to generate revenues during its operation, as compared with other avenues and investment options. Hence, the Benchmark analysis method is to be employed for analysis of the said project.

Sub-step 2b (Option III): Apply benchmark analysis

The investment analysis using Benchmark analysis approach (Option III) has been chosen. Further, this method illustrates that the evaluation of the project by the project owner was carried out before the decision to undertake the project was taken and management approval had been granted.

**Choice of Financial Indicator:**

According to the “Tool for demonstration and assessment of Additionality” Version 07.0.0, the financial indicator can be based either on (1) project IRR or (2) equity IRR. There is no general preference between the approaches (1) or (2). The benchmark chosen for analysis shall be fully consistent with the choice of approach. Therefore, in accordance with the guidance, the relevant financial indicator for project activity has been chosen as post tax equity IRR.

**Benchmark estimation:**

Project	Date of Investment Decision	Start / Commissioning Date
Yenikent Landfill Gas to Electricity Project	11/10/2019	29/05/2020

The data defined by World Bank for similar project types are used for benchmark analysis. It is given as 20% for equity IRR by a report generated in May 2017.

Report title: Implementation Completion and Results Report Report No: ICR00004069 Date of Report - June 19, 2017

Report Link:

<https://documents1.worldbank.org/curated/en/799701498842988254/pdf/ICR00004069-06192017.pdf>

In accordance with the aforesaid report financial barriers exists for renewable energy project and desired thresholds (Return on Equity) were assessed as 20%.

### Sub-step 2c: Calculation and comparison of financial indicators (only applicable to Options II and III):

The Post tax Equity IRR is evaluated for the entire lifetime of the project activity and calculated based on the cash outflows from and cash inflows into the project activity. The IRR and Benchmark analysis is calculated in excel spreadsheet and is also summarized below.

Particulars	Unit	Value
Project Start Date		28/11/2019
Investment		
Buildings	US\$	8,003,734
Electromechanical Equipment	US\$	13,081,978
Underground and overland plants	US\$	5,683,365
Others	US\$	1,216,612
Loan (1)	US\$	0
Interest Rate		0
Tenure	Years	0
Equity	US\$	27,985,688
Estimated Annual Electricity Production	MWh/yr	140,000
Electricity Base price first 10 years	(\$/kwh)	0.133
Electricity Base price after 10 years	(\$/kwh)	0.045
Estimated annual OPEX 2022-2025 fixed part	(\$/yr)	2,607,420
Estimated annual OPEX 2022-2025 variable part	(\$/yr)	2.5% of sales

Based on result of IRR excel spreadsheets, equity IRR is assessed to be less than Benchmark. This substantiates that the investment is not financially attractive (Equity IRR for the project activity is less than the Benchmark). Thus, it can be easily concluded that project activity is additional & is not business as usual scenario.

### Sub-step 2d: Sensitivity Analysis

Addressing Guidance under Sensitivity Analysis Version-11.0, following factors has been subjected to sensitivity analysis:

1. Energy Yield

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2. O&M Cost
3. Project Cost
4. Tariff

The rationale of sensitivity is, "The ultimate objective of the sensitivity analysis is to determine the likelihood of the occurrence of a scenario other than the scenario presented, in order to provide a cross-check on the suitability of the assumptions used in the development of the investment analysis."

**Sensitivity Analysis**

The results of sensitivity analysis show that even with a variation of +10% & -10% in project cost, O&M cost, Energy Yield/PLF and Tariff Rate Equity IRR is significantly lower than the benchmark. And it is evident from the results given above; the project remains additional even under the most favourable conditions.

<b>Probability to breach the benchmark:</b>			
Sensitivity Parameter 1 : PLF			
Energy Yield/PLF considered in financials is based on the generation license. Hence, variation in PLF of more than 10% is unlikely to happen as the PLF has been reported by the approving authority.			
Sensitivity Parameter 2: O&M			
The sensitivity analysis reveals that O&M will breach the benchmark at negative values and is hypothetical case. Since the O&M cost is generally subject to escalation and also subject to inflationary pressure, any reduction in the O&M costs is highly unlikely. Hence, the reduction in the O&M cost is highly unlikely.			
Sensitivity Parameter 3: Project Cost			
Project Cost for financial analysis is considered based on the information received from selected vendors, being available at the time of investment decision making to go ahead with the project activity. However, the Sensitivity is carried out for 10% variation and for threshold level below which benchmark is not breached. Thus, it is unlikely that project cost will change beyond sensitivity range			
Sensitivity Parameter 4: Tariff Rate			
The tariff is mostly fixed. Hence, there is no probability to get variation for the same. However, Sensitivity is carried out for +/-10% even then the benchmark is not breached.			

Result of Sensitivity Analysis

Sensitivity Analysis	Equity IRR		
	-10%	Normal	10%
Variation %			
Electricity Yield	10.33%	12.81%	14.83%
O&M	13.40%	12.81	12.19%
Project Cost	14.33%	12.81	11.41%
Tariff Rate	10.33%	12.81	14.83%

**Outcome of Step 2:**

Final Result

Equity IRR without CDM	Benchmark (Equity IRR)
12.81%	20%

Based on the above result, the equity IRR is less than Benchmark.

This substantiates that, the investment is not financially attractive (Equity IRR for the project activity is less than the Benchmark). Thus, it can be easily concluded that, the project activity is additional & is not business as usual scenario.

**Step 3: Barrier analysis**

As per Tool for demonstration and assessment of additionality” (Version 07.0.0), Step 2 or Step 3 or both can be used to demonstrate additionality of the project activity. In this case, Step 3 is not being used for the purpose.

**Step 4: Common practice analysis**

As per para 57 of Tool for demonstration and assessment of additionality” (Version 07.0.0), Step 2 analysis shall be complemented with an analysis of extent to which the proposed project type (e.g., technology or practice) has already diffused in the relevant sector and region. This test is a credibility check to complement the investment analysis.

**Common Practice Analysis – 15.565 MW LFG based power generation project**

Step (1): Calculate applicable capacity or output range as +/-50% of the total design capacity or output of the proposed project activity.

Range	Capacity	Unit
+ 50%	23.35	MW
Capacity of the proposed project activity	15.565	MW
-50%	7.78	MW

Step (2): Identify similar projects (both CDM and non-CDM) which fulfil all of the following conditions:

- The projects are located in the applicable geographical area;
- The projects apply the same measure as the proposed project activity;
- The projects use the same energy source/fuel and feedstock as the proposed project activity, if a technology switch measure is implemented by the proposed project activity;
- The plants in which the projects are implemented produce goods or services with comparable quality, properties and applications areas (e.g. clinker) as the proposed project plant;
- The capacity or output of the projects is within the applicable capacity or output range calculated in;
- The projects started commercial operation before the project design document (CDM-PDD) is published for global stakeholder consultation or before the start date of proposed project activity, whichever is earlier for the proposed project activity.

**Analysis of Step 2**

Identification of the similar projects (CDM and non-CDM) is carried out as per sub-steps of Step (2) as follows:

- As the project is located Turkey, therefore, projects in the geographical area of Turkey have been chosen for analysis. As the project is located in Turkey, the policy applicable for the LFG based power generation project is applicable.
- The project activity is a green-field power project and uses measure (b) “Switch of technology with or without change of energy source including energy efficiency improvement as well as use

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of renewable energies”. Therefore, projects applying same measure (b) are candidates for similar projects.

- The energy source used by the project is LFG. Hence, only energy generation projects using same fuel have been considered for analysis.
- The project produces electricity; therefore, all power plants that produce electricity are candidates for similar projects.
- The capacity range of the projects is within the applicable capacity range from 5.6 MW to 16.8 MW.
- As per the methodological tool the projects that have started commercial operation before the project design document (CDM-PDD) is published for global stakeholder consultation or before the start date of proposed project activity, are to be selected for consideration. The start date however resembles to start date definition of CDM project activity which is “the date on which the project participants commit to making expenditures for the construction or modification of the main equipment or facility (e.g. a wind turbine), or for the provision or modification of a service (e.g. distribution of energy-efficient light bulbs, change of transport management system), for the CDM project activity or CPA. Where a contract is signed for such expenditures, it is the date on which the contract is signed. In other cases, it is the date on which such expenditures are incurred” In line with the start date definition of the CDM the cut off-date for investment analysis is considered as investment decision date which is 11/10/2019.

### Findings of analysis of Step 2

Company Name	COD	Project Name	Installed Capacity (MWe)	GS/VCS/GCC ID
Bientaş Madencilik İnşaat Enerji Petrol Anonim Şirketi	20/09/2018	Bientaş Kaşınhanı Elektrik Üretim Tesisi	9.36	-
ITC Bursa Enerji Üretim Sanayi Ve Ticaret Anonim Şirketi	01/12/2011	ITC Bursa Hamitler Tesisi	9.80	GS1068
ITC Adana Enerji Üretim San. Ve Tic.A.Ş	04/02/2010	ITC Adana Enerji Üretim Tesisi	15.57	GS715
Landfill Enerji Sanayi Ticaret Anonim Şirketi	17/10/2019	Balıkesir Çöp Gaz Elektrik Üretim Tesisi	11.31	VCS2645
Mavibayrak Enerji Üretim A.Ş.	01/06/2016	Mavibayrak-1 Biyokütle Enerji Santrali	12	VCS1933
Akare Biyokütle Enerji Üretim Anonim Şirketi	05/04/2018	Düzce Biyokütle Enerji Üretim Tesisi	12	-
Satem Sinop Biyokütle Enerji Limited Şirketi	16/04/2020	Sinop BES	12	-
Itc-KA Enerji Üretim San.Ve Tic.A.Ş.	04/08/2006	Mamak Katı Atık Alanı Enerji Üretim Tesisi	16.96	GS440
Ortadoğu Enerji Sanayi ve Ticaret Anonim Şirketi	25/10/2007	Kömürcüoda Çöp Gazı Santrali	19.81	GS1336

**Step (3):** Within the projects identified in Step 2, identify those that are neither registered CDM project

activities, project activities submitted for registration, nor project activities undergoing project verification. Note their number,  $N_{all}$ .

Project activities, which have got registered or are under project verification with CDM/VCS/GS/GCC have been excluded in this step. After excluding the registered and under project validation projects the total number of projects.

$N_{all} = 3$

**Step (4):** Within similar projects identified in Step 3, identify those that apply technologies that are different to the technology applied in the proposed project activity. Note their number  $N_{diff}$ .

As per the tool on Common Practice, the project activities have been separated from the different technologies on the basis two criteria:

Different technologies - are technologies that deliver the same output and differ by at least one of the following (as appropriate in the context of the measure applied in the proposed clean development mechanism (CDM) project activity and applicable geographical area):

(a) Energy source/fuel (example: energy generation by different energy sources such as wind and hydro and different types of fuels such as biomass and natural gas);

(b) Feed stock (example: production of fuel ethanol from different feed stocks such as sugar cane and starch, production of cement with varying percentage of alternative fuels or less carbon-intensive fuels);

(c) Size of installation (power capacity)/energy savings:

(i) Micro (as defined in paragraph 24 of decision 2/CMP.5 and paragraph 39 of decision 3/CMP.6);

(ii) Small (as defined in paragraph 28 of decision 1/CMP.2);

(iii) Large.

(d) Investment climate on the date of the investment decision, inter alia:

(i) Access to technology;

(ii) Subsidies or other financial flows;

(iii) Promotional policies;

(iv) Legal regulations.

(e) Other features, inter alia:

(i) Nature of the investment (example: unit cost of capacity or output is considered different if the costs differ by at least 20%).

$N_{diff} = 0$

**Step (5):** Calculate factor  $F = 1 - N_{diff}/N_{all}$  representing the share of similar projects (penetration rate of the measure/technology) using a measure/technology similar to the measure/technology used in the proposed project activity that deliver the same output or capacity as the proposed project activity.

Calculate

$F = 1 - N_{diff}/N_{all}$

$F = 1$



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So, F is greater than 0.2

$N_{all} - N_{diff} = 3$

So,  $N_{all} - N_{diff}$  is not greater than 3

As per the Tool for common practice analysis, version 03.1, the proposed project activity is a common practice within a sector in the applicable geographical area if both the following conditions are fulfilled:

(a) the factor F is greater than 0.2, and

(b)  $N_{all} - N_{diff}$  is less than 3.

Since the value of factor  $N_{all} - N_{diff}$  for the proposed project activity is 3 which is not greater than 3, the project activity is not a “common practice” within sector in the applicable geographical area.

## B.6. Estimation of emission reductions

### B.6.1. Explanation of methodological choices

The emission reductions are calculated as the following equation:

$$ER_y = BE_y - PE_y \quad \dots \text{Equation 26, ACM0001 V 19}$$

Where:

$ER_y$  Emission reductions in year y (tCO<sub>2</sub>e/year)

$BE_y$  Baseline emissions in year y (tCO<sub>2</sub>e/year)

$PE_y$  Project emissions in year y (tCO<sub>2</sub>e/year)

## LFG Capture and its utilization for Power Generation

### Baseline Emissions

The baseline emissions are:

1. Emissions from decomposition of waste at the landfill site
2. Emissions resulting from electricity consumption

Baseline emissions are determined according to equation (1) and comprise the following sources:

$$BE_y = BE_{CH_4,y} + BE_{EC,y} + BE_{HG,y} + BE_{NG,y} \dots \dots \text{Equation 1, ACM0001 V19}$$

Where,

$BE_y$  = Baseline emissions in year y (t CO<sub>2</sub>e/yr)

$BE_{CH_4,y}$  = Baseline emissions of methane from the SWDS in year y (t CO<sub>2</sub>e/yr)

$BE_{EC,y}$  = Baseline emissions associated with electricity generation in year y (t CO<sub>2</sub>/yr)

$BE_{HG,y}$  = Baseline emissions associated with heat generation in year y (t CO<sub>2</sub>/yr)

$BE_{NG,y}$  = Baseline emissions associated with natural gas use in year y (t CO<sub>2</sub>/yr)

However, the project activity does not include generation of heat/thermal energy and use of natural



gas. Therefore:

$$BE_y = BE_{CH_4,y} + BE_{EC,y}$$

**Estimation of Baseline Emission of methane from the SWDS in year ( $BE_{CH_4,y}$ )**

$$BE_{CH_4} = ((1 - OX_{top\_layer}) \times F_{CH_4,PJ,y} - F_{CH_4,BL,y}) \times GWP_{CH_4} \dots \dots \dots \text{Equation 2, ACM0001 V19}$$

Where:

$BE_{CH_4,y}$  = Baseline emissions of methane from the SWDS in year y (t CO<sub>2</sub>e/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)

$F_{CH_4,PJ,y}$  = Amount of methane in the LFG which is flared and/or used in the project activity in year y (t CH<sub>4</sub>/yr)

$F_{CH_4,BL,y}$  = Amount of methane in the LFG that would be flared in the baseline in year y (tCH<sub>4</sub>/yr)

$GWP_{CH_4}$  = Global warming potential of CH<sub>4</sub> (tCO<sub>2</sub>e/tCH<sub>4</sub>)

Since there is no regulation for destroying of methane in landfill gas in the baseline therefore

$$F_{CH_4,BL,y} = 0 \dots \dots \dots \text{Equation 6, ACM0001 V19}$$

**Ex ante estimation of  $F_{CH_4,PJ,y}$**

$$F_{CH_4,PJ,y} = \eta_{PJ} \times BE_{CH_4,SWDS,y} / GWP_{CH_4} \dots \dots \dots \text{Equation 5, ACM0001 V19}$$

Where

$F_{CH_4,PJ,y}$  = Amount of methane in the LFG which is flared and/or used in the project activity in year y (t CH<sub>4</sub>/yr)

$BE_{CH_4,SWDS,y}$  = Amount of methane in the LFG that is generated from the SWDS in the baseline scenario in year y (tCO<sub>2</sub>e/yr). Where  $BE_{CH_4,SWDS,y}$  is determined using the methodological tool “Emissions from solid waste disposal sites”.

$\eta_{PJ}$  = Efficiency of the LFG capture system that will be installed in the project activity

$GWP_{CH_4}$  = Global warming potential of CH<sub>4</sub> (t CO<sub>2</sub>e/t CH<sub>4</sub>)

The amount of methane produced in year y ( $BE_{CH_4, SWDS,y}$ ) is calculated as follows in accordance to Tool 04, Emissions from solid waste disposal sites Version 8:

$$BE_{CH_4,SWDS,y} = \phi \cdot (1 - f) \cdot GWP_{CH_4} \cdot (1 - OX) \cdot \frac{16}{12} \cdot F \cdot DOC_f \cdot MCF \cdot \sum_{x=1}^y \sum_J W_{j,x} \cdot DOC_j \cdot e^{-k_j(y-x)} \cdot (1 - e^{-k_j})$$

..... Equation 1, Tool 4, Version 8

Where:

$BE_{CH_4, SWDS,y}$  Methane emissions avoided during the year y from preventing waste disposal at the solid waste disposal site (SWDS) during the period from the start of the project activity

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	to the end of the year y (tCO <sub>2</sub> e)
φ	Model correction factor to account for model uncertainties
f	Fraction of methane captured at the SWDS and flared, combusted or used in another manner
GWP <sub>CH4</sub>	Global Warming Potential of methane valid for the commitment period (tCO <sub>2</sub> e/tCH <sub>4</sub> )
OX	Oxidation factor (reflecting the amount of methane from SWDS that is oxidized in the soil or other material covering the waste)
F	Fraction of methane in the SWDS gas (volume fraction)
DOC <sub>f</sub>	Fraction of degradable organic carbon (DOC) that can decompose
MCF	Methane correction factor
W <sub>j,x</sub>	Amount of organic waste type j prevented from disposal in the SWDS in the year x (tons)
DOC <sub>j</sub>	Fraction of degradable organic carbon (by weight ) in the waste type j
k <sub>i</sub>	Decay rate for the waste type j
j	Waste type category (index)
x	Year during the crediting period: x runs from the first year of the first crediting period (x=1) to the year y for which avoided emissions are calculated (x=y)
y	Year for which methane emissions are calculated

**Ex-post determination of  $F_{CH4,PJ,y}$**

During the crediting period,  $F_{CH4,PJ,y}$  determined using the methodology ACM0001 Version 19.0. as the sum of the quantities of methane flared and used in power plant(s), boiler(s), air heater(s), glass melting furnace(s), kiln(s) and natural gas distribution, as follows:

$$F_{CH4,PJ,y} = F_{CH4,flared,y} + F_{CH4,EL,y} + F_{CH4,HG,y} + F_{CH4,NG,y} \dots \dots \dots \text{Equation 3, ACM0001 V19}$$

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 CH<sub>4</sub>/yr)
- $F_{CH4,flared,y}$  Amount of methane in the LFG which is destroyed by flaring in year y (t CH<sub>4</sub>/yr)
- $F_{CH4,EL,y}$  Amount of methane in the LFG which is used for electricity generation in year y (t CH<sub>4</sub>/yr)
- $F_{CH4,HG,y}$  Amount of methane in the LFG which is used for heat generation in year y (t CH<sub>4</sub>/yr)
- $F_{CH4,NG,y}$  Amount of methane in the LFG which is sent to the natural gas distribution network and/or dedicated pipeline and/or to the trucks in year y (t CH<sub>4</sub>/yr)

The project activity does not include use of land fill gas for generation of thermal energy and use of natural gas. Although flaring is not practiced in the baseline (In Turkey there is no law that requires the collection and destruction of landfill gas) nor envisaged in the project scenario, the estimation approach considers destruction of methane by flaring. Therefore

$$F_{CH4,PJ,y} = F_{CH4,flared,y} + F_{CH4,EL,y}$$

$F_{CH4,flared,y}$  is determined as the difference between the amount of methane supplied to the flare(s) and any methane emissions from the flare(s), as follows:

$$F_{CH_4, flared, y} = F_{CH_4, sent\_flare, y} - (PE_{flare, y} / GWP_{CH_4}) \dots\dots \text{Equation 4, ACM0001 V19}$$

Where

- $F_{CH_4, flared, y}$  = Amount of methane in the LFG which is destroyed by flaring in year y (t CH<sub>4</sub>/yr)
- $F_{CH_4, sent\_flare, y}$  = Amount of methane in the LFG which is sent to the flare in year y (t CH<sub>4</sub>/yr)
- $PE_{flare, y}$  = Project emissions from flaring of the residual gas stream in year y (t CO<sub>2e</sub>/yr)
- $GWP_{CH_4}$  = Global warming potential of CH<sub>4</sub> (t CO<sub>2e</sub>/t CH<sub>4</sub>)

Where

$F_{CH_4, sent\_flare, y}$  is determined directly using the “Tool to determine the mass flow of a greenhouse gas in a gaseous stream”, applying the requirements described above where the gaseous stream the tool shall be applied to is the LFG delivery pipeline to the flare(s).

$PE_{flare, y}$  shall be determined using the methodological tool “Project emissions from flaring”.

**Baseline emissions from generation of electricity that is displaced by the project activity**

The baseline emissions for the proposed project activity involve emissions resulting from electricity generated by fossil fuel fired power plants connected to the Turkish National grid. The Baseline emissions from generation of electricity is estimated as product of electricity generation and grid emission factor.

The amount of electricity generated from the utilization of LFG extracted from the landfill area will be monitored during the project activity. The emission factor of the Turkish grid ( $CEF_d$ ) is calculated by of Ministry of Energy and Natural Resources in accordance with The Clean Development Mechanism method of the Intergovernmental Panel on Climate Change (IPCC) and published in Turkey National Network Grid Emission Factor Data Sheet<sup>26</sup>:

**Calculation of the Operating Margin Emission Factor**

For OM factor calculation, Chronological order of power generation plants from TEİAŞ Load Dispatch Department with, fuel types, electricity generation for the calculated year were used as input data. By using all the data which were mentioned above, Turkish Ministry of Energy and Natural Resources calculated  $EF_{grid, OMsimple, y}$ <sup>27</sup> :

<b><math>EF_{grid, OMsimple, y} = 0.7258 \text{ tCO}_2/\text{MWh}</math></b>
--

**Calculation of the Build Margin Emission Factor**

For BM factor calculation, Chronological order of power generation plants from TEİAŞ Load Dispatch Department with commissioning dates, plant names, fuel types, installed power values, electricity generation for the calculated year were used as input data. Consequently, Turkish Ministry of Energy and Natural Resources calculated  $EF_{grid, BM, y}$ <sup>28</sup> .

<sup>26</sup> [https://enerji.enerji.gov.tr/Media/Dizin/BHIM/tr/Duyurular/Bilgi\\_Formu\\_Web\\_Sitesi\\_2019\\_202110071443.pdf](https://enerji.enerji.gov.tr/Media/Dizin/BHIM/tr/Duyurular/Bilgi_Formu_Web_Sitesi_2019_202110071443.pdf)  
<sup>27</sup> [https://enerji.enerji.gov.tr/Media/Dizin/BHIM/tr/Duyurular/Bilgi\\_Formu\\_Web\\_Sitesi\\_2019\\_202110071443.pdf](https://enerji.enerji.gov.tr/Media/Dizin/BHIM/tr/Duyurular/Bilgi_Formu_Web_Sitesi_2019_202110071443.pdf)  
<sup>28</sup> [https://enerji.enerji.gov.tr/Media/Dizin/BHIM/tr/Duyurular/Bilgi\\_Formu\\_Web\\_Sitesi\\_2019\\_202110071443.pdf](https://enerji.enerji.gov.tr/Media/Dizin/BHIM/tr/Duyurular/Bilgi_Formu_Web_Sitesi_2019_202110071443.pdf)

$$EF_{grid,BM,y} = 0.4153 \text{ tCO}_2/\text{MWh}$$

### Calculating of the Combined Margin Emission Factor

The combined margin emission factor is calculated by using weighted average CM as per tool formula below:

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

Where:

- $EF_{grid,BM,y}$  Build margin CO<sub>2</sub> emission factor in year y (tCO<sub>2</sub>/MWh)
- $EF_{grid,OM,y}$  Operating margin CO<sub>2</sub> emission factor in year y (tCO<sub>2</sub>/MWh)
- $W_{OM}$  Weighting of operating margin emissions factor (%)
- $W_{BM}$  Weighting of build margin emissions factor (%)

According to the Tool for power generation project activities other than wind and solar;

$$W_{OM} = 0.50 \text{ and } W_{BM} = 0.50$$

Then:

$$EF_{grid,CM,y} = 0.7258 \text{ tCO}_2/\text{MWh} * 0.50 + 0.4153 \text{ tCO}_2/\text{MWh} * 0.50 = 0.5706 \text{ tCO}_2/\text{MWh}$$

$$EF_{grid,CM,y} = 0.5706 \text{ tCO}_2/\text{MWh}$$

### Project Emission

Project emission is calculated as follows

$$PE_y = PE_{EC,y} + PE_{FC,y} + PE_{DT,y} + PE_{SP,y} + \dots \dots \dots \text{Equation 22 ACM0001 V19}$$

Where

- $PE_y$  = Project emissions in year y (t CO<sub>2</sub>/yr)
- $PE_{EC,y}$  = Emissions from consumption of electricity due to the project activity in year y (t CO<sub>2</sub>/yr)
- $PE_{FC,y}$  = Emissions from consumption of fossil fuels due to the project activity, for purpose other than electricity generation, in year y (t CO<sub>2</sub>/yr)
- $PE_{DT,y}$  = Emissions from the distribution of compressed/liqefied LFG using trucks, in year y (t CO<sub>2</sub>/yr)
- $PE_{SP,y}$  = Emissions from the supply of LFG to consumers through a dedicated pipeline, in year y (t CO<sub>2</sub>/yr)

Since the project activity does not include consumption of fossil fuel, distribution of compressed/liqefied LFG using trucks and supply of LFG to consumers through a dedicated

pipeline, therefore

$$PE_y = PE_{EC,y}$$

### **Application of “Tool to determine project emissions from flaring”**

According to “Project emission from flaring” Version 03.0.0”, the project emissions from flaring of the residual gas stream  $PE_{\text{flare},y}$  are determined considering the following steps:

STEP 1: Determination of the mass flow rate of the residual gas

STEP 2: Determination of the hourly flare efficiency

STEP 3: Calculation of project emissions from flaring

The calculation procedure in this tool determines the flow rate of methane before and after the destruction in the flare, taking into account the amount of air supplied to the combustion reaction and the exhaust gas composition (oxygen and methane).

The calculation procedure in this tool determines the project emissions from flaring the residual gas ( $PE_{\text{flare},y}$ ) based on the flare efficiency ( $\eta_{\text{flare},m}$ ) and the mass flow of methane to the flare ( $F_{\text{CH}_4,\text{RG},m}$ ). The flare efficiency is determined for each minute  $m$  of year  $y$  based either on monitored data or default values.

The project activity applies an enclosed flare. The temperature in the exhaust gas of the flare is measured to determine whether the flare is operating or not.

### **STEP 1. Determination of the mass flow rate of the residual gas**

This step calculates the residual gas mass flow rate in each hour  $h$ , based on the volumetric flow rate and the density of the residual gas. The density of the residual gas is determined based on the volumetric fraction of all components in the gas.

The following requirements apply:

- The gaseous stream tool shall be applied to the residual gas;
- The flow of the gaseous stream shall be measured continuously;
- $\text{CH}_4$  is the greenhouse gas  $i$  for which the mass flow should be determined;
- The simplification offered for calculating the molecular mass of the gaseous stream is valid (equation 3 and 17 in the tool); and
- The time interval  $t$  for which mass flow should be calculated is every minute  $m$

$F_{\text{CH}_4,m}$  which is measured as the mass flow during minute  $m$  shall then be used to determine the mass of methane in kilograms fed to the flare in minute  $m$  ( $F_{\text{CH}_4,\text{RG},m}$ ).  $F_{\text{CH}_4,m}$  is determined on wet-dry basis due to difficulties to demonstrate that the temperature is above 60 Celcius.

The calculation follows the procedure as described by the “Tool to determine the mass flow of a greenhouse gas in a gaseous stream”. Option C is applied: Same basis (wet-dry basis) is considered

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for the measurement of the volumetric flow rate of the residual gas and the measurement of the volumetric fraction of methane in the residual gas.

In order to determine the mass flow of CH<sub>4</sub>, the equations mentioned above in the present document shall be used.

The mass flow of greenhouse gas *i* ( $F_{CH_4,t}$ ) is determined as follows:

$$F_{CH_4,t} = V_{t,db} \times v_{CH_4,wb,t} \times \rho_{CH_4,n} \quad \dots \text{Equation 9 in TOOL08 V3}$$

With,

$$\rho_{CH_4,n} = \frac{P_n \times MM_{CH_4}}{R_u \times T_n} \quad \dots \text{Equation 10 in TOOL08 V3}$$

Where:

$F_{CH_4,t}$	Mass flow of greenhouse gas (CH <sub>4</sub> ) in the gaseous stream in time interval <i>t</i> (kg gas/h)
$V_{t,db}$	Volumetric flow of the gaseous stream in time interval <i>t</i> on a dry basis (m <sup>3</sup> dry gas/h)
$v_{CH_4,wb,t}$	Volumetric fraction of greenhouse gas CH <sub>4</sub> in the gaseous stream in a time interval <i>t</i> on a dry basis (m <sup>3</sup> CH <sub>4</sub> /m <sup>3</sup> dry gas)
$\rho_{CH_4,n}$	Density of greenhouse gas CH <sub>4</sub> in the gaseous stream at normal conditions <i>t</i> (kg CH <sub>4</sub> /m <sup>3</sup> CH <sub>4</sub> )
$P_n$	Absolute pressure of the gaseous stream at normal conditions (Pa)
$MM_{CH_4}$	Molecular mass of methane (kg/kmol)
$R_u$	Universal ideal gases constant (Pa.m <sup>3</sup> /kmol.K)
$T_n$	Temperature of the gaseous stream at normal conditions (K)

### STEP 2. Determination of flare efficiency

The determination of the hourly flare efficiency depends on the operation of flare (e.g., temperature), the type of flare used (open or enclosed) and, in case of enclosed flares, the approach selected by project owner to determine the flare efficiency (default value or continuous monitoring).

In the case of Yenikent Landfill Project, an enclosed flare is used, and the flare efficiency is determined by default value, thus Option A. For enclosed flares that are defined as low height flares, the flare efficiency in the minute *m* ( $\eta_{\text{flare},m}$ ) shall be adjusted, as a conservative approach, by subtracting 0.1 from the efficiency as determined in Options A or B

#### Option A: Default value

In case of enclosed flares and use of the default value for the flare efficiency, the flare efficiency in the minute *m* ( $\eta_{\text{flare},m}$ ) is 90% when the following two conditions are met to demonstrate that the flare is operating:

- The temperature of the flare ( $T_{EG,m}$ ) and the flow rate of the residual gas to the flare ( $F_{RG,m}$ ) is within the manufacturer's specifications for the flare ( $SPEC_{\text{flare}}$ ) in minute *m*; and

- The flame is detected in minute m (Flame<sub>m</sub>)

Otherwise, ( $\eta_{flare,m}$ ) is 0%

### STEP 3. Calculation of project emissions from flaring

Project emission from flaring is calculated as the sum of emission from each minute m, based on the methane mass flow in the residual gas ( $F_{CH4,RG,m}$ ) and the flare efficiency ( $\eta_{flare,m}$ ), as follows:

$$PE_{flare,y} = GWP_{CH4} \times \sum_{m=1}^{525600} F_{CH4,RG,m} \times (1 - \eta_{flare,m}) \times 10^{-3} \quad \dots \text{Equation 15 in TOOL06 V4}$$

Where:

$PE_{flare,y}$  Project emissions from flaring of the residual gas in year y (tCO<sub>2</sub>e)  
 $F_{CH4,RG,m}$  Mass flow of methane in the residual gas in the minute m (kg)  
 $\eta_{flare,m}$  Flare efficiency in minute m

### Leakage

No leakage effects are accounted for under this methodology.

### Emission reductions

Emission reductions are calculated as follows:

$$ERy = BEy - PEy \quad \dots \text{Equation 26, ACM0001 V 19}$$

Where:

$ERy$  = Emission reductions in year y (t CO<sub>2</sub>e/yr)  
 $BEy$  = Baseline emissions in year y (t CO<sub>2</sub>e/yr)  
 $PEy$  = Project emissions in year y (t CO<sub>2</sub>/yr)

## B.6.2 Data and parameters fixed ex ante

### Data / Parameter Table 1.

<b>Data / Parameter:</b>	<b>EF<sub>grid,OM,y</sub></b>
Methodology reference	ACM0001 (version 19.0)
Data unit	tCO <sub>2</sub> e/MWh
Description	Operating Margin CO <sub>2</sub> emission factor in year y
Measured/calculated /default	Sourced from Turkey National Network Grid Emission Factor Data Sheet of Ministry of Energy and Natural Resources
Data source	Ministry of Energy and Natural Resources <sup>29</sup>

<sup>29</sup> [https://enerji.enerji.gov.tr/Media/Dizin/BHIM/tr/Duyurular//Bilgi\\_Formu\\_Web\\_Sitesi\\_2019\\_202110071443.pdf](https://enerji.enerji.gov.tr/Media/Dizin/BHIM/tr/Duyurular//Bilgi_Formu_Web_Sitesi_2019_202110071443.pdf)



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Value(s) of monitored parameter	0.7258																		
Measurement/ Monitoring equipment (if applicable)	<table border="1"> <tr> <td colspan="2"><b>Not Applicable</b></td> </tr> <tr> <td>Type of meter</td> <td>Not Applicable</td> </tr> <tr> <td>Location of meter</td> <td>Not Applicable</td> </tr> <tr> <td>Accuracy of meter</td> <td>Not Applicable</td> </tr> <tr> <td>Serial number of meter</td> <td>Not Applicable</td> </tr> <tr> <td>Calibration frequency</td> <td>Not Applicable</td> </tr> <tr> <td>Date of Calibration/ validity</td> <td>Not Applicable</td> </tr> <tr> <td>Reference No. of Calibration Certificate</td> <td>Not Applicable</td> </tr> <tr> <td>Calibration Status</td> <td>Not Applicable</td> </tr> </table>	<b>Not Applicable</b>		Type of meter	Not Applicable	Location of meter	Not Applicable	Accuracy of meter	Not Applicable	Serial number of meter	Not Applicable	Calibration frequency	Not Applicable	Date of Calibration/ validity	Not Applicable	Reference No. of Calibration Certificate	Not Applicable	Calibration Status	Not Applicable
<b>Not Applicable</b>																			
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Location of meter	Not Applicable																		
Accuracy of meter	Not Applicable																		
Serial number of meter	Not Applicable																		
Calibration frequency	Not Applicable																		
Date of Calibration/ validity	Not Applicable																		
Reference No. of Calibration Certificate	Not Applicable																		
Calibration Status	Not Applicable																		
Measuring/reading/ recording frequency (if applicable)	Not Applicable																		
Calculation method (if applicable)	Sourced from Turkey National Network Grid Emission Factor Data Sheet of Ministry of Energy and Natural Resources																		
QA/QC procedures	Not applicable																		
Purpose of data	To estimate Baseline and Project Emission.																		
Additional comments	This parameter is fixed ex-ante for the entire crediting period.																		

**Data / Parameter Table 2.**

<b>Data / Parameter:</b>	<b>EF<sub>grid, BM y</sub></b>
Methodology reference	ACM0001 (version 19.0)
Data unit	tCO <sub>2</sub> e/MWh
Description	Build Margin CO <sub>2</sub> emission factor in year y
Measured/calculated /default	Sourced from Turkey National Network Grid Emission Factor Data Sheet of Ministry of Energy and Natural Resources
Data source	Ministry of Energy and Natural Resources
Value(s) of monitored parameter	0.4153

Measurement/ Monitoring equipment (if applicable)	<b>Not Applicable</b>	
	Type of meter	Not Applicable
	Location of meter	Not Applicable
	Accuracy of meter	Not Applicable
	Serial number of meter	Not Applicable
	Calibration frequency	Not Applicable
	Date of Calibration/ validity	Not Applicable
	Reference No. of Calibration Certificate	Not Applicable
	Calibration Status	Not Applicable
Measuring/reading/ recording frequency (if applicable)	Not Applicable	
Calculation method (if applicable)	Sourced from Turkey National Network Grid Emission Factor Data Sheet of Ministry of Energy and Natural Resources	
QA/QC procedures	Not Applicable	
Purpose of data	To estimate Baseline and Project Emission.	
Additional comments	This parameter is fixed ex-ante for the entire crediting period.	

**Data / Parameter Table 3.**

<b>Data / Parameter:</b>	<b>EF<sub>grid,CM,y</sub></b>
Methodology reference	ACM0001 (version 19.0)
Data unit	tCO <sub>2</sub> e/MWh
Description	Combined Margin CO <sub>2</sub> emission factor in year y
Measured/calculated /default	Sourced from Turkey National Network Grid Emission Factor Data Sheet of Ministry of Energy and Natural Resources
Data source	Ministry of Energy and Natural Resources
Value(s) of monitored parameter	0.5706

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Measurement/ Monitoring equipment (if applicable)	<b>Not Applicable</b>	
	Type of meter	Not applicable
	Location of meter	Not applicable
	Accuracy of meter	Not applicable
	Serial number of meter	Not applicable
	Calibration frequency	Not applicable
	Date of Calibration/ validity	Not applicable
	Reference No. of Calibration Certificate	Not applicable
	Calibration Status	Not applicable
Measuring/reading/ recording frequency (if applicable)	Not Applicable	
Calculation method (if applicable)	<p>The combined margin emissions factor is calculated as follows:  <math>EF_{grid,CM,y} = EF_{grid,OM,y} * W_{OM} + EF_{grid,BM,y} * W_{BM}</math>                      Where:  <math>EF_{grid,BM,y}</math> = Build margin CO<sub>2</sub> emission factor in year y (tCO<sub>2</sub>/MWh)  <math>EF_{grid,OM,y}</math> = Operating margin CO<sub>2</sub> emission factor in year y (tCO<sub>2</sub>/MWh)  <math>W_{OM}</math> = Weighting of operating margin emissions factor (%) = 50%  <math>W_{BM}</math> = Weighting of build margin emissions factor (%) = 25%</p>	
QA/QC procedures	This parameter is fixed ex-ante for the entire crediting period.	
Purpose of data	For the calculation of the Baseline Emission	
Additional comments	This parameter is fixed ex-ante for the entire crediting period.	

**Data / Parameter Table 4.**

Data / Parameter:	Article
Methodology reference	N/A
Data unit	N/A
Description	Regulatory requirements relating to landfill gas projects
Measured/calculated /default	Sourced from Prime Ministry, Directorate of Legislation Development and Publication Official Website
Data source	Prime Ministry, Directorate of Legislation Development and Publication Official Website <a href="http://mevzuat.basbakanlik.gov.tr/mevzuat/metinx.asp?mevzuatkod=7.5.8132&amp;sourceXmlSearch=kat%FD%20at%FDk">http://mevzuat.basbakanlik.gov.tr/mevzuat/metinx.asp?mevzuatkod=7.5.8132&amp;sourceXmlSearch=kat%FD%20at%FDk</a>
Value(s) of monitored parameter	0

Measurement/ Monitoring equipment (if applicable)	<b>Not Applicable</b>	
	Type of meter	Not applicable
	Location of meter	Not applicable
	Accuracy of meter	Not applicable
	Serial number of meter	Not applicable
	Calibration frequency	Not applicable
	Date of Calibration/ validity	Not applicable
	Reference No. of Calibration Certificate	Not applicable
	Calibration Status	Not applicable
Measuring/reading/ recording frequency (if applicable)	Not Applicable	
Calculation method (if applicable)	Not Applicable	
QA/QC procedures	"Directorate of Legislation Development and Publication" under The Prime Ministry is the official governmental organization responsible for publication of any legislative changes in Turkey.	
Purpose of data	-	
Additional comments	Relevant regulations for LFG project activities shall be updated at renewal of each credit period. Changes to regulation will be concerted to the amount of methane that would have been destroyed/combusted during the year in the absence of the project activity ( $MD_{BL,y}$ ).	

#### Data / Parameter Table 5.

<b>Data / Parameter:</b>	<b>GWP<sub>CH4</sub></b>
Methodology reference	ACM0001 (version 19.0)
Data unit	tCO <sub>2</sub> e/tCH <sub>4</sub>
Description	Global warming potential of CH <sub>4</sub>
Measured/calculated /default	Default value
Data source	IPCC 6th Assessment Report (AR6)
Value(s) of monitored parameter	28

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Measurement/ Monitoring equipment (if applicable)	<b>Not Applicable</b>	
	Type of meter	Not applicable
	Location of meter	Not applicable
	Accuracy of meter	Not applicable
	Serial number of meter	Not applicable
	Calibration frequency	Not applicable
	Date of Calibration/ validity	Not applicable
	Reference No. of Calibration Certificate	Not applicable
	Calibration Status	Not applicable
Measuring/reading/ recording frequency (if applicable)	Not Applicable	
Calculation method (if applicable)	Default value of 28 from IPCC fifth Assessment Report (AR5). Shall be updated according to any future COP/MOP decisions.	
QA/QC procedures	-	
Purpose of data	To calculate baseline emissions	
Additional comments	-	

**Flaring of Landfill gas**

**Data / Parameter Table 6.**

<b>Data / Parameter:</b>	<b>OX</b>
Methodology reference	ACM0001 (version 19.0)
Data unit	-
Description	Oxidation factor (reflecting the amount of methane from SWDS that is oxidized in the soil or other material covering the waste)
Measured/calculated /default	Sourced from IPCC 2006
Data source	Based on an extensive review of published literature on this subject, including the IPCC 2006 Guidelines for National Greenhouse Gas Inventories. IPCC 2006 Guidelines for National Greenhouse Gas Inventories <a href="http://www.ipcc-nggip.iges.or.jp/public/2006gl/pdf/5_Volume5/V5_3_Ch3_SWDS.pdf">http://www.ipcc-nggip.iges.or.jp/public/2006gl/pdf/5_Volume5/V5_3_Ch3_SWDS.pdf</a> (Volume 5 / page 3.15)
Value(s) of monitored parameter	0.1

Measurement/ Monitoring equipment (if applicable)		
	Type of meter	Not Applicable
	Location of meter	Not Applicable
	Accuracy of meter	Not Applicable
	Serial number of meter	Not Applicable
	Calibration frequency	Not Applicable
	Date of Calibration/ validity	Not Applicable
	Reference No. of Calibration Certificate	Not Applicable
Calibration Status	Not Applicable	
Measuring/reading/ recording frequency (if applicable)	Not Applicable	
Calculation method (if applicable)	Not Applicable	
QA/QC procedures	Default value	
Purpose of data	To calculate baseline emissions	
Additional comments	The oxidation factor (OX) reflects the amount of CH <sub>4</sub> from SWDS that is oxidized in the soil or other material covering the waste. The baseline scenario the landfill area is uncovered, hence oxidation factor OX is taken zero. The data determined ex-ante will be fixed for the entire crediting period.	

**Data / Parameter Table 7.**

<b>Data / Parameter:</b>	$\eta_{PJ,y}$
Methodology reference	ACM0001 (version 19.0)
Data unit	Percentage
Description	Efficiency of the LFG capture system that will be installed in the project activity
Measured/calculated /default	Default
Data source	Methodology
Value(s) of monitored parameter	50%

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Measurement/ Monitoring equipment (if applicable)		
	Type of meter	Not Applicable
	Location of meter	Not Applicable
	Accuracy of meter	Not Applicable
	Serial number of meter	Not Applicable
	Calibration frequency	Not Applicable
	Date of Calibration/ validity	Not Applicable
	Reference No. of Calibration Certificate	Not Applicable
Calibration Status	Not Applicable	
Measuring/reading/ recording frequency (if applicable)	Not applicable	
Calculation method (if applicable)	Not applicable	
QA/QC procedures	Not applicable	
Purpose of data	For estimation of baseline emission	
Additional comments	The data determined ex-ante will be fixed for the entire crediting period.	

**Data / Parameter Table 8.**

<b>Data / Parameter:</b>	$\phi_y$		
Methodology reference	ACM0001 (version 19.0)		
Data unit	-		
Description	Default value for the model correction factor to account for model uncertainties.		
Measured/calculated /default	Default value		
Data source	"Methodological Tool: Emissions from solid waste disposal sites" (Version 08.0)		
Value(s) of monitored parameter	0.75		
	In accordance with the tool the default value is to be selected based on the type of application and weather conditions.		
	<b>Default values for the model correction factor</b>	<b>Humid/ wet conditions</b>	<b>Dry conditions</b>
	Application A	0.75	0.75
	Application B	0.85	0.80
Where (a) Application A: The project activity mitigates methane emissions from a specific existing SWDS. Methane emissions are mitigated by capturing and flaring or combusting the methane (e.g. "ACM0001: Flaring or use of			



	<p>landfill gas”). The methane is generated from waste disposed in the past, including prior to the start of the GCC project activity. In these cases, the tool is only applied for an ex-ante estimation of emissions in the PSF. The emissions will then be monitored during the crediting period using the applicable approaches in the relevant methodologies (e.g. measuring the amount of methane captured from the SWDS);</p> <p>(b) Application B: The project activity avoids or involves the disposal of waste at a SWDS. An example of this application of the tool is ACM0022, in which municipal solid waste (MSW) is treated with an alternative option, such as composting or anaerobic digestion, and is then prevented from being disposed of in a SWDS. The methane is generated from waste disposed or avoided from disposal during the crediting period. In these cases, the tool can be applied for both ex ante and ex post estimation of emissions. These project activities may apply the simplified approach detailed in 0 when calculating baseline emissions.</p> <p>Average Temperature: 12.6°C</p> <p>Rainfall: 413.6 mm reference: <a href="https://www.mgm.gov.tr/veridegerlendirme/il-ve-ilceler-istatistik.aspx?k=H">https://www.mgm.gov.tr/veridegerlendirme/il-ve-ilceler-istatistik.aspx?k=H</a></p> <p>PET: 614 mm Reference: <a href="http://tucaum.ankara.edu.tr/wp-content/uploads/sites/280/2015/08/tucaum4_4.pdf">http://tucaum.ankara.edu.tr/wp-content/uploads/sites/280/2015/08/tucaum4_4.pdf</a></p> <p>MAP/PET = 413.6 /614 =0.6736</p> <p>Since value of MAP/PET is less than 1 therefore the region is dry region.</p> <p>Since the project activity aligns to Application A of Tools 04: Emission from Solid Waste Disposal sites and associates to dry region the default value of 0.75 is selected.</p>																		
Measurement/ Monitoring equipment (if applicable)	<table border="1"> <tr> <td colspan="2"><b>Not Applicable</b></td> </tr> <tr> <td>Type of meter</td> <td>Not Applicable</td> </tr> <tr> <td>Location of meter</td> <td>Not Applicable</td> </tr> <tr> <td>Accuracy of meter</td> <td>Not Applicable</td> </tr> <tr> <td>Serial number of meter</td> <td>Not Applicable</td> </tr> <tr> <td>Calibration frequency</td> <td>Not Applicable</td> </tr> <tr> <td>Date of Calibration/ validity</td> <td>Not Applicable</td> </tr> <tr> <td>Reference No. of Calibration Certificate</td> <td>Not Applicable</td> </tr> <tr> <td>Calibration Status</td> <td>Not Applicable</td> </tr> </table>	<b>Not Applicable</b>		Type of meter	Not Applicable	Location of meter	Not Applicable	Accuracy of meter	Not Applicable	Serial number of meter	Not Applicable	Calibration frequency	Not Applicable	Date of Calibration/ validity	Not Applicable	Reference No. of Calibration Certificate	Not Applicable	Calibration Status	Not Applicable
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Calibration frequency	Not Applicable																		
Date of Calibration/ validity	Not Applicable																		
Reference No. of Calibration Certificate	Not Applicable																		
Calibration Status	Not Applicable																		

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Measuring/reading/recording frequency (if applicable)	Not applicable
Calculation method (if applicable)	Not applicable
QA/QC procedures	Not applicable
Purpose of data	For estimation of baseline emission
Additional comments	The data determined ex-ante will be fixed for the entire crediting period.

**Data / Parameter Table 9**

<b>Data / Parameter:</b>	<b>F</b>																		
Methodology reference	ACM0001 (version 19.0)																		
Data unit	-																		
Description	Fraction of methane in the SWDS gas (volume fraction)																		
Measured/calculated/default	Default																		
Data source	“Methodological Tool: Emissions from solid waste disposal sites” (Version 08.0) referring to IPCC 2006 Guidelines for National Greenhouse Gas Inventories																		
Value(s) of monitored parameter	0.5																		
Measurement/Monitoring equipment (if applicable)	<table border="1"> <tr> <td colspan="2"><b>Not Applicable</b></td> </tr> <tr> <td>Type of meter</td> <td>Not Applicable</td> </tr> <tr> <td>Location of meter</td> <td>Not Applicable</td> </tr> <tr> <td>Accuracy of meter</td> <td>Not Applicable</td> </tr> <tr> <td>Serial number of meter</td> <td>Not Applicable</td> </tr> <tr> <td>Calibration frequency</td> <td>Not Applicable</td> </tr> <tr> <td>Date of Calibration/validity</td> <td>Not Applicable</td> </tr> <tr> <td>Reference No. of Calibration Certificate</td> <td>Not Applicable</td> </tr> <tr> <td>Calibration Status</td> <td>Not Applicable</td> </tr> </table>	<b>Not Applicable</b>		Type of meter	Not Applicable	Location of meter	Not Applicable	Accuracy of meter	Not Applicable	Serial number of meter	Not Applicable	Calibration frequency	Not Applicable	Date of Calibration/validity	Not Applicable	Reference No. of Calibration Certificate	Not Applicable	Calibration Status	Not Applicable
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Type of meter	Not Applicable																		
Location of meter	Not Applicable																		
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Reference No. of Calibration Certificate	Not Applicable																		
Calibration Status	Not Applicable																		
Measuring/reading/recording frequency (if applicable)	Not Applicable																		
Calculation method (if applicable)	Not Applicable																		
QA/QC procedures	Not Applicable																		
Purpose of data	To calculate baseline emissions																		

Additional comments	This factor reflects the fact that some degradable organic carbon does not degrade, or degrades very slowly, under anaerobic conditions in the SWDS. A default value of 0.5 is recommended by IPCC. The data determined ex-ante will be fixed for the entire crediting period.
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**Data / Parameter Table 10**

<b>Data / Parameter:</b>	<b>DOC<sub>f,default</sub></b>																		
Methodology reference	ACM0001 (version 19.0)																		
Data unit	Weight fraction																		
Description	Default value for the fraction of degradable organic carbon (DOC) in MSW that decomposes in the SWDS																		
Measured/calculated /default	Sourced from IPCC 2006																		
Data source	“Methodological Tool: Emissions from solid waste disposal sites” (Version 08.0) referring to IPCC 2006 Guidelines for National Greenhouse Gas Inventories																		
Value(s) of monitored parameter	0.5																		
Measurement/ Monitoring equipment (if applicable)	<table border="1"> <tr> <td colspan="2"><b>Not Applicable</b></td> </tr> <tr> <td>Type of meter</td> <td>Not Applicable</td> </tr> <tr> <td>Location of meter</td> <td>Not Applicable</td> </tr> <tr> <td>Accuracy of meter</td> <td>Not Applicable</td> </tr> <tr> <td>Serial number of meter</td> <td>Not Applicable</td> </tr> <tr> <td>Calibration frequency</td> <td>Not Applicable</td> </tr> <tr> <td>Date of Calibration/ validity</td> <td>Not Applicable</td> </tr> <tr> <td>Reference No. of Calibration Certificate</td> <td>Not Applicable</td> </tr> <tr> <td>Calibration Status</td> <td>Not Applicable</td> </tr> </table>	<b>Not Applicable</b>		Type of meter	Not Applicable	Location of meter	Not Applicable	Accuracy of meter	Not Applicable	Serial number of meter	Not Applicable	Calibration frequency	Not Applicable	Date of Calibration/ validity	Not Applicable	Reference No. of Calibration Certificate	Not Applicable	Calibration Status	Not Applicable
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Type of meter	Not Applicable																		
Location of meter	Not Applicable																		
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Date of Calibration/ validity	Not Applicable																		
Reference No. of Calibration Certificate	Not Applicable																		
Calibration Status	Not Applicable																		
Measuring/reading/ recording frequency (if applicable)	Not Applicable																		
Calculation method (if applicable)	Not Applicable																		
QA/QC procedures	-																		
Purpose of data	To calculate baseline emissions																		
Additional comments	This factor reflects the fact that some degradable organic carbon does not degrade, or degrades very slowly, in the SWDS. This default value can only be used for: (a) Application A; or (b) Application B if the tool is applied to MSW.																		

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	<p>Since the project activity aligns to Application A therefore default value is selected.</p> <p>The data determined ex-ante will be fixed for the entire crediting period.</p>
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**Data / Parameter Table 11**

<b>Data / Parameter:</b>	<b>MCF</b>																		
Methodology reference	ACM0001 (version 19.0)																		
Data unit	-																		
Description	Methane correction factor																		
Measured/calculated /default	Default																		
Data source	Methodological Tool: Emissions from solid waste disposal sites (Version 08.0) referring to 2006 IPCC Guidelines for National Greenhouse Gas Inventories, Vol. 5 Waste, Chapter-3, Table 3.1																		
Value(s) of monitored parameter	<p>0.4</p> <p>Application A is applicable. The Yenikent Landfill is unmanaged-shallow solid waste disposal sites or stockpiles that are considered SWDS with depth of approximately 4 meters.</p>																		
Measurement/ Monitoring equipment (if applicable)	<table border="1"> <tr> <td colspan="2"></td> </tr> <tr> <td>Type of meter</td> <td>Not Applicable</td> </tr> <tr> <td>Location of meter</td> <td>Not Applicable</td> </tr> <tr> <td>Accuracy of meter</td> <td>Not Applicable</td> </tr> <tr> <td>Serial number of meter</td> <td>Not Applicable</td> </tr> <tr> <td>Calibration frequency</td> <td>Not Applicable</td> </tr> <tr> <td>Date of Calibration/ validity</td> <td>Not Applicable</td> </tr> <tr> <td>Reference No. of Calibration Certificate</td> <td>Not Applicable</td> </tr> <tr> <td>Calibration Status</td> <td>Not Applicable</td> </tr> </table>			Type of meter	Not Applicable	Location of meter	Not Applicable	Accuracy of meter	Not Applicable	Serial number of meter	Not Applicable	Calibration frequency	Not Applicable	Date of Calibration/ validity	Not Applicable	Reference No. of Calibration Certificate	Not Applicable	Calibration Status	Not Applicable
Type of meter	Not Applicable																		
Location of meter	Not Applicable																		
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Serial number of meter	Not Applicable																		
Calibration frequency	Not Applicable																		
Date of Calibration/ validity	Not Applicable																		
Reference No. of Calibration Certificate	Not Applicable																		
Calibration Status	Not Applicable																		
Measuring/reading/ recording frequency (if applicable)	Not Applicable																		
Calculation method (if applicable)	Not Applicable																		
QA/QC procedures	-																		
Purpose of data	To calculate baseline emissions																		
Additional comments	In case that the SWDS does not have a water table above the bottom of the SWDS and in case of application A, then select the applicable value from the following:																		

	<p>(a) 1.0 for anaerobic managed solid waste disposal sites. These must have controlled placement of waste (i.e., waste directed to specific deposition areas, a degree of control of scavenging and a degree of control of fires) and will include at least one of the following: (i) cover material; (ii) mechanical compacting; or (iii) levelling of the waste;</p> <p>(b) 0.5 for semi-aerobic managed solid waste disposal sites. These must have controlled placement of waste and will include all of the following structures for introducing air to the waste layers: (i) permeable cover material; (ii) leachate drainage system; (iii) regulating pondage; and (iv) gas ventilation system;</p> <p>(c) 0.8 for unmanaged solid waste disposal sites – deep. This comprises all SWDS not meeting the criteria of managed SWDS and which have depths of greater than or equal to 5 meters;</p> <p>(d) 0.4 for unmanaged-shallow solid waste disposal sites or stockpiles that are considered SWDS. This comprises all SWDS not meeting the criteria of managed SWDS and which have depths of less than five meters. This includes stockpiles of solid waste that are considered SWDS (according to the definition given for a SWDS)</p> <p>Site Conditions</p> <p>Application Type - A</p> <p>Site Type -</p> <ol style="list-style-type: none"> <li>1. SWDS does not have a water table above the bottom of the SWDS</li> <li>2. Unmanaged solid waste disposal sites</li> </ol> <p>Depth - depth of around 4 meters</p> <p>Since the project activity alligns to application A and relates to unmanaged solid waste disposal sites with depth <b>of around 4 meters</b>, therefore default MCF of 0.4 is selected.</p> <p>The data determined ex-ante will be fixed for the entire crediting period.</p>
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**Data / Parameter Table 12**

<b>Data / Parameter:</b>	<b>DOC<sub>j</sub></b>
Methodology reference	ACM0001 (version 19.0)
Data unit	%
Description	Fraction of degradable organic carbon (by weight) in waste type j
Measured/calculated /default	Default
Data source	Methodological Tool: Emissions from solid waste disposal sites” (Version 08.0) referring to 2006 IPCC Guidelines for National Greenhouse Gas Inventories, adapted from Volume 5, Tables 2.4 and Table 2.5

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Value(s) of monitored parameter	<table border="1"> <thead> <tr> <th>Waste type j</th> <th>DOC<sub>j</sub> (% wet waste)</th> </tr> </thead> <tbody> <tr> <td>Wood and wood products</td> <td>43</td> </tr> <tr> <td>Pulp, paper and cardboard</td> <td>40</td> </tr> <tr> <td>Food, food waste, beverages and tobacco</td> <td>15</td> </tr> <tr> <td>Textiles</td> <td>24</td> </tr> <tr> <td>Garden, yard and park waste 20</td> <td>20</td> </tr> <tr> <td>Glass, plastic, metal, other inert waste</td> <td>0</td> </tr> </tbody> </table> <p>For the following residual waste types, project owner may use or derive default values, as follows:</p> <p>(a) For empty fruit brunches (EFB), as their characteristics are similar to garden waste, the value for garden, yard and park waste in the table above may be used as a default</p> <p>(b) For industrial sludge, either a value of 9 percent (% wet sludge) may be used as a default, assuming an organic dry matter content of 35 percent, or alternatively, if the percentage of organic dry matter content is known, then the DOC value may be calculated as follows: <math>DOC_j (\% \text{ wet sludge}) = 9 * (\% \text{ organic dry matter content}/35)</math>;</p> <p>(c) For domestic sludge, either a value of 5 per cent (% wet sludge) may be used as a default, assuming an organic dry matter content of 10 per cent, or alternatively, if the percentage of organic dry matter content is known, then the DOC value may be calculated as follows: <math>DOC_j (\% \text{ wet sludge}) = 5 * (\% \text{ organic dry matter content}/10)</math>.</p> <p>If a waste type is not comparable to MSW and cannot clearly be described as a combination of waste types in the table above or if a default value is not available or if the project owner wishes to measure DOC<sub>j</sub>, then project owner should measure DOC<sub>j</sub> in an ignition loss test according to the procedure in EN 15169 or similar national or international standards. This measurement is only required once for each waste type j and the value determined for DOC<sub>j</sub> remains valid during the crediting period</p>	Waste type j	DOC <sub>j</sub> (% wet waste)	Wood and wood products	43	Pulp, paper and cardboard	40	Food, food waste, beverages and tobacco	15	Textiles	24	Garden, yard and park waste 20	20	Glass, plastic, metal, other inert waste	0		
	Waste type j	DOC <sub>j</sub> (% wet waste)															
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Food, food waste, beverages and tobacco	15																
Textiles	24																
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Reference No. of Calibration Certificate	Not Applicable																
Calibration Status	Not Applicable																
Measuring/reading/ recording frequency (if applicable)	Not Applicable																
Calculation method (if applicable)	Not Applicable																

QA/QC procedures	-
Purpose of data	To calculate baseline emissions
Additional comments	The data determined ex-ante will be fixed for the entire crediting period.

### Data / Parameter Table 13

<b>Data / Parameter:</b>	<b>k<sub>j</sub></b>																		
Methodology reference	ACM0001 (version 19.0)																		
Data unit	1/yr.																		
Description	Decay rate for the waste type j																		
Measured/calculated/default	Default																		
Data source	Methodological Tool: Emissions from solid waste disposal sites" (Version 08.0) referring to IPCC 2006 Guidelines for National Greenhouse Gas Inventories (Volume 5, Table 3.3)																		
Value(s) of monitored parameter	<table border="1"> <thead> <tr> <th colspan="2">Waste type j</th> <th>Boreal and Temperate (MAT &lt; 20°C)</th> </tr> <tr> <th colspan="2"></th> <th>Dry (MAP/PET &lt;1)</th> </tr> </thead> <tbody> <tr> <td rowspan="2">Slowly degrading</td> <td>Pulp, paper, cardboard</td> <td>0.04</td> </tr> <tr> <td>Wood, wood products and straw</td> <td>0.02</td> </tr> <tr> <td>Moderately degrading</td> <td>Other (non-food) organic putrescible garden and park waste</td> <td>0.05</td> </tr> <tr> <td>Rapidly degrading</td> <td>Food, food waste, sewage sludge, beverages and tobacco</td> <td>0.06</td> </tr> </tbody> </table>		Waste type j		Boreal and Temperate (MAT < 20°C)			Dry (MAP/PET <1)	Slowly degrading	Pulp, paper, cardboard	0.04	Wood, wood products and straw	0.02	Moderately degrading	Other (non-food) organic putrescible garden and park waste	0.05	Rapidly degrading	Food, food waste, sewage sludge, beverages and tobacco	0.06
	Waste type j		Boreal and Temperate (MAT < 20°C)																
			Dry (MAP/PET <1)																
	Slowly degrading	Pulp, paper, cardboard	0.04																
		Wood, wood products and straw	0.02																
	Moderately degrading	Other (non-food) organic putrescible garden and park waste	0.05																
Rapidly degrading	Food, food waste, sewage sludge, beverages and tobacco	0.06																	
Temperature condition to establish the rationale: Mean annual temperature – 12.6°C <sup>30</sup>																			
MAP (Mean annual precipitation) – 413.6 mm <sup>30</sup> PET (Potential evapotranspiration) – 614 mm <sup>31</sup>																			
MAP/PET = 413.6/614 = 0.6736																			
Based on the above weather parameter the value of MAP/PET is estimated to be below 1 therefore the default value of decay rate for Boreal and Temperate region with specific to Dry region is selected.																			

<sup>30</sup> <https://www.mgm.gov.tr/veridegerlendirme/il-ve-ilceler-istatistik.aspx?k=H>

<sup>31</sup> [http://tucaum.ankara.edu.tr/wp-content/uploads/sites/280/2015/08/tucaum4\\_4.pdf](http://tucaum.ankara.edu.tr/wp-content/uploads/sites/280/2015/08/tucaum4_4.pdf)



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Measurement/ Monitoring equipment (if applicable)	<b>Not Applicable</b>	
	Type of meter	Not Applicable
	Location of meter	Not Applicable
	Accuracy of meter	Not Applicable
	Serial number of meter	Not Applicable
	Calibration frequency	Not Applicable
	Date of Calibration/ validity	Not Applicable
	Reference No. of Calibration Certificate	Not Applicable
	Calibration Status	Not Applicable
Measuring/reading/ recording frequency (if applicable)	Not Applicable	
Calculation method (if applicable)	Not Applicable	
QA/QC procedures	-	
Purpose of data	To calculate baseline emissions	
Additional comments	The data determined ex-ante will be fixed for the entire crediting period.	

**Data / Parameter Table 14**

<b>Data / Parameter:</b>	<b>R<sub>u</sub></b>
Methodology reference	ACM001 (version 19.0)
Data unit	Pa.m <sup>3</sup> /kmol.K
Description	Universal ideal gases constant
Measured/calculated /default	Default
Data source	Methodological Tool: Tool to determine the mass flow of a greenhouse gas in a gaseous stream” (Version 03.0)
Value(s) of monitored parameter	8,314

Measurement/ Monitoring equipment (if applicable)		
	Type of meter	Not Applicable
	Location of meter	Not Applicable
	Accuracy of meter	Not Applicable
	Serial number of meter	Not Applicable
	Calibration frequency	Not Applicable
	Date of Calibration/ validity	Not Applicable
	Reference No. of Calibration Certificate	Not Applicable
Calibration Status	Not Applicable	
Measuring/reading/ recording frequency (if applicable)	Not Applicable	
Calculation method (if applicable)	Not Applicable	
QA/QC procedures	-	
Purpose of data	To calculate baseline emissions	
Additional comments	The data determined ex-ante will be fixed for the entire crediting period.	

#### Data / Parameter Table 15

<b>Data / Parameter:</b>	<b>MM<sub>i</sub></b>		
Methodology reference	ACM001 (version 19.0)		
Data unit	kg/kmol		
Description	Molecular mass of greenhouse gas i		
Measured/calculated /default	Default		
Data source	Methodological Tool: Tool to determine the mass flow of a greenhouse gas in a gaseous stream" (Version 03.0)		
Value(s) of monitored parameter	<b>Compound</b>	<b>Structure</b>	<b>Molecular mass (kg / kmol)</b>
	Methane	CH <sub>4</sub>	16.04

Project Submission Form

Measurement/ Monitoring equipment (if applicable)		
	Type of meter	Not Applicable
	Location of meter	Not Applicable
	Accuracy of meter	Not Applicable
	Serial number of meter	Not Applicable
	Calibration frequency	Not Applicable
	Date of Calibration/ validity	Not Applicable
	Reference No. of Calibration Certificate	Not Applicable
Calibration Status	Not Applicable	
Measuring/reading/ recording frequency (if applicable)	Not Applicable	
Calculation method (if applicable)	Not Applicable	
QA/QC procedures	-	
Purpose of data	To calculate baseline emissions	
Additional comments	The data determined ex-ante will be fixed for the entire crediting period.	

**Data / Parameter Table 16**

<b>Data / Parameter:</b>	<b>MM<sub>H2O</sub></b>
Methodology reference	ACM001 (version 19.0)
Data unit	kg/kmol
Description	Molecular mass of water
Measured/calculated /default	Default
Data source	Methodological Tool: Tool to determine the mass flow of a greenhouse gas in a gaseous stream” (Version 03.0)
Value(s) of monitored parameter	18.0152

Measurement/ Monitoring equipment (if applicable)		
	Type of meter	Not Applicable
	Location of meter	Not Applicable
	Accuracy of meter	Not Applicable
	Serial number of meter	Not Applicable
	Calibration frequency	Not Applicable
	Date of Calibration/ validity	Not Applicable
	Reference No. of Calibration Certificate	Not Applicable
Calibration Status	Not Applicable	
Measuring/reading/ recording frequency (if applicable)	Not Applicable	
Calculation method (if applicable)	Not Applicable	
QA/QC procedures	-	
Purpose of data	To calculate baseline emissions	
Additional comments	The data determined ex-ante will be fixed for the entire crediting period.	

#### Data / Parameter Table 17

<b>Data / Parameter:</b>	<b>P<sub>n</sub></b>
Methodology reference	ACM001 (version 19.0)
Data unit	Pa
Description	Total pressure at normal conditions
Measured/calculated /default	Default
Data source	Methodological Tool: Tool to determine the mass flow of a greenhouse gas in a gaseous stream” (Version 03.0)
Value(s) of monitored parameter	101,325 Pa

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Measurement/ Monitoring equipment (if applicable)		
	Type of meter	Not Applicable
	Location of meter	Not Applicable
	Accuracy of meter	Not Applicable
	Serial number of meter	Not Applicable
	Calibration frequency	Not Applicable
	Date of Calibration/ validity	Not Applicable
	Reference No. of Calibration Certificate	Not Applicable
Calibration Status	Not Applicable	
Measuring/reading/ recording frequency (if applicable)	Not Applicable	
Calculation method (if applicable)	Not Applicable	
QA/QC procedures	-	
Purpose of data	To calculate baseline emissions	
Additional comments	The data determined ex-ante will be fixed for the entire crediting period.	

**Data / Parameter Table 18**

<b>Data / Parameter:</b>	<b>T<sub>n</sub></b>
Methodology reference	ACM001 (version 19.0)
Data unit	K
Description	Temperature at normal conditions
Measured/calculated /default	Default
Data source	Methodological Tool: Tool to determine the mass flow of a greenhouse gas in a gaseous stream” (Version 03.0)
Value(s) of monitored parameter	273.15 K

Measurement/ Monitoring equipment (if applicable)		
	Type of meter	Not Applicable
	Location of meter	Not Applicable
	Accuracy of meter	Not Applicable
	Serial number of meter	Not Applicable
	Calibration frequency	Not Applicable
	Date of Calibration/ validity	Not Applicable
	Reference No. of Calibration Certificate	Not Applicable
Calibration Status	Not Applicable	
Measuring/reading/ recording frequency (if applicable)	Not Applicable	
Calculation method (if applicable)	Not Applicable	
QA/QC procedures	-	
Purpose of data	To calculate baseline emissions	
Additional comments	The data determined ex-ante will be fixed for the entire crediting period.	

#### Data / Parameter Table 19

<b>Data / Parameter:</b>	$\eta_{flare,m}$
Methodology reference	ACM001 (version 19.0)
Data unit	%
Description	flare efficiency
Measured/calculated /default	Default
Data source	Methodological Tool: Project Emission from Flaring” (Version 03.0)
Value(s) of monitored parameter	90%

Project Submission Form

Measurement/ Monitoring equipment (if applicable)		
	Type of meter	Not Applicable
	Location of meter	Not Applicable
	Accuracy of meter	Not Applicable
	Serial number of meter	Not Applicable
	Calibration frequency	Not Applicable
	Date of Calibration/ validity	Not Applicable
	Reference No. of Calibration Certificate	Not Applicable
	Calibration Status	Not Applicable
Measuring/reading/ recording frequency (if applicable)	Not Applicable	
Calculation method (if applicable)	Not Applicable	
QA/QC procedures	-	
Purpose of data	To calculate project emissions	
Additional comments	The data parameter will be applicable for determining project emission due to flaring. The flare efficiency for the minute m ( $\eta_{\text{flare},m}$ ) is 90% when the following two conditions are met to demonstrate that the flare is operating: (a) The temperature of the flare ( $TEG_{,m}$ ) and the flow rate of the residual gas to the flare ( $FRG_{,m}$ ) is within the manufacturer's operating specification for the flare ( $SPEC_{\text{flare}}$ ) in the minute m; and (b) The flame is detected in the minute m ( $Flame_m$ ). Otherwise $\eta_{\text{flare},m}$ is 0%.	

**B.6.3. Ex-ante calculation of emission reductions**

**Estimation of Baseline emission for Landfill activity**

The baseline emissions include the emissions produced in the absence of the project activity the methane destroyed by the project activity and the baseline emissions from electricity generated utilizing the LFG.

**Estimation of Methane emission potential of a solid waste disposal site**

$$BE_{CH_4, SWDS, y} = \phi \cdot (1 - f) \cdot GWP_{CH_4} \cdot (1 - OX) \cdot \frac{16}{12} \cdot F \cdot DOC_f \cdot MCF \cdot \sum_{x=1}^y \sum_j W_{j,x} \cdot DOC_j \cdot e^{-k_j(y-x)} \cdot (1 - e^{-k_j})$$

..... Equation 1, Tool 4, Version 8

**Where**

$BE_{CH_4, SWDS, y}$  Methane emissions avoided during the year y from preventing waste disposal at the solid waste disposal site (SWDS) during the period from the start of the project activity



	to the end of the year y (tCO <sub>2</sub> e)
φ	Model correction factor to account for model uncertainties
f	Fraction of methane captured at the SWDS and flared, combusted or used in another manner
GWP <sub>CH4</sub>	Global Warming Potential of methane valid for the commitment period (tCO <sub>2</sub> e/tCH <sub>4</sub> )
OX	Oxidation factor (reflecting the amount of methane from SWDS that is oxidized in the soil or other material covering the waste)
F	Fraction of methane in the SWDS gas (volume fraction)
DOC <sub>f</sub>	Fraction of degradable organic carbon (DOC) that can decompose
MCF	Methane correction factor
W <sub>j,x</sub>	Amount of organic waste type j prevented from disposal in the SWDS in the year x (tons)
DOC <sub>j</sub>	Fraction of degradable organic carbon (by weight ) in the waste type j
k <sub>i</sub>	Decay rate for the waste type j
j	Waste type category (index)
x	Year during the crediting period: x runs from the first year of the first crediting period (x=1) to the year y for which avoided emissions are calculated (x=y)
y	Year for which methane emissions are calculated

Input Values used for estimation of methane emission potential is outlined in the tables below:

#### Estimation of Waste

	Pulp, Paper & Cardboard (ton/year)	Food (ton/year)	Garden waste (ton/year)	Other Organic Waste (ton/year)	Inorganic, inert waste	Total waste/year	Total waste/day
	6.64%	52.58%	1.11%	9.08%	30.59%		
2020	54,463	4,31,277	9,105	74,477	2,50,908	8,20,229	2,247
2021	54,463	4,31,277	9,105	74,477	2,50,908	8,20,229	2,247
2022	54,463	4,31,277	9,105	74,477	2,50,908	8,20,229	2,247
2023	54,463	4,31,277	9,105	74,477	2,50,908	8,20,229	2,247
2024	54,463	4,31,277	9,105	74,477	2,50,908	8,20,229	2,247
2025	54,463	4,31,277	9,105	74,477	2,50,908	8,20,229	2,247
2026	54,463	4,31,277	9,105	74,477	2,50,908	8,20,229	2,247
2027	54,463	4,31,277	9,105	74,477	2,50,908	8,20,229	2,247
2028	54,463	4,31,277	9,105	74,477	2,50,908	8,20,229	2,247
2029	54,463	4,31,277	9,105	74,477	2,50,908	8,20,229	2,247
2030	54,463	4,31,277	9,105	74,477	2,50,908	8,20,229	2,247
2031	54,463	4,31,277	9,105	74,477	2,50,908	8,20,229	2,247
2032	54,463	4,31,277	9,105	74,477	2,50,908	8,20,229	2,247
2033	54,463	4,31,277	9,105	74,477	2,50,908	8,20,229	2,247
2034	54,463	4,31,277	9,105	74,477	2,50,908	8,20,229	2,247
2035	54,463	4,31,277	9,105	74,477	2,50,908	8,20,229	2,247

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	Pulp, Paper & Cardboard (ton/year)	Food (ton/year)	Garden waste (ton/year)	Other Organic Waste (ton/year)	Inorganic, inert waste	Total waste/year	Total waste/day
	6.64%	52.58%	1.11%	9.08%	30.59%		
2036	54,463	4,31,277	9,105	74,477	2,50,908	8,20,229	2,247
2037	54,463	4,31,277	9,105	74,477	2,50,908	8,20,229	2,247

Estimation of Methane Avoidance

Year	Potentially generated Methane	Collected methane due to the efficiency of the gas collection system	Potential emission reduction	Emission reduction due to the efficiency of the gas collection system
	CH <sub>4</sub> /tonnes	CH <sub>4</sub> /tonnes	CO <sub>2</sub> e/tonnes	CO <sub>2</sub> e/tonnes
2020	8,20,229	489.3	244.7	13,701
2021	8,20,229	952.3	476.1	26,664
2022	8,20,229	1,390.4	695.2	38,930
2023	8,20,229	1,804.9	902.5	50,538
2024	8,20,229	2,197.2	1,098.6	61,522
2025	8,20,229	2,568.5	1,284.2	71,918
2026	8,20,229	2,919.9	1,459.9	81,756
2027	8,20,229	3,252.5	1,626.2	91,069
2028	8,20,229	3,567.3	1,783.6	99,884
2029	8,20,229	3,865.3	1,932.6	1,08,228
2030	8,20,229	4,147.4	2,073.7	1,16,127
2031	8,20,229	4,414.5	2,207.2	1,23,606
2032	8,20,229	4,667.4	2,333.7	1,30,686
2033	8,20,229	4,906.8	2,453.4	1,37,391
2034	8,20,229	5,133.5	2,566.8	1,43,739
2035	8,20,229	5,348.2	2,674.1	1,49,751
2036	8,20,229	5,551.6	2,775.8	1,55,444
2037	8,20,229	5,744.1	2,872.1	1,60,836

Estimation of Baseline Emission due of methane avoidance

$$BE_{CH_4} = ((1 - OX_{top\_layer}) \times F_{CH_4,PJ,y} - F_{CH_4,BL,y}) \times GWP_{CH_4} \dots \dots \text{Equation 2, ACM0001 V19}$$

$BE_{CH_4,y}$  = Baseline emissions of methane from the SWDS in year y (t CO<sub>2</sub>e/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)

$F_{CH_4,PJ,y}$  = Amount of methane in the LFG which is flared and/or used in the project activity in year y (t CH<sub>4</sub>/yr)

$F_{CH_4,BL,y}$  = Amount of methane in the LFG that would be flared in the baseline in year y (tCH<sub>4</sub>/yr)

$GWP_{CH_4}$  = Global warming potential of CH<sub>4</sub> (tCO<sub>2</sub>e/tCH<sub>4</sub>)

Since there is no regulation for destroying of methane in landfill gas in the baseline therefore  $F_{CH4,BL,y} = 0$  ..... Equation 6, ACM0001 V19

**Ex ante estimation of  $F_{CH4,PJ,y}$**

$F_{CH4,PJ,y} = \eta_{PJ} \times BE_{CH4,SWDS,y} / GWP_{CH4}$  ..... Equation 5, ACM0001 V19

$BE_{CH4,y}$  = Baseline emissions of methane from the SWDS in year y (t CO<sub>2</sub>e/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 CH<sub>4</sub>/yr)

$F_{CH4,BL,y}$  = Amount of methane in the LFG that would be flared in the baseline in year y (tCH<sub>4</sub>/yr)

$GWP_{CH4}$  = Global warming potential of CH<sub>4</sub> (tCO<sub>2</sub>e/tCH<sub>4</sub>)

Since there is no regulation for destroying of methane in landfill gas in the baseline therefore  $F_{CH4,BL,y} = 0$  ..... Equation 6, ACM0001 V19

	Potential emission avoidance	$F_{CH4,PJ,y}$	$1 - OX_{top\_layer} r$	$(1 - OX_{top\_layer} r) \times F_{CH4,PJ,y}$	$F_{CH4,BL,y}$	$GWP_{CH4}$	$BE_{CH4}$
	tCO <sub>2</sub> e	tCH <sub>4</sub>		tCH <sub>4</sub>	tCH <sub>4</sub>		
29/05/2020-28/05/2021	13,701	244	0.9	220.19	0	28	6,165
29/05/2021-28/05/2022	26,664	476	0.9	428.53	0	28	11,999
29/05/2022-28/05/2023	38,930	695	0.9	625.67	0	28	17,519
29/05/2023-28/05/2024	50,538	902	0.9	812.21	0	28	22,742
29/05/2024-28/05/2025	61,522	1098	0.9	988.75	0	28	27,685
29/05/2025-28/05/2026	71,918	1284	0.9	1155.82	0	28	32,363
29/05/2026-28/05/2027	81,756	1459	0.9	1313.94	0	28	36,790
29/05/2027-28/05/2028	91,069	1626	0.9	1463.61	0	28	40,981
29/05/2028-28/05/2029	99,884	1783	0.9	1605.27	0	28	44,948
29/05/2029-28/05/2030	1,08,228	1932	0.9	1739.38	0	28	48,703

**Estimation of Baseline Emission from Electricity generation (using LFG) and its supply to the grid**

	Capacity of Power Plant	PLF	Annual Generation	Emission Factor	Baseline Emission
	MW	%	MWh	D	F=(C-D)*E
29/05/2020-28/05/2021	15.565	79.91%	108,955	0.57055	62,164
29/05/2021-28/05/2022	15.565	79.91%	108,955	0.57055	62,164
29/05/2022-28/05/2023	15.565	79.91%	108,955	0.57055	62,164
29/05/2023-28/05/2024	15.565	79.91%	108,955	0.57055	62,164
29/05/2024-28/05/2025	15.565	79.91%	108,955	0.57055	62,164

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	Capacity of Power Plant	PLF	Annual Generation	Emission Factor	Baseline Emission
29/05/2025-28/05/2026	15.565	79.91%	108,955	0.57055	62,164
29/05/2026-28/05/2027	15.565	79.91%	108,955	0.57055	62,164
29/05/2027-28/05/2028	15.565	79.91%	108,955	0.57055	62,164
29/05/2028-28/05/2029	15.565	79.91%	108,955	0.57055	62,164
29/05/2029-28/05/2030	15.565	79.91%	108,955	0.57055	62,164

**Baseline Emission from capture and utilization of LFG**

	Baseline Emission (Methane Avoidance LFG)	Baseline Emission (Power Generation)	Baseline Emission
	tCO <sub>2</sub> e	tCO <sub>2</sub> e	tCO <sub>2</sub> e
29/05/2020-28/05/2021	6,165	62,164	68,330
29/05/2021-28/05/2022	11,999	62,164	74,163
29/05/2022-28/05/2023	17,519	62,164	79,683
29/05/2023-28/05/2024	22,742	62,164	84,906
29/05/2024-28/05/2025	27,685	62,164	89,849
29/05/2025-28/05/2026	32,363	62,164	94,527
29/05/2026-28/05/2027	36,790	62,164	98,955
29/05/2027-28/05/2028	40,981	62,164	1,03,145
29/05/2028-28/05/2029	44,948	62,164	1,07,112
29/05/2029-28/05/2030	48,703	62,164	1,10,867

**Project Emission – Capture and utilization of Landfill gas**

	Electricity Consumption (MWh)	Emission Factor of Electricity (tCO <sub>2</sub> /MWh)	Project Emission (tCO <sub>2</sub> )
29/05/2020-28/05/2021	0.00	0.57055	0
29/05/2021-28/05/2022	0.00	0.57055	0
29/05/2022-28/05/2023	0.00	0.57055	0
29/05/2023-28/05/2024	0.00	0.57055	0
29/05/2024-28/05/2025	0.00	0.57055	0
29/05/2025-28/05/2026	0.00	0.57055	0
29/05/2026-28/05/2027	0.00	0.57055	0
29/05/2027-28/05/2028	0.00	0.57055	0
29/05/2028-28/05/2029	0.00	0.57055	0
29/05/2029-28/05/2030	0.00	0.57055	0

**Leakage**

This project doesn't involve transfer of any equipment from another activity therefore the leakage has been considered zero. This project doesn't pertain to the use of Landfill Gas to Energy residues. Therefore, no leakage effects need to be accounted under the ACM0001.

**B.6.4. Summary of ex ante estimates of emission reductions**

**Estimated Emission Reductions**

Year	Baseline emissions (tCO <sub>2</sub> e)	Project emissions (tCO <sub>2</sub> e)	Leakage (tCO <sub>2</sub> e)	Emission reductions (tCO <sub>2</sub> e)
29/05/2020-28/05/2021	68,329	0	0	68,329
29/05/2021-28/05/2022	74,163	0	0	74,163
29/05/2022-28/05/2023	79,682	0	0	79,682
29/05/2023-28/05/2024	84,906	0	0	84,906
29/05/2024-28/05/2025	89,849	0	0	89,849
29/05/2025-28/05/2026	94,527	0	0	94,527
29/05/2026-28/05/2027	98,954	0	0	98,954
29/05/2027-28/05/2028	103,145	0	0	103,145
29/05/2028-28/05/2029	107,111	0	0	107,111
29/05/2029-28/05/2030	110,866	0	0	110,866
<b>Total</b>	<b>911,532</b>	<b>0</b>	<b>0</b>	<b>911,532</b>
<b>Total number of crediting years</b>	<b>10</b>			
<b>Annual average over the crediting period</b>	<b>91,153</b>	<b>0</b>	<b>0</b>	<b>91,153</b>

## B.7. Monitoring plan

### B.7.1. Data and parameters to be monitored

#### Electricity generation and consumption

Data / Parameter Table 1

Data / Parameter:	EG <sub>d,y</sub> (SDG-7)
Methodology reference	ACM0001 (version 19.0)
Data unit	MWh/year
Description	Quantity of electricity generation supplied by the project plant/unit to the grid in year y
Measured/calculated/default	Measured
Data source	Monthly Meter reading protocols (OSOS records)
Value(s) of monitored parameter	Estimated as 108,955 MWh/annum

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Measurement/ Monitoring equipment		<b>Main Meter</b>	<b>Spare Meter</b>
	Type of meter	Electronic Energy Meters	Electronic Energy Meters
	Location of meter	On-site	On-site
	Accuracy of meter	0.5 S	0.5 S
	Serial number of meter	80252547	80252458
	Calibration frequency	Once in ten years	Once in ten years
	Date of Calibration/ validity	To be confirmed during verification	To be confirmed during verification
	Reference No. of Calibration Certificate	To be confirmed during verification	To be confirmed during verification
	Calibration Status	To be confirmed during verification	To be confirmed during verification
Measuring/reading/ recording frequency	Continuous measurement & monthly recording		
Calculation method (if applicable)	Not Applicable (The amount of electricity exported/supplied from the grid by the project activity is measured continuously by electricity meters operated by the Turkish grid company who is the owner of the meter. The amount is reported and invoiced every month by the grid company.)		
QA/QC procedures	Maintenance and calibration of equipment is carried out according to recognized procedures <sup>32</sup> . In accordance with the regulation on metering equipment's, the calibration frequency is set for a 10-year period		
Purpose of data	Estimation of baseline emission		
Additional comments	Data will be archived in paper & electronically for a period of 2 years beyond the end of crediting period or of the last issuance of credits for this project activity, whichever occurs later.		

**Data / Parameter Table 2.**

<b>Data / Parameter:</b>	<b>PE<sub>power,y</sub></b>
Methodology reference	ACM0001 (version 19.0)
Data unit	MWh/annum
Description	Quantity of electricity imported from the grid in year y (consumed by the project plant/unit)
Measured/calculated /default	Measured
Data source	Monthly Meter reading protocols (OSOS records)
Value(s) of monitored parameter	0

<sup>32</sup> In accordance with the Regulation on metering equipment's, the calibration frequency is set for a 10 years period. Reference: <http://www.mevzuat.gov.tr/Metin.Aspx?MevzuatKod=7.5.12316&MevzuatIliski=0&sourceXmlSearch=>

Measurement/ Monitoring equipment		<b>Main Meter</b>	<b>Spare Meter</b>
	Type of meter	Electronic Energy Meters	Electronic Energy Meters
	Location of meter	On-site	On-site
	Accuracy of meter	0.5 S	0.5 S
	Serial number of meter	80252547	80252458
	Calibration frequency	Once in ten years	Once in ten years
	Date of Calibration/ validity	To be confirmed during verification	To be confirmed during verification
	Reference No. of Calibration Certificate	To be confirmed during verification	To be confirmed during verification
	Calibration Status	To be confirmed during verification	To be confirmed during verification
Measuring/reading/ recording frequency	Continuous measurement & monthly recording		
Calculation method (if applicable)	Not Applicable (The amount of electricity imported/drawn from the grid by the project activity is measured continuously by electricity meters operated by the Turkish grid company who is the owner of the meter. The amount is reported and invoiced every month by the grid company).		
QA/QC procedures	Maintenance and calibration of equipment is carried out according to recognized procedures <sup>33</sup> . In accordance with the regulation on metering equipment's, the calibration frequency is set for a 10-year period		
Purpose of data	Estimation of project emission		
Additional comments	Data will be archived in paper & electronically for a period of 2 years beyond the end of crediting period or of the last issuance of credits for this project activity, whichever occurs later.		

**Data / Parameter Table 3.**

<b>Data / Parameter:</b>	<b>TDL<sub>y</sub></b>
Methodology reference	ACM0001 (version 19.0)
Data unit	%
Description	Average technical transmission and distribution losses
Measured/calculated /default	Default
Data source	Recent, accurate and reliable data available within the host country
Value(s) of monitored parameter	14.816% <sup>34</sup>

<sup>33</sup> In accordance with the Regulation on metering equipment's, the calibration frequency is set for a 10 years period. Reference: <http://www.mevzuat.gov.tr/Metin.Aspx?MevzuatKod=7.5.12316&MevzuatIliski=0&sourceXmlSearch=>

<sup>34</sup> <https://data.worldbank.org/indicator/EG.ELC.LOSS.ZS?locations=TR>

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Measurement/ Monitoring equipment		
	Type of meter	Not Applicable
	Location of meter	Not Applicable
	Accuracy of meter	Not Applicable
	Serial number of meter	Not Applicable
	Calibration frequency	Not Applicable
	Date of Calibration/ validity	Not Applicable
	Reference No. of Calibration Certificate	Not Applicable
	Calibration Status	Not Applicable
Measuring/reading/ recording frequency	Annualized Basis	
Calculation method (if applicable)	N/A	
QA/QC procedures	To be obtained from nationally published information	
Purpose of data	Estimating Project emission	
Additional comments	Data will be archived in paper & electronically for a period of 2 years beyond the end of crediting period or of the last issuance of credits for this project activity, whichever occurs later.	

**Landfill Gas Capture and Utilization**

**Data / Parameter Table 4.**

<b>Data / Parameter:</b>	<b>LFG<sub>i,y</sub></b>
Methodology reference	ACM0001 (version 19.0)
Data unit	1,878,160 m <sup>3</sup>
Description	Landfill gas destroyed (Total amount of landfill gas captured at normal temperature and pressure and used for power generation or flared)
Measured/calculated /default	Measured
Data source	Flowmeter
Value(s) of monitored parameter	m <sup>3</sup> (average for the crediting period)



Measurement/ Monitoring equipment	Measurement of total amount of captured landfill gas will be continuously performed by using flow meters and all data will be archived electronically.	
	Type of meter	Flow meter
	Location of meter	Onsite at Booster station
	Accuracy of meter	± 0.075%
	Serial number of meter	3K646612017849
	Calibration frequency	As per the manufacturer the calibration is valid for the lifetime of the meter.
	Date of Calibration/ validity	Not applicable (Same to be confirmed during validation)
	Reference No. of Calibration Certificate	Not Applicable (Same to be confirmed during validation)
Calibration Status	Calibrated (Same to be confirmed during validation)	
Measuring/reading/ recording frequency	The monitoring system works with continuous measurement devices. It is programmed to automatically save half hourly values. The data are stored automatically at the booster stations. The monitored data pertaining to quantum of landfill gas captured will be recorded on a monthly basis.	
Calculation method (if applicable)	N/A	
QA/QC procedures	The flow meters are subject to a regular maintenance and testing regime to ensure accuracy. Records of calibration and maintenance will be archived.	
Purpose of data	Estimation of baseline emission	
Additional comments	Data will be archived in electronic form for two years after the end of crediting period or of the last issuance of credits for this project activity, whichever occurs later.	

**Data / Parameter Table 5.**

<b>Data / Parameter:</b>	<b>T</b>
Methodology reference	ACM0001 (version 19.0)
Data unit	°C
Description	Temperature of the landfill gas
Measured/calculated /default	Measured
Data source	Temperature meters
Value(s) of monitored parameter	30°C

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Measurement/ Monitoring equipment		
	Type of meter	Instruments with recordable electronic signal (digital)
	Location of meter	Booster station
	Accuracy of meter	± 0.1°C
	Serial number of meter	1706-11430
	Calibration frequency	Valid for entire lifetime as per manufacturer's specifications
	Date of Calibration/ validity	Not applicable (Same to be confirmed during validation)
	Reference No. of Calibration Certificate	Not Applicable (Same to be confirmed during validation)
	Calibration Status	Calibrated (Same to be confirmed during validation)
Measuring/reading/ recording frequency	The monitoring system works as continuous measurement devices. It is programmed to automatically save half hourly values. The data are stored automatically. The monitored data will be recorded on a monthly basis.	
Calculation method (if applicable)	N/A	
QA/QC procedures	The temperature meters are subject to a regular maintenance and testing regime to ensure accuracy. Records of calibration and maintenance will be archived.	
Purpose of data	Estimation of baseline emission	
Additional comments	Data will be archived in electronic form for two years after the end of crediting period or of the last issuance of credits for this project activity, whichever occurs later.	

**Data / Parameter Table 6.**

<b>Data / Parameter:</b>	<b>P</b>
Methodology reference	ACM0001 (version 19.0)
Data unit	mbar
Description	Pressure of the landfill gas
Measured/calculated /default	Measured
Data source	Pressure meters
Value(s) of monitored parameter	120 m bar

Measurement/ Monitoring equipment		
	Type of meter	Pressure Meter
	Location of meter	Booster station
	Accuracy of meter	± 0.15%
	Serial number of meter	6410030692
	Calibration frequency	Valid for entire lifetime as per manufacturer's specifications
	Date of Calibration/ validity	Not applicable (Same to be confirmed during validation)
	Reference No. of Calibration Certificate	Not Applicable (Same to be confirmed during validation)
	Calibration Status	Calibrated (Same to be confirmed during validation)
Measuring/reading/ recording frequency	The monitoring system works with continuous measurement devices. It is programmed to automatically save half hourly values. The data are stored automatically. The monitored data will be recorded on a monthly basis.	
Calculation method (if applicable)	N/A	
QA/QC procedures	The pressure meters are subject to a regular maintenance and testing regime to ensure accuracy. Records of calibration and maintenance will be archived.	
Purpose of data	Estimation of baseline emission	
Additional comments	Data will be archived in electronic form for two years after the end of crediting period or of the last issuance of credits for this project activity, whichever occurs later.	

**Data / Parameter Table 7.**

<b>Data / Parameter:</b>	<b>W<sub>CH4</sub></b>
Methodology reference	ACM0001 (version 19.0)
Data unit	% volume basis (m <sup>3</sup> CH <sub>4</sub> / m <sup>3</sup> LFG)
Description	Methane content in landfill gas in the year y
Measured/calculated /default	Measured
Data source	Gas analyzer
Value(s) of monitored parameter	50%

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Measurement/ Monitoring equipment		
	Type of meter	Gas Analyzer
	Location of meter	Booster station
	Accuracy of meter	< ±1%
	Serial number of meter	765611
	Calibration frequency	Valid for entire lifetime as per manufacturer's specifications
	Date of Calibration/ validity	Not applicable (Same to be confirmed during validation)
	Reference No. of Calibration Certificate	Not Applicable (Same to be confirmed during validation)
	Calibration Status	Calibrated (Same to be confirmed during validation)
Measuring/reading/ recording frequency	The monitoring system works with continuous measurement devices. It is programmed to automatically save half hourly values. The data are stored automatically at the booster stations.	
Calculation method (if applicable)	-	
QA/QC procedures	The gas analyzer is subject to a regular maintenance and testing regime to ensure accuracy. Records of calibration and maintenance will be archived.	
Purpose of data	Estimation of baseline emission	
Additional comments	Data will be archived in electronic form for two years after the end of crediting period or of the last issuance of credits for this project activity, whichever occurs later.	

**Data / Parameter Table 8.**

<b>Data / Parameter:</b>	<b>Op<sub>j,h</sub></b>
Methodology reference	ACM0001 (version 19.0)
Data unit	Hrs.
Description	Operation of the equipment that consumes the LFG
Measured/calculated /default	Measured
Data source	Project Owner
Value(s) of monitored parameter	7,000 hours annually

Measurement/ Monitoring equipment		
	Type of meter	SCADA
	Location of meter	On site
	Accuracy of meter	Not applicable
	Serial number of meter	Since SCADA is Software therefore serial number is not applicable
	Calibration frequency	Calibration is not applicable
	Date of Calibration/ validity	Not applicable (Same to be confirmed during validation)
	Reference No. of Calibration Certificate	Not Applicable (Same to be confirmed during validation)
	Calibration Status	Calibrated (Same to be confirmed during validation)
Measuring/reading/ recording frequency	Hourly	
Calculation method (if applicable)	NA	
QA/QC procedures	The run hour meter is subject to a regular maintenance and testing regime to ensure accuracy. Records of calibration and maintenance will be archived.	
Purpose of data	Estimation of baseline emission	
Additional comments	Data will be archived in electronic form for two years after the end of crediting period or of the last issuance of credits for this project activity, whichever occurs later.	

### **Project Emission from Flaring**

#### **Data / Parameter Table 9.**

<b>Data / Parameter:</b>	<b>LFG<sub>flare,y</sub></b>
Methodology reference	ACM0001 (version 19.0)
Data unit	m <sup>3</sup>
Description	Amount of landfill gas flared at normal temperature and pressure
Measured/calculated /default	Measured
Data source	Flow meter reading
Value(s) of monitored parameter	0

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Measurement/ Monitoring equipment	<b>Not Applicable</b>	
	Type of meter	Flow meter
	Location of meter	Before the flaring system
	Accuracy of meter	± 5%
	Serial number of meter	3K646618327911
	Calibration frequency	Valid for entire lifetime as per manufacturer's specifications
	Date of Calibration/ validity	Not applicable (Same to be confirmed during validation)
	Reference No. of Calibration Certificate	Not Applicable (Same to be confirmed during validation)
	Calibration Status	Calibrated (Same to be confirmed during validation)
Measuring/reading/ recording frequency	Measurement of flared amount of captured landfill gas will be continuously performed by using flow meters and all data will be archived electronically.	
Calculation method (if applicable)	NA	
QA/QC procedures	The flow meter(s) are subject to a regular maintenance and testing regime to ensure accuracy. Records of calibration and maintenance will be archived.	
Purpose of data	Measurement of Project emission	
Additional comments	Data will be archived in electronic form for two years after the end of crediting period or of the last issuance of credits for this project activity, whichever occurs later.	

**Data / Parameter Table 10.**

<b>Data / Parameter:</b>	<b>F<sub>CH<sub>4</sub>,m</sub></b>
Methodology reference	ACM0001 (version 19.0)
Data unit	t
Description	Mass flow of methane in the residual gaseous stream in the minute m
Measured/calculated /default	Calculated
Data source	Estimated based on the record of flow meter reading
Value(s) of monitored parameter	1,150 tCH <sub>4</sub> /annum (average of the crediting period)

Measurement/ Monitoring equipment	<b>Not Applicable</b>	
	Type of meter	Not Applicable
	Location of meter	Not Applicable
	Accuracy of meter	Not Applicable
	Serial number of meter	Not Applicable
	Calibration frequency	Not Applicable
	Date of Calibration/ validity	Not Applicable
	Reference No. of Calibration Certificate	Not Applicable
	Calibration Status	Not Applicable
Measuring/reading/ recording frequency	Value will be estimated monthly and cumulated for annualized estimation of emission reduction.	
Calculation method (if applicable)	Calculated based on the monitored value of the flow and estimated value of density.	
QA/QC procedures	NA	
Purpose of data	Estimation of Project emission	
Additional comments	Estimated value will be archived in electronic form for two years after the end of crediting period or of the last issuance of credits for this project activity, whichever occurs later.	

**Data / Parameter Table 11.**

<b>Data / Parameter:</b>	$T_{EG,m}$
Methodology reference	ACM0001 (version 19.0)
Data unit	°C
Description	Temperature in the exhaust gas of the enclosed flare in the minute m
Measured/calculated /default	Measured
Data source	Project owner
Value(s) of monitored parameter	0

Project Submission Form

Measurement/ Monitoring equipment		
	Type of meter	Instruments with recordable electronic signal (digital)
	Location of meter	At exhaust of flaring device
	Accuracy of meter	± 5%
	Serial number of meter	1801-01571
	Calibration frequency	Valid for entire life time as per manufacturer's specifications
	Date of Calibration/ validity	Not applicable (Same to be confirmed during validation)
	Reference No. of Calibration Certificate	Not Applicable (Same to be confirmed during validation)
	Calibration Status	Calibrated (Same to be confirmed during validation)
Measuring/reading/ recording frequency	The monitoring system works as continuous measurement devices. It is programmed to automatically save half hourly values. The data are stored automatically.	
Calculation method (if applicable)	N/A	
QA/QC procedures	The temperature meters are subject to a regular maintenance and testing regime to ensure accuracy. Records of calibration and maintenance will be archived.	
Purpose of data	Estimation of baseline emission	
Additional comments	Data will be archived in electronic form for two years after the end of crediting period or of the last issuance of credits for this project activity, whichever occurs later.	

**Solid Waste Disposal/Landfill**

**Data / Parameter Table 12.**

<b>Data / Parameter:</b>	<b>Management of SWDS</b>
Methodology reference	ACM0001 (version 19.0)
Data unit	-
Description	Management of SWDS
Measured/calculated /default	Measured (Assessed)
Data source	Use different sources of data: (a) Original design of the landfill; (b) Technical specifications for the management of the SWDS;
Value(s) of monitored parameter	No change of baseline



Measurement/ Monitoring equipment		
	Type of meter	Not Applicable
	Location of meter	Not Applicable
	Accuracy of meter	Not Applicable
	Serial number of meter	Not Applicable
	Calibration frequency	Not Applicable
	Date of Calibration/ validity	Not Applicable
	Reference No. of Calibration Certificate	Not Applicable
Calibration Status	Not Applicable	
Measuring/reading/ recording frequency	Annual basis	
Calculation method (if applicable)	Project owner to refer to the original design of the landfill to ensure on whether any practice has been institutionalized to increase methane generation.	
QA/QC procedures	-	
Purpose of data	To estimate baseline and project emission.	
Additional comments	Assessed value will be archived in electronic form for two years after the end of crediting period or of the last issuance of credits for this project activity, whichever occurs later.	

**Data / Parameter Table 13**

<b>Data / Parameter:</b>	$\eta_{HG,PJ,j,y}$
Methodology reference	ACM0001 (version 19.0)
Data unit	Dimensionless
Description	Efficiency of the heat generation equipment used in the project activity in year y
Measured/calculated /default	Manufacturer's information on the efficiency; or default value of 60 per cent
Data source	Manufacturer's information
Value(s) of monitored parameter	Manufacturer's information on the efficiency; or default value of 60 per cent

Project Submission Form

Measurement/ Monitoring equipment		
	Type of meter	Not Applicable
	Location of meter	Not Applicable
	Accuracy of meter	Not Applicable
	Serial number of meter	Not Applicable
	Calibration frequency	Not Applicable
	Date of Calibration/ validity	Not Applicable
	Reference No. of Calibration Certificate	Not Applicable
Calibration Status	Not Applicable	
Measuring/reading/ recording frequency	Annually	
Calculation method (if applicable)	Not Applicable	
QA/QC procedures	Not Applicable	
Purpose of data	For estimating baseline emission	
Additional comments	Assessed value will be archived in electronic form for two years after the end of crediting period or of the last issuance of credits for this project activity, whichever occurs later.	

**Data / Parameter Table 14**

<b>Data / Parameter:</b>	<b>W<sub>x</sub></b>
Methodology reference	ACM0001 (version 19.0)
Data unit	tons
Description	Total amount of waste disposed in a SWDS in year
Measured/calculated /default	Measured
Data source	Weighbridge Record
Value(s) of monitored parameter	820,229

Measurement/ Monitoring equipment		
	Type of meter	Weighbridge
	Location of meter	Before the mechanical sorting system
	Accuracy of meter	<+-1%
	Serial number of meter	535
	Calibration frequency	Valid for entire lifetime as per manufacturer's specifications
	Date of Calibration/ validity	Not applicable (Same to be confirmed during validation)
	Reference No. of Calibration Certificate	Not Applicable (Same to be confirmed during validation)
	Calibration Status	Calibrated (Same to be confirmed during validation)
Measuring/reading/ recording frequency	As and when the Solid waste is transported to SWDS	
Calculation method (if applicable)	Not applicable	
QA/QC procedures	The weighbridge is subject to a regular maintenance and testing regime to ensure accuracy. Records of calibration and maintenance will be archived.	
Purpose of data	Estimation of baseline emission	
Additional comments	Data will be archived in electronic form for two years after the end of crediting period or of the last issuance of credits for this project activity, whichever occurs later.	

### **Sustainable Development Goals**

#### **Data / Parameter Table 16**

<b>Data / Parameter:</b>	<b>SDG 7 - Ensure access to affordable, reliable, sustainable and modern energy for all</b>
Methodology reference	GCC Project Sustainability Standard_V2.1.
Data unit	MWh/yr.
Description	Quantity of electricity generated and supplied by the project plant/unit to the grid in year y (to be used to assess the compliance against indicator 7.2.1 Renewable energy share in the total final energy consumption)
Measured/calculated /default	Measured
Data source	Monthly Meter reading protocols (OSOS records)
Value(s) of monitored parameter	Estimated as 108,955 MWh/annum

Project Submission Form

Measurement/ Monitoring equipment		<b>Main Meter</b>	<b>Spare Meter</b>
	Type of meter	Electronic Energy Meters	Electronic Energy Meters
	Location of meter	On-site	On-site
	Accuracy of meter	0.5 S	0.5 S
	Serial number of meter	80252547	80252458
	Calibration frequency	Once in ten years	Once in ten years
	Date of Calibration/ validity	To be confirmed during verification	To be confirmed during verification
	Reference No. of Calibration Certificate	To be confirmed during verification	To be confirmed during verification
	Calibration Status	To be confirmed during verification	To be confirmed during verification
Measuring/reading/ recording frequency	Continuous measurement & monthly recording		
Calculation method (if applicable)	Not applicable (The electricity exported/supplied to the grid by the project activity is measured continuously by electricity meters operated by the Turkish grid company who is the owner of the meter. The amount is reported and invoiced every month by the grid company.)		
QA/QC procedures	Maintenance and calibration of equipment is carried out according to recognized procedures <sup>35</sup> . In accordance with the regulation on metering equipment's, the calibration frequency is set for a 10-year period.		
Purpose of data	Estimation of baseline emission		
Additional comments	Data will be archived in paper & electronically for a period of 2 years beyond the end of crediting period or of the last issuance of credits for this project activity, whichever occurs later.		

**Data / Parameter Table 17**

<b>Data / Parameter:</b>	<b>Promote sustained, inclusive and sustainable economic growth, full and productive employment and decent work for all (SDG 8)</b>
Methodology reference	GCC Project Sustainability Standard_V2.1.
Data unit	Number
Description	Number of persons employed (Indicator 8.6.1)
Measured/calculated /default	Measured
Data source	SSI Records
Value(s) of monitored parameter	5 numbers of persons employed during the crediting period

<sup>35</sup> In accordance with the Regulation on metering equipment's, the calibration frequency is set for a 10 years period. Reference: <http://www.mevzuat.gov.tr/Metin.Aspx?MevzuatKod=7.5.12316&MevzuatIliski=0&sourceXmlSearch=>

Measurement/ Monitoring equipment	<b>Not Applicable</b>	
	Type of meter	Not Applicable
	Location of meter	Not Applicable
	Accuracy of meter	Not Applicable
	Serial number of meter	Not Applicable
	Calibration frequency	Not Applicable
	Date of Calibration/ validity	Not Applicable
	Reference No. of Calibration Certificate	Not Applicable
	Calibration Status	Not Applicable
Measuring/reading/ recording frequency	Yearly	
Calculation method (if applicable)	Total number of persons employed by sex, age and persons with disabilities will be assessed from the SSI Recordings.	
QA/QC procedures	The number of persons employed is mentioned in the SSI Records, which can be crossed checked with HR Records.	
Purpose of data	To justify SDG 8 Promote sustained, inclusive and sustainable economic growth, full and productive employment and decent work for all.	
Additional comments	Data will be archived in paper & electronically for a period of 2 years beyond the end of crediting period or of the last issuance of credits for this project activity, whichever occurs later.	

**Data / Parameter Table 18**

<b>Data / Parameter:</b>	<b>Build resilient infrastructure, promote inclusive and sustainable industrialization and foster innovation (SDG-9)</b>
Methodology reference	GCC Project Sustainability Standard_V2.1.
Data unit	tCO <sub>2</sub> /annum
Description	Quantum of CO <sub>2</sub> emission avoidance due to supply of clean electricity generated from the LFG based power generation unit to the grid.
Measured/calculated /default	Calculated
Data source	Project Owner based on the actual ER estimated
Value(s) of monitored parameter	62,164 tCO <sub>2</sub> /annum (average)

Project Submission Form

Measurement/ Monitoring equipment	<b>Not Applicable</b>	
	Type of meter	Not Applicable
	Location of meter	Not Applicable
	Accuracy of meter	Not Applicable
	Serial number of meter	Not Applicable
	Calibration frequency	Not Applicable
	Date of Calibration/ validity	Not Applicable
	Reference No. of Calibration Certificate	Not Applicable
	Calibration Status	Not Applicable
Measuring/reading/ recording frequency	Yearly	
Calculation method (if applicable)	Emission avoidance from clean electricity generated and fed to the grid is estimated as a product of electricity generated during the monitoring period and grid emission factor (combined margin grid emission factor).	
QA/QC procedures	N/A	
Purpose of data	To justify SDG 9- Build resilient infrastructure, promote inclusive and sustainable industrialization and foster innovation	
Additional comments	The quantum of clean energy generated and related emission avoidance will result in reduction of emission intensity of the grid power which in turn will result in reduction of CO <sub>2</sub> emission per unit of value added. Data will be archived in paper & electronically for a period of 2 years beyond the end of crediting period or of the last issuance of credits for this project activity, whichever occurs later.	

**Data / Parameter Table 19**

<b>Data / Parameter:</b>	<b>Make cities and human settlements inclusive, safe, resilient and sustainable (SDG 11)</b>
Methodology reference	GCC Project Sustainability Standard_V2.1.
Data unit	Tons of solid waste collected/annum
Description	Proportion of municipal solid waste collected and managed in controlled facilities out of total municipal waste generated, by cities (Indicator 11.6.1)
Measured/calculated /default	Measured
Data source	Project Owner
Value(s) of monitored parameter	2,247 tons of waste/day to the Landfill site (average of the crediting period)

Measurement/ Monitoring equipment	<b>Not Applicable</b>	
	Type of meter	Not Applicable
	Location of meter	Not Applicable
	Accuracy of meter	Not Applicable
	Serial number of meter	Not Applicable
	Calibration frequency	Not Applicable
	Date of Calibration/ validity	Not Applicable
	Reference No. of Calibration Certificate	Not Applicable
	Calibration Status	Not Applicable
Measuring/reading/ recording frequency	Yearly (The quantum of waste to be monitored as an when it reaches the landfill sites and will be estimated on a monthly basis)	
Calculation method (if applicable)	NA	
QA/QC procedures	The weighbridge is subject to a regular maintenance and testing regime to ensure accuracy. Records of calibration and maintenance will be archived.	
Purpose of data	To justify SDG 11- Make cities and human settlements inclusive, safe, resilient and sustainable.	
Additional comments	Data will be archived in electronic form for two years after the end of crediting period or of the last issuance of credits for this project activity, whichever occurs later.	

#### Data / Parameter Table 20

<b>Data / Parameter:</b>	<b>Take urgent action to combat climate change and its impacts (SDG-13)</b>
Methodology reference	GCC Project Sustainability Standard_V2.1.
Data unit	tCO <sub>2</sub> /Year
Description	Total greenhouse gas emissions avoided per year
Measured/calculated /default	Calculated
Data source	Project Owner based on the actual ER estimated
Value(s) of monitored parameter	91,153 tCO <sub>2</sub> /year

Project Submission Form

Measurement/ Monitoring equipment	<b>Not Applicable</b>	
	Type of meter	Not Applicable
	Location of meter	Not Applicable
	Accuracy of meter	Not Applicable
	Serial number of meter	Not Applicable
	Calibration frequency	Not Applicable
	Date of Calibration/ validity	Not Applicable
	Reference No. of Calibration Certificate	Not Applicable
	Calibration Status	Not Applicable
Measuring/reading/ recording frequency	Yearly	
Calculation method (if applicable)	Emission avoidance due to the project activity is estimated in two parts. One part include avoidance of GHG emission due to supply of clean electricity to the grid which is estimated as the product of quantum of electricity generated and supplied to the grid and grid emission factor. The other part includes quantum of LFG captured and utilized.	
QA/QC procedures	NA.	
Purpose of data	To justify SDG 13- Take urgent action to combat climate change and its impacts	
Additional comments	Data will be archived in paper & electronically for a period of 2 years beyond the end of crediting period or of the last issuance of credits for this project activity, whichever occurs later.	

**Monitoring Social Safeguard**

**Data / Parameter Table 21**

<b>Data / Parameter:</b>	<b>Long-term jobs (&gt; 1 year) created</b>
Methodology reference	Environment and Social Safeguards Standard - V2.0
Data unit	Number
Description	Number of Person employed for more than one year
Measured/calculated /default	Calculated
Data source	Project Owner
Value(s) of monitored parameter	1 (across the crediting period)



Measurement/ Monitoring equipment	<b>Not Applicable</b>	
	Type of meter	Not Applicable
	Location of meter	Not Applicable
	Accuracy of meter	Not Applicable
	Serial number of meter	Not Applicable
	Calibration frequency	Not Applicable
	Date of Calibration/ validity	Not Applicable
	Reference No. of Calibration Certificate	Not Applicable
	Calibration Status	Not Applicable
Measuring/reading/ recording frequency	Yearly	
Calculation method (if applicable)	Total number of long-term employments will be calculated from the SSI recordings/company record.	
QA/QC procedures	The number of persons employed is mentioned in the SSI Records, which can be crossed checked with HR Records.	
Purpose of data	To justify social safeguard	
Additional comments	Data will be archived in paper & electronically for a period of 2 years beyond the end of crediting period or of the last issuance of credits for this project activity, whichever occurs later.	

#### Data / Parameter Table 22

<b>Data / Parameter:</b>	<b>Job related training</b>	
Methodology reference	Environment and Social Safeguards Standard - V2.0	
Data unit	Number	
Description	Number of Persons trained on operational and safety protocols	
Measured/calculated /default	Calculated	
Data source	Project Owner	
Value(s) of monitored parameter	1	
Measurement/ Monitoring equipment	<b>Not Applicable</b>	
	Type of meter	Not Applicable
	Location of meter	Not Applicable
	Accuracy of meter	Not Applicable
	Serial number of meter	Not Applicable
	Calibration frequency	Not Applicable
	Date of Calibration/ validity	Not Applicable
	Reference No. of Calibration Certificate	Not Applicable
	Calibration Status	Not Applicable

Project Submission Form

Measuring/reading/recording frequency	Yearly
Calculation method (if applicable)	Total number of persons trained on operational and safety protocols will be calculated from training record.
QA/QC procedures	The number of persons trained on operational and safety protocols (will be checked from training Records.
Purpose of data	To justify social safeguard
Additional comments	Data will be archived in paper & electronically for a period of 2 years beyond the end of crediting period or of the last issuance of credits for this project activity, whichever occurs later.

**Data / Parameter Table 23**

<b>Data / Parameter:</b>	<b>Training on Disease Prevention</b>																			
Methodology reference	Environment and Social Safeguards Standard - V2.0																			
Data unit	Number																			
Description	Number of Persons trained on Disease Prevention																			
Measured/calculated/default	Calculated																			
Data source	Project Owner																			
Value(s) of monitored parameter	1																			
Measurement/Monitoring equipment	<table border="1"> <tr> <th colspan="2"><b>Not Applicable</b></th> </tr> <tr> <td>Type of meter</td> <td>Not Applicable</td> </tr> <tr> <td>Location of meter</td> <td>Not Applicable</td> </tr> <tr> <td>Accuracy of meter</td> <td>Not Applicable</td> </tr> <tr> <td>Serial number of meter</td> <td>Not Applicable</td> </tr> <tr> <td>Calibration frequency</td> <td>Not Applicable</td> </tr> <tr> <td>Date of Calibration/validity</td> <td>Not Applicable</td> </tr> <tr> <td>Reference No. of Calibration Certificate</td> <td>Not Applicable</td> </tr> <tr> <td>Calibration Status</td> <td>Not Applicable</td> </tr> </table>		<b>Not Applicable</b>		Type of meter	Not Applicable	Location of meter	Not Applicable	Accuracy of meter	Not Applicable	Serial number of meter	Not Applicable	Calibration frequency	Not Applicable	Date of Calibration/validity	Not Applicable	Reference No. of Calibration Certificate	Not Applicable	Calibration Status	Not Applicable
<b>Not Applicable</b>																				
Type of meter	Not Applicable																			
Location of meter	Not Applicable																			
Accuracy of meter	Not Applicable																			
Serial number of meter	Not Applicable																			
Calibration frequency	Not Applicable																			
Date of Calibration/validity	Not Applicable																			
Reference No. of Calibration Certificate	Not Applicable																			
Calibration Status	Not Applicable																			
Measuring/reading/recording frequency	Yearly																			
Calculation method (if applicable)	Total number of persons trained on Disease Prevention will be calculated from training record.																			
QA/QC procedures	The number of persons trained on Disease Prevention will be checked from training Records.																			
Purpose of data	To justify social safeguard																			
Additional comments	Data will be archived in paper & electronically for a period of 2 years beyond the end of crediting period or of the last issuance of credits for this project activity, whichever occurs later.																			

**Data / Parameter Table 24**

<b>Data / Parameter:</b>	<b>Training towards reducing accidents</b>	
Methodology reference	Environment and Social Safeguards Standard - V2.0	
Data unit	Number	
Description	Number of Persons trained on reducing accidents	
Measured/calculated /default	Calculated	
Data source	Project Owner	
Value(s) of monitored parameter	1	
Measurement/ Monitoring equipment	<b>Not Applicable</b>	
	Type of meter	Not Applicable
	Location of meter	Not Applicable
	Accuracy of meter	Not Applicable
	Serial number of meter	Not Applicable
	Calibration frequency	Not Applicable
	Date of Calibration/ validity	Not Applicable
	Reference No. of Calibration Certificate	Not Applicable
	Calibration Status	Not Applicable
Measuring/reading/ recording frequency	Yearly	
Calculation method (if applicable)	Total number of persons trained towards reducing accidents will be calculated from training record.	
QA/QC procedures	The number of persons trained towards reducing accidents will be checked from training Records.	
Purpose of data	To justify social safeguard	
Additional comments	Data will be archived in paper & electronically for a period of 2 years beyond the end of crediting period or of the last issuance of credits for this project activity, whichever occurs later.	

**Data / Parameter Table 25**

<b>Data / Parameter:</b>	<b>Training towards reducing fire/explosion and risk to human life</b>	
Methodology reference	Environment and Social Safeguards Standard - V2.0	
Data unit	Number	
Description	Number of Persons trained towards reducing fire/explosion and risk to human life	
Measured/calculated /default	Calculated	
Data source	Project Owner	

Project Submission Form

Value(s) of monitored parameter	1																		
Measurement/ Monitoring equipment	<table border="1"> <tr> <td colspan="2"><b>Not Applicable</b></td> </tr> <tr> <td>Type of meter</td> <td>Not Applicable</td> </tr> <tr> <td>Location of meter</td> <td>Not Applicable</td> </tr> <tr> <td>Accuracy of meter</td> <td>Not Applicable</td> </tr> <tr> <td>Serial number of meter</td> <td>Not Applicable</td> </tr> <tr> <td>Calibration frequency</td> <td>Not Applicable</td> </tr> <tr> <td>Date of Calibration/ validity</td> <td>Not Applicable</td> </tr> <tr> <td>Reference No. of Calibration Certificate</td> <td>Not Applicable</td> </tr> <tr> <td>Calibration Status</td> <td>Not Applicable</td> </tr> </table>	<b>Not Applicable</b>		Type of meter	Not Applicable	Location of meter	Not Applicable	Accuracy of meter	Not Applicable	Serial number of meter	Not Applicable	Calibration frequency	Not Applicable	Date of Calibration/ validity	Not Applicable	Reference No. of Calibration Certificate	Not Applicable	Calibration Status	Not Applicable
<b>Not Applicable</b>																			
Type of meter	Not Applicable																		
Location of meter	Not Applicable																		
Accuracy of meter	Not Applicable																		
Serial number of meter	Not Applicable																		
Calibration frequency	Not Applicable																		
Date of Calibration/ validity	Not Applicable																		
Reference No. of Calibration Certificate	Not Applicable																		
Calibration Status	Not Applicable																		
Measuring/reading/ recording frequency	Yearly																		
Calculation method (if applicable)	Total number of persons trained towards reducing fire/explosion and risk to human life will be checked from training Records.																		
QA/QC procedures	towards reducing fire/explosion and risk to human life will be checked from training Records.																		
Purpose of data	To justify social safeguard																		
Additional comments	Data will be archived in paper & electronically for a period of 2 years beyond the end of crediting period or of the last issuance of credits for this project activity, whichever occurs later.																		

**Monitoring Environmental Safeguard**

**Data / Parameter Table 26**

<b>Data / Parameter:</b>	<b>Methane emissions</b>
Methodology reference	Environment and Social Safeguards Standard - V2.0
Data unit	m <sup>3</sup> of CH <sub>4</sub> /annum
Description	Quantum of methane emission captured for utilization
Measured/calculated /default	Measured
Data source	Project Owner
Value(s) of monitored parameter	1,607,430 m <sup>3</sup> of CH <sub>4</sub> /annum

Measurement/ Monitoring equipment	<b>Not Applicable</b>	
	Type of meter	Flow meter
	Location of meter	Before the flow meter
	Accuracy of meter	± 5%
	Serial number of meter	3K646618327910
	Calibration frequency	Valid for entire life time as per manufacturer's specifications
	Date of Calibration/ validity	Not applicable (Same to be confirmed during validation)
	Reference No. of Calibration Certificate	Not Applicable (Same to be confirmed during validation)
	Calibration Status	Calibrated (Same to be confirmed during validation)
Measuring/reading/ recording frequency	The monitoring system works with continuous measurement devices. It is programmed to automatically save half hourly values. The recorded data of LFG capture will be recorded on monthly basis. The data are stored automatically at the booster stations.	
Calculation method (if applicable)	Monitored data on the quantum of land fill gas captured and utilized will be multiplied with methane content of landfill gas to estimate the quantum of methane emission avoided	
QA/QC procedures	The flow meters are subject to a regular maintenance and testing regime to ensure accuracy. Records of calibration and maintenance will be archived.	
Purpose of data	Estimation of environmental safeguard.	
Additional comments	Data will be archived in electronic form for two years after the end of crediting period or of the last issuance of credits for this project activity, whichever occurs later.	

**Data / Parameter Table 27**

<b>Data / Parameter:</b>	<b>CO<sub>2</sub> Emission</b>
Methodology reference	Environment and Social Safeguards Standard - V2.0
Data unit	tCO <sub>2</sub> /Year
Description	Clean electricity generated from the LFG based power generation unit to result in reduction of CO <sub>2</sub> emission by avoiding electricity generated in the grid connected power plant and equivalent CO <sub>2</sub> emission avoidance from capture and utilization of methane (LFG).
Measured/calculated /default	Calculated
Data source	Project Owner
Value(s) of monitored parameter	91,153 tCO <sub>2</sub> /year

Project Submission Form

Measurement/ Monitoring equipment	<b>Not Applicable</b>	
	Type of meter	Not Applicable
	Location of meter	Not Applicable
	Accuracy of meter	Not Applicable
	Serial number of meter	Not Applicable
	Calibration frequency	Not Applicable
	Date of Calibration/ validity	Not Applicable
	Reference No. of Calibration Certificate	Not Applicable
	Calibration Status	Not Applicable
Measuring/reading/ recording frequency	Yearly	
Calculation method (if applicable)	Emission avoidance due to the project activity is estimated as product of quantum of electricity generated and grid emission factor and quantum of methane capture and utilized for power generation.	
QA/QC procedures	Reduced quantum of Greenhouse gases emitted to the atmosphere is estimated based on the product of monitored quantum of electricity generated.	
Purpose of data	Estimation of environmental safeguard	
Additional comments	Data will be archived in paper & electronically for a period of 2 years beyond the end of crediting period or of the last issuance of credits for this project activity, whichever occurs later.	

**Data / Parameter Table 28**

<b>Data / Parameter:</b>	<b>Replacing fossil fuels with renewable sources of energy</b>		
Methodology reference	Environment and Social Safeguards Standard - V2.0		
Data unit	MWh		
Description	Quantity of net electricity generation supplied by the project plant/unit to the grid in year y		
Measured/calculated /default	Measured		
Data source	Monthly Meter reading protocols (OSOS records)		
Value(s) of monitored parameter	108,955 MWh/annum		
Measurement/ Monitoring equipment		<b>Main Meter</b>	<b>Spare Meter</b>
	Type of meter	Electronic Energy Meters	Electronic Energy Meters
	Location of meter	On-site	On-site
	Accuracy of meter	0.5 S	0.5 S
	Serial number of meter	80252547	80252458
	Calibration frequency	Once in ten years	Once in ten years
	Date of Calibration/ validity	To be confirmed during verification	To be confirmed during verification

	Reference No. of Calibration Certificate	To be confirmed during verification	To be confirmed during verification
	Calibration Status	To be confirmed during verification	To be confirmed during verification
Measuring/reading/recording frequency	Continuous measurement & monthly recording		
Calculation method (if applicable)	Not applicable (The electricity exported/supplied to the grid by the project activity is measured continuously by electricity meters operated by the Turkish grid company who is the owner of the meter.		
QA/QC procedures	The amount of electricity generated and supplied to the grid is reported and invoiced every month by the grid company.)		
Purpose of data	Estimation of environmental safeguard		
Additional comments	Data will be archived in paper & electronically for a period of 2 years beyond the end of crediting period or of the last issuance of credits for this project activity, whichever occurs later.		

**Data / Parameter Table 29**

<b>Data / Parameter:</b>	<b>Solid waste Pollution from end-of-life products/ equipment and from machinery overhaul</b>	
Methodology reference	Environment and Social Safeguards Standard - V2.0	
Data unit	Tons	
Description	Generation of solid waste either at end of product life or due to overhaul of blower, compressor system, gas engines and internals.	
Measured/calculated/default	Measured	
Data source	Project owner	
Value(s) of monitored parameter	N/A	
Measurement/ Monitoring equipment	<b>Not Applicable</b>	
	Type of meter	Not Applicable
	Location of meter	Not Applicable
	Accuracy of meter	Not Applicable
	Serial number of meter	Not Applicable
	Calibration frequency	Not Applicable
	Date of Calibration/ validity	Not Applicable
	Reference No. of Calibration Certificate	Not Applicable
	Calibration Status	Not Applicable
Measuring/reading/recording frequency	Monitored as and when generated & monthly recording	

Project Submission Form

Calculation method (if applicable)	Not Applicable
QA/QC procedures	The quantum of waste generated will be weighed and depending upon the materials will either be landfilled or disposed.
Purpose of data	Assessment of environmental safeguard
Additional comments	Data will be archived in paper & electronically for a period of 2 years beyond the end of crediting period or of the last issuance of credits for this project activity, whichever occurs later.

**Data / Parameter Table 30**

<b>Data / Parameter:</b>	<b>Pollution from waste oil</b>	
Methodology reference	Environment and Social Safeguards Standard - V2.0	
Data unit	Tons	
Description	Release of waste oils/ spilled oil/ lubricants from plant operation that is considered as hazardous.	
Measured/calculated /default	Measured	
Data source	Project owner	
Value(s) of monitored parameter	N/A	
Measurement/ Monitoring equipment	<b>Not Applicable</b>	
	Type of meter	Not Applicable
	Location of meter	Not Applicable
	Accuracy of meter	Not Applicable
	Serial number of meter	Not Applicable
	Calibration frequency	Not Applicable
	Date of Calibration/ validity	Not Applicable
	Reference No. of Calibration Certificate	Not Applicable
	Calibration Status	Not Applicable
Measuring/reading/ recording frequency	The waste oil/ spilled oil/ lubricants will be continuously collected and recorded on monthly basis.	
Calculation method (if applicable)	Not Applicable	
QA/QC procedures	The quantum of waste oils/ lubricants from plant operation will be collected, weighed and hand overed to appropriate agency for recycle.	
Purpose of data	Assessment of environmental safeguard	
Additional comments	Data will be archived in paper & electronically for a period of 2 years beyond the end of crediting period or of the last issuance of credits for this project activity, whichever occurs later.	



## B.7.2 Monitoring-program of risk management actions

<b>Data / Parameter:</b>	<b>Noise due to operation of Gas Turbine</b>																					
Objective of the Program of Risk Management Actions	<b>Program of Risk Management Actions for Noise from operation of Gas Turbine (PRMA 01)</b>																					
Purpose:	<i>To monitor environmental impact identified as not harmful in the risk assessment and to develop a program of risk management actions plan to address the risk of PRMA 01.</i>																					
Describe the environment /social impact risk that needs to be mitigated.	Gas turbines produce noise when operating primarily from mechanical sources. Mechanical noise may be generated by machinery.																					
Describe the actions and targets that will be implemented to ensure that the Project Activity will avoid negative impacts that cause harm.	The noise due to operation of gas turbine are within permissible limit and moreover Turbines are located in remote area (land fill site) and is in distance from urban or industrial area. The project owner will ensure to check the noise level once in a year to ensure that the noise is within the permissible limit.																					
Program of Risk Management Actions to achieve the target(s):	<table border="1"> <thead> <tr> <th>S.No.</th> <th>Action and targets</th> <th>Responsibility</th> <th>Resource Requirement</th> <th>Target to be Achieved by (insert date)</th> <th>Key Performance Indicators (KPI)</th> <th>Targets achieved on (insert date)</th> </tr> </thead> <tbody> <tr> <td>1</td> <td>Monitoring of noise level</td> <td>Project Owner</td> <td>01</td> <td>29/05/2020</td> <td>Noise level assessed</td> <td>29/05/2020</td> </tr> <tr> <td colspan="3">Date of Closing the Program:</td> <td colspan="2">28/05/2030</td> <td colspan="2"></td> </tr> </tbody> </table> <p>The noise level will be monitored each year during the crediting period and will be submitted for verification</p>	S.No.	Action and targets	Responsibility	Resource Requirement	Target to be Achieved by (insert date)	Key Performance Indicators (KPI)	Targets achieved on (insert date)	1	Monitoring of noise level	Project Owner	01	29/05/2020	Noise level assessed	29/05/2020	Date of Closing the Program:			28/05/2030			
S.No.	Action and targets	Responsibility	Resource Requirement	Target to be Achieved by (insert date)	Key Performance Indicators (KPI)	Targets achieved on (insert date)																
1	Monitoring of noise level	Project Owner	01	29/05/2020	Noise level assessed	29/05/2020																
Date of Closing the Program:			28/05/2030																			
QA/QC procedures:	Record will be maintained and submitted during verification.																					
Describe whether the Project Activity has achieved the targets set out in this Program of Risk Management Actions. If yes, describe the outcome(s).	To be monitored by third party agency.																					

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<b>Data / Parameter:</b>	<b>SO<sub>x</sub> emission due to combustion of LFG in Gas Turbine</b>																																																								
Objective of the Program of Risk Management Actions	<b>Program of Risk Management Actions for SO<sub>x</sub> emission due to combustion of LFG in Gas Turbine (PRMA 02)</b>																																																								
Purpose:	<i>To monitor environmental impact identified as not harmful in the risk assessment and to develop a program of risk management actions plan to address the risk of PRMA 02 if the emitted SO<sub>x</sub> is beyond permissible limit.</i>																																																								
Describe the environment /social impact risk that needs to be mitigated.	Probability of SO <sub>x</sub> emission from combustion of the LFG in gas turbine is negligible and within permissible limits as LFG is treated prior to its utilization in gas turbine.																																																								
Describe the actions and targets that will be implemented to ensure that the Project Activity will avoid negative impacts that cause harm.	The emission of SO <sub>x</sub> under the project activity is negligible and within permissible limit. The project owner will ensure to monitor SO <sub>x</sub> emission in the exhaust once in a year to ensure that the emission is within the permissible limit.																																																								
Program of Risk Management Actions to achieve the target(s):	<table border="1"> <thead> <tr> <th>S.No.</th> <th>Action and targets</th> <th>Responsibility</th> <th>Resource Requirement</th> <th>Target to be Achieved by (insert date)</th> <th>Key Performance Indicators (KPI)</th> <th>Targets achieved on (insert date)</th> </tr> </thead> <tbody> <tr> <td>1</td> <td>Monitoring of SO<sub>x</sub> level</td> <td>Project Owner</td> <td>01</td> <td>29/05/2020</td> <td>SO<sub>x</sub> level assessment on an annual basis</td> <td>29/05/2020</td> </tr> <tr> <td>2</td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> </tr> <tr> <td>3</td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> </tr> <tr> <td>4</td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> </tr> <tr> <td>5</td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> </tr> <tr> <td>6</td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> </tr> <tr> <td colspan="3">Date of Closing the Program:</td> <td colspan="2">28/05/2030</td> <td colspan="2"></td> </tr> </tbody> </table> <p>The SO<sub>x</sub> level will be monitored each year during the crediting period and will be submitted for verification. In case the emitted SO<sub>x</sub> is beyond permissible limit, O&amp;M agency will be contacted for its resolution.</p>	S.No.	Action and targets	Responsibility	Resource Requirement	Target to be Achieved by (insert date)	Key Performance Indicators (KPI)	Targets achieved on (insert date)	1	Monitoring of SO <sub>x</sub> level	Project Owner	01	29/05/2020	SO <sub>x</sub> level assessment on an annual basis	29/05/2020	2							3							4							5							6							Date of Closing the Program:			28/05/2030			
S.No.	Action and targets	Responsibility	Resource Requirement	Target to be Achieved by (insert date)	Key Performance Indicators (KPI)	Targets achieved on (insert date)																																																			
1	Monitoring of SO <sub>x</sub> level	Project Owner	01	29/05/2020	SO <sub>x</sub> level assessment on an annual basis	29/05/2020																																																			
2																																																									
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Date of Closing the Program:			28/05/2030																																																						
QA/QC procedures:	Record will be maintained and summited during verification.																																																								
Describe whether the Project Activity has achieved the targets set out in this Program of Risk Management Actions. If yes, describe the outcome(s).	To be monitored by third party agency.																																																								

<b>Data / Parameter:</b>	<b>NO<sub>x</sub> emission due to combustion of LFG in Gas Turbine</b>																																																								
Objective of the Program of Risk Management Actions	<b>Program of Risk Management Actions for NO<sub>x</sub> emission due to combustion of LFG in Gas Turbine (PRMA 03)</b>																																																								
Purpose:	To monitor environmental impact identified as not harmful in the risk assessment and to develop a program of risk management actions plan to address the risk of PRMA 03 if the emitted NO <sub>x</sub> is beyond permissible limit.																																																								
Describe the environment /social impact risk that needs to be mitigated.	Probability of NO <sub>x</sub> emission from combustion of the LFG in gas turbine is negligible and is within permissible limits.																																																								
Describe the actions and targets that will be implemented to ensure that the Project Activity will avoid negative impacts that cause harm.	<i>The emission of NO<sub>x</sub> under the project activity is negligible and within permissible limit. The project owner will ensure to monitor NO<sub>x</sub> emission in the exhaust once in a year to ensure that the emission is within the permissible limit.</i>																																																								
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S.No.	Action and targets	Responsibility	Resource Requirement	Target to be Achieved by (insert date)	Key Performance Indicators (KPI)	Targets achieved on (insert date)																																																			
1	Monitoring of NO <sub>x</sub> level	Project Owner	01	29/05/2020	NO <sub>x</sub> level assessment on an annual basis	29/05/2020																																																			
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Describe whether the Project Activity has achieved the targets set out in this Program of Risk Management Actions. If yes, describe the outcome(s).	To be monitored by third party agency.																																																								

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<b>Data / Parameter:</b>	<b>CO (Carbon Monoxide) emission due to combustion of LFG in Gas Turbine</b>																																																								
Objective of the Program of Risk Management Actions	Program of Risk Management Actions for CO emission due to combustion of LFG in Gas Turbine (PRMA 04)																																																								
Purpose:	To monitor environmental impact identified as not harmful in the risk assessment and to develop a program of risk management actions plan to address the risk of PRMA 04 if the emitted CO is beyond permissible limit.																																																								
Describe the environment /social impact risk that needs to be mitigated.	Emission of CO emission from combustion of the LFG in gas turbine is negligible and is within permissible limits.																																																								
Describe the actions and targets that will be implemented to ensure that the Project Activity will avoid negative impacts that cause harm.	The emission of CO under the project activity is negligible and within permissible limit. The project owner will ensure to monitor CO emission in the exhaust once in a year to ensure that the emission is within the permissible limit.																																																								
Program of Risk Management Actions to achieve the target(s):	<table border="1"> <thead> <tr> <th>S.No.</th> <th>Action and targets</th> <th>Responsibility</th> <th>Resource Requirement</th> <th>Target to be Achieved by (insert date)</th> <th>Key Performance Indicators (KPI)</th> <th>Targets achieved on (insert date)</th> </tr> </thead> <tbody> <tr> <td>1</td> <td>Monitoring of CO level</td> <td>Project Owner</td> <td>01</td> <td>29/05/2020</td> <td>CO level assessment on an annual basis</td> <td>29/05/2020</td> </tr> <tr> <td>2</td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> </tr> <tr> <td>3</td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> </tr> <tr> <td>4</td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> </tr> <tr> <td>5</td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> </tr> <tr> <td>6</td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> </tr> <tr> <td colspan="3">Date of Closing the Program:</td> <td colspan="2">28/05/2030</td> <td colspan="2"></td> </tr> </tbody> </table> <p>The CO level will be monitored each year during the crediting period and will be submitted for verification. In case the emitted CO is beyond permissible limit, O&amp;M agency will be contacted for its resolution.</p>	S.No.	Action and targets	Responsibility	Resource Requirement	Target to be Achieved by (insert date)	Key Performance Indicators (KPI)	Targets achieved on (insert date)	1	Monitoring of CO level	Project Owner	01	29/05/2020	CO level assessment on an annual basis	29/05/2020	2							3							4							5							6							Date of Closing the Program:			28/05/2030			
S.No.	Action and targets	Responsibility	Resource Requirement	Target to be Achieved by (insert date)	Key Performance Indicators (KPI)	Targets achieved on (insert date)																																																			
1	Monitoring of CO level	Project Owner	01	29/05/2020	CO level assessment on an annual basis	29/05/2020																																																			
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QA/QC procedures:	Record will be maintained and summited during verification.																																																								
Describe whether the Project Activity has achieved the targets set out in this Program of Risk Management Actions. If yes, describe the outcome(s).	To be monitored by third party agency.																																																								

<b>Data / Parameter:</b>	<b>Emission of PM (Particulate matter) due to combustion of LFG in Gas Turbine</b>																																																								
Objective of the Program of Risk Management Actions	Program of Risk Management Actions for PM emission due to combustion of LFG in Gas Turbine (PRMA 05) if the emitted PM is beyond permissible limit.																																																								
Purpose:	To monitor environmental impact identified as not harmful in the risk assessment and to develop a program of risk management actions plan to address the risk of PRMA 05.																																																								
Describe the environment /social impact risk that needs to be mitigated.	Emission of PM emission from combustion of the LFG in gas turbine is negligible and is within permissible limits.																																																								
Describe the actions and targets that will be implemented to ensure that the Project Activity will avoid negative impacts that cause harm.	The emission of PM under the project activity is negligible and within permissible limit. The project owner will ensure to monitor PM emission in the exhaust once in a year to ensure that the emission is within the permissible limit.																																																								
Program of Risk Management Actions to achieve the target(s):	<table border="1"> <thead> <tr> <th>S.No.</th> <th>Action and targets</th> <th>Responsibility</th> <th>Resource Requirement</th> <th>Target to be Achieved by (insert date)</th> <th>Key Performance Indicators (KPI)</th> <th>Targets achieved on (insert date)</th> </tr> </thead> <tbody> <tr> <td>1</td> <td>Monitoring of PM level</td> <td>Project Owner</td> <td>01</td> <td>29/05/2020</td> <td>PM level assessment on an annual basis</td> <td>29/05/2020</td> </tr> <tr> <td>2</td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> </tr> <tr> <td>3</td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> </tr> <tr> <td>4</td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> </tr> <tr> <td>5</td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> </tr> <tr> <td>6</td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> </tr> <tr> <td colspan="3">Date of Closing the Program:</td> <td colspan="2">28/05/2030</td> <td colspan="2"></td> </tr> </tbody> </table> <p>The PM level will be monitored each year during the crediting period and will be submitted for verification. In case the emitted PM level is beyond permissible limit , O&amp;M agency will be contacted for its resolution.</p>	S.No.	Action and targets	Responsibility	Resource Requirement	Target to be Achieved by (insert date)	Key Performance Indicators (KPI)	Targets achieved on (insert date)	1	Monitoring of PM level	Project Owner	01	29/05/2020	PM level assessment on an annual basis	29/05/2020	2							3							4							5							6							Date of Closing the Program:			28/05/2030			
S.No.	Action and targets	Responsibility	Resource Requirement	Target to be Achieved by (insert date)	Key Performance Indicators (KPI)	Targets achieved on (insert date)																																																			
1	Monitoring of PM level	Project Owner	01	29/05/2020	PM level assessment on an annual basis	29/05/2020																																																			
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QA/QC procedures:	Record will be maintained and summited during verification.																																																								
Describe whether the Project Activity has achieved the targets set out in this Program of Risk Management Actions. If yes, describe the outcome(s).	To be monitored by third party agency.																																																								

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<b>Data / Parameter:</b>	<b>Quantum of methane leakage in the LFG capture and transmission network.</b>																																																								
Objective of the Program of Risk Management Actions	Program of Risk Management Actions for arresting the leakage of methane in the LFG capture and transmission network (PRMA 06)																																																								
Purpose:	To monitor environmental impact identified as not harmful in the risk assessment and to develop a program of risk management actions plan to address the risk of PRMA 06.																																																								
Describe the environment /social impact risk that needs to be mitigated.	Leakage of methane (LFG) from the LFG collection and transmission network.																																																								
Describe the actions and targets that will be implemented to ensure that the Project Activity will avoid negative impacts that cause harm.	The leakage of methane under the project activity is negligible as the leakage if any is immediately arrested as part of fire safety protocol. The project owner will ensure to monitor leakage emission once the leak is detected by the gas sensor. The leakage in the network will be identified using thermographic imager.																																																								
Program of Risk Management Actions to achieve the target(s):	<table border="1"> <thead> <tr> <th>S.No.</th> <th>Action and targets</th> <th>Responsibility</th> <th>Resource Requirement</th> <th>Target to be Achieved by (insert date)</th> <th>Key Performance Indicators (KPI)</th> <th>Targets achieved on (insert date)</th> </tr> </thead> <tbody> <tr> <td>1</td> <td>Monitoring of methane leakage</td> <td>Project Owner</td> <td>01</td> <td>29/05/2020</td> <td>Assessment of LFG leakage on an annual basis</td> <td>29/05/2020</td> </tr> <tr> <td>2</td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> </tr> <tr> <td>3</td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> </tr> <tr> <td>4</td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> </tr> <tr> <td>5</td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> </tr> <tr> <td>6</td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> </tr> <tr> <td colspan="3">Date of Closing the Program:</td> <td>28/05/2030</td> <td></td> <td></td> <td></td> </tr> </tbody> </table> <p>The instances of leakage of LFG if any and the remedial measures undertaken will be recorded and during the crediting period and will be submitted for verification</p>	S.No.	Action and targets	Responsibility	Resource Requirement	Target to be Achieved by (insert date)	Key Performance Indicators (KPI)	Targets achieved on (insert date)	1	Monitoring of methane leakage	Project Owner	01	29/05/2020	Assessment of LFG leakage on an annual basis	29/05/2020	2							3							4							5							6							Date of Closing the Program:			28/05/2030			
S.No.	Action and targets	Responsibility	Resource Requirement	Target to be Achieved by (insert date)	Key Performance Indicators (KPI)	Targets achieved on (insert date)																																																			
1	Monitoring of methane leakage	Project Owner	01	29/05/2020	Assessment of LFG leakage on an annual basis	29/05/2020																																																			
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Date of Closing the Program:			28/05/2030																																																						
QA/QC procedures:	Record will be maintained and summited during verification.																																																								
Describe whether the Project Activity has achieved the targets set out in this Program of Risk Management Actions. If yes, describe the outcome(s).	The project owner as part of the safety protocols includes gas sensors at the booster stations. Once the gas sensors detect leakage, thermographic imager is used to identify the leak point and arrest the leakage.																																																								

<b>Data / Parameter:</b>	<b>Quantum of waste oil/spilled oil/lubricant released from the gas based generation system.</b>																					
Objective of the Program of Risk Management Actions	Program of Risk Management Actions for arresting and recycling the waste oil/spilled oil/lubricant released (PRMA 07)																					
Purpose:	To monitor environmental impact identified as not harmful in the risk assessment and to develop a program of risk management actions plan to address the risk of PRMA 07.																					
Describe the environment /social impact risk that needs to be mitigated.	Release of waste oil/spilled oil/lubricant from the gas-based generation system																					
Describe the actions and targets that will be implemented to ensure that the Project Activity will avoid negative impacts that cause harm.	The release of waste oil/ spilled oil/ lubricant in the area of gas turbine is negligible. The project owner will collect the waste oil/ spilled oil/ lubricant and will hand over to appropriate agency for recycling.																					
Program of Risk Management Actions to achieve the target(s):	<table border="1"> <thead> <tr> <th>S.No.</th> <th>Action and targets</th> <th>Responsibility</th> <th>Resource Requirement</th> <th>Target to be Achieved by (insert date)</th> <th>Key Performance Indicators (KPI)</th> <th>Targets achieved on (insert date)</th> </tr> </thead> <tbody> <tr> <td>1</td> <td>Monitoring of release of waste oil/ spilled oil/ lubricant</td> <td>Project Owner</td> <td>01</td> <td>29/05/2020</td> <td>Quantum of waste oil/ spilled oil/ lubricant released is assessed on an annual basis</td> <td>29/05/2020</td> </tr> <tr> <td colspan="3">Date of Closing the Program:</td> <td>28/05/2030</td> <td></td> <td></td> <td></td> </tr> </tbody> </table> <p>The Quantum of waste oil/ spilled oil/ lubricant will be continuously collected and recorded on monthly basis. The record will be submitted for verification</p>	S.No.	Action and targets	Responsibility	Resource Requirement	Target to be Achieved by (insert date)	Key Performance Indicators (KPI)	Targets achieved on (insert date)	1	Monitoring of release of waste oil/ spilled oil/ lubricant	Project Owner	01	29/05/2020	Quantum of waste oil/ spilled oil/ lubricant released is assessed on an annual basis	29/05/2020	Date of Closing the Program:			28/05/2030			
S.No.	Action and targets	Responsibility	Resource Requirement	Target to be Achieved by (insert date)	Key Performance Indicators (KPI)	Targets achieved on (insert date)																
1	Monitoring of release of waste oil/ spilled oil/ lubricant	Project Owner	01	29/05/2020	Quantum of waste oil/ spilled oil/ lubricant released is assessed on an annual basis	29/05/2020																
Date of Closing the Program:			28/05/2030																			
QA/QC procedures:	Record will be maintained and summited during verification.																					
Describe whether the Project Activity has achieved the targets set out in this Program of Risk Management Actions. If yes, describe the outcome(s).	The waste oil/spilled oil/lubricant will be collected and hand overed to the agency for purpose of recycling.																					

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<b>Data / Parameter:</b>	<b>Quantum of solid waste generated due to overhaul of blower, compressor system, gas engines and internals and at the end of the product life time</b>																
Objective of the Program of Risk Management Actions	Program of Risk Management Actions for managing the solid waste generated due to overhaul of blower, compressor system, gas engines and internals and at the end of the product lifetime (PRMA 08)																
Purpose:	To monitor environmental impact identified as not harmful in the risk assessment and to develop a program of risk management actions plan to address the risk of PRMA 08.																
Describe the environment /social impact risk that needs to be mitigated.	Generation of solid waste generated due to overhaul of blower, compressor system, gas engines and internals and at the end of the product life time																
Describe the actions and targets that will be implemented to ensure that the Project Activity will avoid negative impacts that cause harm.	The solid waste generated due to overhaul of blower, compressor system, gas engines and internals along with accessories at the end of the product life time. The project owner will monitor the waste generated and will either landfill the product or handover to agency for recycling depending upon the type of products.																
Program of Risk Management Actions to achieve the target(s):	<table border="1"> <thead> <tr> <th>S.No.</th> <th>Action and targets</th> <th>Responsibility</th> <th>Resource Requirement</th> <th>Target to be Achieved by (insert date)</th> <th>Key Performance Indicators (KPI)</th> <th>Targets achieved on (insert date)</th> </tr> </thead> <tbody> <tr> <td>1</td> <td>Monitoring of solid waste generated due to overhaul of blower, compressor system, gas engines and internals and at the end of the product life time</td> <td>Project Owner</td> <td>01</td> <td>29/05/2020</td> <td>Quantum of solid waste generated is assessed on an annual basis</td> <td>29/05/2020</td> </tr> </tbody> </table> <table border="1"> <tr> <td>Date of Closing the Program:</td> <td>28/05/2030</td> </tr> </table> <p>The quantum of solid waste released due to overhaul of blower, compressor system, gas engines and internals and at the end of the product life time is monitored during the crediting period and will be submitted for verification</p>	S.No.	Action and targets	Responsibility	Resource Requirement	Target to be Achieved by (insert date)	Key Performance Indicators (KPI)	Targets achieved on (insert date)	1	Monitoring of solid waste generated due to overhaul of blower, compressor system, gas engines and internals and at the end of the product life time	Project Owner	01	29/05/2020	Quantum of solid waste generated is assessed on an annual basis	29/05/2020	Date of Closing the Program:	28/05/2030
S.No.	Action and targets	Responsibility	Resource Requirement	Target to be Achieved by (insert date)	Key Performance Indicators (KPI)	Targets achieved on (insert date)											
1	Monitoring of solid waste generated due to overhaul of blower, compressor system, gas engines and internals and at the end of the product life time	Project Owner	01	29/05/2020	Quantum of solid waste generated is assessed on an annual basis	29/05/2020											
Date of Closing the Program:	28/05/2030																
QA/QC procedures:	Record will be maintained and submitted during verification.																



Describe whether the Project Activity has achieved the targets set out in this Program of Risk Management Actions. If yes, describe the outcome(s).	The project owner will monitor the amount of solid waste released due to overhaul of blower, compressor system, gas engines and internals and at the end of the product life time is monitored and depending upon the type of product is either landfilled/recycled.
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<b>Data / Parameter:</b>	<b>Generation of wastewater</b>																
Objective of the Program of Risk Management Actions	<b>Program of Risk Management Actions for collection and recycling of waste water (PRMA 09)</b>																
Purpose:	To monitor environmental impact identified as not harmful in the risk assessment and to develop a program of risk management actions plan to address the risk of PRMA 09.																
Describe the environment /social impact risk that needs to be mitigated.	Release of wastewater from the dewatering chambers of the gas collection systems and Leachate																
Describe the actions and targets that will be implemented to ensure that the Project Activity will avoid negative impacts that cause harm.	The released wastewater from the dewatering chambers of the gas collection systems and Leachate will be collected and sent to wastewater treatment system of Municipality for treatment as per the Water Pollution Control Regulation. The project owner has an agreement with the Municipality for collection and management of wastewater.																
Program of Risk Management Actions to achieve the target(s):	<table border="1"> <thead> <tr> <th>S.No.</th> <th>Action and targets</th> <th>Responsibility</th> <th>Resource Requirement</th> <th>Target to be Achieved by (insert date)</th> <th>Key Performance Indicators (KPI)</th> <th>Targets achieved on (insert date)</th> </tr> </thead> <tbody> <tr> <td>1</td> <td>Continuation of agreement with municipality for wastewater collection and treatment of wastewater</td> <td>Project Owner</td> <td>01</td> <td>29/05/2020</td> <td>Wastewater collected by the municipality for the purpose of treatment.</td> <td>29/05/2020</td> </tr> </tbody> </table> <table border="1"> <tr> <td>Date of Closing the Program:</td> <td>28/05/2030</td> </tr> </table> <p>The wastewater released will be collected and sent to the municipality vide agreement between project owner and municipality.</p>	S.No.	Action and targets	Responsibility	Resource Requirement	Target to be Achieved by (insert date)	Key Performance Indicators (KPI)	Targets achieved on (insert date)	1	Continuation of agreement with municipality for wastewater collection and treatment of wastewater	Project Owner	01	29/05/2020	Wastewater collected by the municipality for the purpose of treatment.	29/05/2020	Date of Closing the Program:	28/05/2030
S.No.	Action and targets	Responsibility	Resource Requirement	Target to be Achieved by (insert date)	Key Performance Indicators (KPI)	Targets achieved on (insert date)											
1	Continuation of agreement with municipality for wastewater collection and treatment of wastewater	Project Owner	01	29/05/2020	Wastewater collected by the municipality for the purpose of treatment.	29/05/2020											
Date of Closing the Program:	28/05/2030																
QA/QC procedures:	Record will be maintained and submitted during verification.																

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Describe whether the Project Activity has achieved the targets set out in this Program of Risk Management Actions. If yes, describe the outcome(s).	The project owner maintains an agreement with the municipality for collection and treatment of wastewater generated from the project facility.
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<b>Data / Parameter:</b>	<b>Batteries</b>																												
Objective of the Program of Risk Management Actions	Program of Risk Management Actions for batteries (PRMA 10)																												
Purpose:	To mitigate/reduce an environmental impact identified as harmful in the risk assessment and to develop a Program of Risk Management Actions plan to address the risk of PRMA 10.																												
Describe the environment /social impact risk that needs to be mitigated.	Battery waste generated as a result of end-of life or defect in the storage cell if not handled with utmost care may create soil and water pollution and also create health hazardous for the people working around (form leakage and spillage from batteries)																												
Describe the actions and targets that will be implemented to ensure that the Project Activity will avoid negative impacts that cause harm.	<ul style="list-style-type: none"> <li>Batteries if used will be maintained properly so that any kind of leakage and spillage from batteries can be avoided.</li> <li>Batteries if used will be disposed off by depositing with the dealer, manufacturer, importer, assembler, registered recycler, reconditioned or at the designated collection centers,</li> </ul>																												
Program of Risk Management Actions to achieve the target(s):	<table border="1" style="width: 100%; border-collapse: collapse;"> <thead> <tr> <th style="background-color: #e1eef6;">S.No.</th> <th style="background-color: #e1eef6;">Action and targets</th> <th style="background-color: #e1eef6;">Responsibility</th> <th style="background-color: #e1eef6;">Resource Requirement</th> <th style="background-color: #e1eef6;">Target to be Achieved by (insert date)</th> <th style="background-color: #e1eef6;">Key Performance Indicators (KPI)</th> <th style="background-color: #e1eef6;">Targets achieved on (insert date)</th> </tr> </thead> <tbody> <tr> <td style="text-align: center;">1</td> <td>Disposal of Used batteries (if any) as per regulator norms</td> <td>Project owner</td> <td style="text-align: center;">1</td> <td style="text-align: center;">29/05/2020</td> <td>Battery Disposal Record</td> <td style="text-align: center;">29/05/2020</td> </tr> <tr> <td> </td> <td> </td> <td> </td> <td> </td> <td> </td> <td> </td> <td> </td> </tr> <tr> <td colspan="3">Date of Closing the Program:</td> <td colspan="2" style="text-align: center;">28/05/2030</td> <td> </td> <td> </td> </tr> </tbody> </table>	S.No.	Action and targets	Responsibility	Resource Requirement	Target to be Achieved by (insert date)	Key Performance Indicators (KPI)	Targets achieved on (insert date)	1	Disposal of Used batteries (if any) as per regulator norms	Project owner	1	29/05/2020	Battery Disposal Record	29/05/2020								Date of Closing the Program:			28/05/2030			
S.No.	Action and targets	Responsibility	Resource Requirement	Target to be Achieved by (insert date)	Key Performance Indicators (KPI)	Targets achieved on (insert date)																							
1	Disposal of Used batteries (if any) as per regulator norms	Project owner	1	29/05/2020	Battery Disposal Record	29/05/2020																							
Date of Closing the Program:			28/05/2030																										
QA/QC procedures:	Record of batteries in particular to the disposal of defunct one will be maintained and summited during verification.																												

Describe whether the Project Activity has achieved the targets set out in this Program of Risk Management Actions. If yes, describe the outcome(s).	To be monitored.
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### B.7.3. Sampling plan

Not applicable.

### B.7.4. Other elements of the monitoring plan

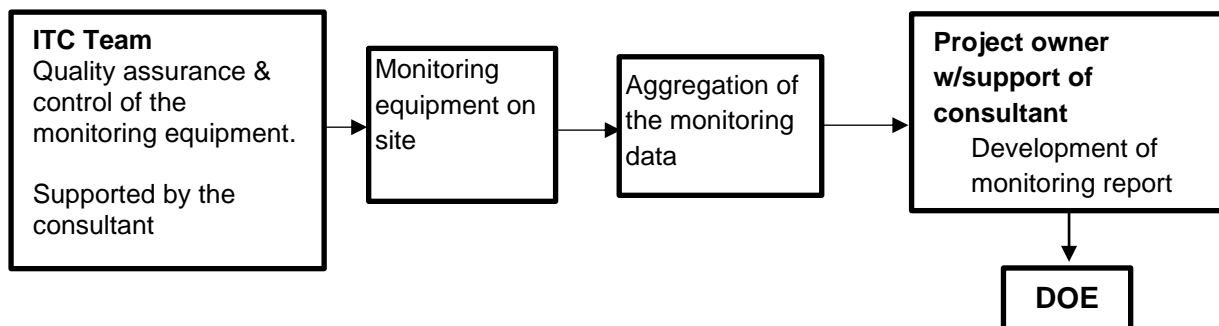
Monitoring will be carried out following the procedures set by the consolidated baseline methodology ACM0001 Version 19, and all applicable tools of the above explained parameters. The monitoring consists of:

- Amount of landfill gas combusted in power generation units
- Amount of landfill gas flared
- Temperature in the exhaust gas of the enclosed flares to estimate the flare efficiency
- Concentration of methane of the landfill gas
- Total amount of electricity exported to the grid
- Operating hours of power generation units
- Total amount of the electricity imported from the grid
- The amount and composition of fresh waste avoided from dumping waste at the solid waste disposal site

#### Responsibilities for monitoring

The project participant is responsible for the operation and maintenance of the landfill and the installed equipment. The project owner is also responsible for the administration of the data, setting up a monitoring team who will be responsible for monitoring all data required to estimate emission reductions.

In the diagram below the organization of monitoring management and data application is presented.



#### Registration of the monitored data

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The ITC Team will be responsible for quality assurance and quality control of the monitoring equipment. The data measured by the monitoring equipment will be stored and will be processed into a monitoring report, which will be submitted by the project owner. All the monitored data will be stored during the crediting period and for at least two years after the end of the crediting period.

### **Corrective actions and emergency preparedness**

The Team will regularly check the monitoring system on errors. In the case of errors, corrective actions will be undertaken by the Team, or if required, by the supplier of the monitoring equipment.

### **QA/QC procedure**

Strong quality assurance and quality control procedure will be taken to monitor the equipment and data collection. Equipment's and facilities will be subject to a regular maintenance and testing regime to ensure accuracy following supplier's manual.

## **Section C. Start date, crediting period type and duration**

### **C.1. Start date of the Project Activity**

As per project standard, start of commercial operations has been considered as the start date. Hence date of synchronization with grid as per commissioning certificate, on which project is connected to grid and started generating power and exporting to the grid is considered as start date. Start date of the project activity is the commissioning date i.e., 29/05/2020 since the commissioning certificate of gas engine is dated 29/05/2020.

### **C.2. Expected operational lifetime of the Project Activity**

31 years

### **C.3. Crediting period of the Project Activity**

Crediting Period Start date: 29/05/2020

Crediting Period End date: 28/05/2030 (both days included)

#### **C.3.1. Fixed crediting period**

The crediting period is fixed crediting period for 10 Years

#### **C.3.2. Start date of the crediting period**

29/05/2020

#### **C.3.3. Duration of the crediting period**

10 years

## Section D. Environmental impacts

### D.1. Analysis of environmental impacts

The potential environmental impacts could be occurred through air pollution, wastewater, noise and solid waste formation.

**Air Pollution:** The exhaust gas produced by this project is mainly the exhaust gas of the gas engine. PM, CO, NO, SO<sub>2</sub> and NO<sub>x</sub> measurement results<sup>36</sup> are assessed to be within permissible limit<sup>37</sup>.

**Wastewater:** The wastewater management process as practiced in the baseline will be continued. Waster is resulted from leachate water from the landfill site. Leachate is drained to the impermeable septic tank existing in the landfill and periodically removed by vacuum truck and disposed of in Wastewater Treatment Plants of Ankara Municipality (ASKİ)<sup>41</sup>.

**Noise:** The noise of this project comes from various mechanical operation and vibration. All production equipment is placed in the steel container, and measures are taken to reduce vibration and noise. The operating noise is effectively attenuated after being blocked by the solid wall. In order to further reduce the noise generated during the production process, the project adopts the following measures: First, control the noise from the sound source, and select low-noise equipment in the equipment selection; For equipment with large noise, basic vibration reduction should be adopted during installation, and indoor layout should be adopted for noise equipment, sound insulation and noise elimination measures should be taken to control the noise within the standard value. The noise of the project during operation meets the requirements of Environmental Noise Assessment and Management Regulation<sup>42</sup>.

**Solid waste:** The solid waste of the project is mainly domestic garbage, filtered dust and waste minerals. The domestic garbage and filtered dust are collected and sent to landfill site for landfill treatment.

In conclusion, the environmental impact during the project operation will be minor. The Project owner has taken appropriate measures to minimize adverse environmental impacts.

### D.2. Environmental impact assessment

An examination and evaluation were made and the measures to be taken against environmental impacts in the project introduction file were deemed sufficient. An environmental impact assessment report to assess the environmental effects of the project activity was approved with the decision of "Environmental Impact Assessment Positive" pursuant to Article 14 of the Environmental Impact

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<sup>36</sup> These values will be reported in Emission Measurement Report prepared by third-party laboratory

<sup>37</sup> According to the Industrial Air Pollution Control Regulation Annex-4 Clause <https://www.resmigazete.gov.tr/eskiler/2014/12/20141220-2.htm>

According to the Industrial Air Pollution Control Regulation Annex-5.A.7.2.1 Clause <https://www.resmigazete.gov.tr/eskiler/2014/12/20141220-2.htm>

<sup>41</sup> <https://www.aski.gov.tr/TR/ICERIK/Atiksu-Aritma/30>

<sup>42</sup> <https://www.resmigazete.gov.tr/eskiler/2010/06/20100604-5.htm>

Assessment Regulation, published in the Official Gazette dated 25.11.2014 and numbered 29186<sup>43</sup>. Outcome of the EIA study and management action plans outlined in the EIA study for mitigation of environmental and social impacts are summarized below.

**1. Disposal of wastewater to be generated within the scope of the project**

Domestic wastewater, fermentation water, wastewater generated in the wheel washing unit, leachate water, and leachate filtered from solid wastes will be collected in the lagoon and drawn with a vacuum truck, and sent to the treatment plant of the Municipality. Surface water drainage channels will ensure the transmission of rainwater that will pass to the surface flow outside the facility.

**2. Disposal of solid wastes to be generated within the scope of the project**

Contaminated wastes, hazardous wastes, fluorescent lamps, vehicle-related wastes, ink and cartridge wastes, expired tires and vegetable waste oils will be disposed of within the project area. Medical wastes, waste batteries and accumulators will be delivered to companies holding the relevant environmental license. Waste oils will be sent to the Waste-Derived Fuel Production Facility.

**3. Disposal methods of gas emissions**

To reduce exhaust gas emissions, the maintenance of the vehicles will be done regularly. Combustion gas and dust emissions that will occur as a result of the process will be discharged to the atmosphere through a chimney in line with the limit values. Methane gas will be collected through the drainage system and converted into electrical energy by burning it in the Electric Power Generation Facility from Methane Gas.

**4. Noise and precautions to be taken**

Noise levels do not exceed the limit values and protective tools and equipment will be provided to plant workers to ensure that they are not affected by noise.

**5. Measures to be taken against odor, dust, pest, and fly breeding**

To minimize the odor released during the discharge and laying of solid waste, the waste is covered with daily cover soil to prevent contact with air.

**6. Measures to be taken for other effects**

No waste or wastewater will be discharged to streams and lakes due to the activity, so there is no negative impact on water bodies. Since the conservation areas are far from the project area, the species will not be affected. No adverse effects are expected on settlements.

**7. Measures to be taken in terms of human health and environment, health and safety measures**

Within the scope of the project, local regulations regarding Occupational Health and Safety will be complied with to prevent harm to the environment and human health.

**8. Emergency action plan**

The relevant regulation was taken into account while establishing emergency response and evacuation methods.

**9. Public Participation Meeting**

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<sup>43</sup> <https://www.resmigazete.gov.tr/eskiler/2014/11/20141125-1.htm>

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A meeting was held to inform the public about the project and to reflect their views on the EIA study. During the preparation of the EIA Report, the opinions and suggestions obtained from the meeting were taken into account. There was not any grievance stated regarding to the project activity.

## **Section E. Environmental and social safeguards**

Project activity involves several waste management technologies including LFG extraction and utilization of the produced LFG for electricity generation.



## E.1. Environmental safeguards

Impact of Project Activity on		Information on Impacts, Do-No-Harm Risk Assessment and Establishing Safeguards									Project Owner's Conclusion	
		Description of Impact (both positive and negative)	Legal requirement / Limit	Do-No-Harm Risk Assessment			Risk Mitigation Action Plans		Do-No-Harm Residual Risk Assessment		Self-Declaration	
				Not Applicable (No actions required)	Harmless (No actions required)	Harmful (Actions required)	Operational Controls	Program of Risk Management Actions	Re-evaluate Risks	Monitoring	Explanation of Conclusion	The Project Activity will not cause any harm
<b>Environmental impacts on the identified categories<sup>44</sup> indicated below.</b>	Indicators for environmental impacts	Describe anticipated environmental impacts, both positive and negative from all sources (stationary and mobile), that may result from the Project Activity, within and outside the project boundary, over which the Project Owner(s) has control, and beyond what would reasonably be expected to occur in the absence of the Project Activity.	Describe the applicable national regulatory requirements /legal limits related to the identified risks of environmental impacts.	If no environmental impacts are anticipated, then the Project Activity is unlikely to cause any harm (is safe) and shall be indicated as <b>Not Applicable</b> (No actions required)	If environmental impacts are anticipated, but are expected to be in compliance with applicable national regulatory requirements/ below the legal limits, then the Project Activity is unlikely to cause any harm (is safe) and shall be indicated as <b>Harmless</b> (No actions required)	If environmental impacts are anticipated that will not be in compliance with the applicable national regulatory requirements or are likely to exceed legal limits, then the Project Activity is likely to cause harm (may be un-safe) and shall be indicated as <b>Harmful</b> (Actions required).	Describe the operational controls and best practices, focusing on how to implement and operate the Project Activity, to reduce the risk of impacts that have been identified as <b>Harmful</b> .	Describe the Program of Risk Management Actions (refer to Table 3), focusing on additional actions (e.g., installation of pollution control equipment) that will be adopted to reduce the risk of impacts that have been identified as <b>Harmful</b> .	Re-evaluate risks after Risk Mitigation Action Plans have been developed (refer to previous two columns) for impacts that have been identified as <b>Harmful</b> . Indicate whether the risks have been eliminated or reduced and, where appropriate, indicate them as <b>Harmless</b> (No actions required)	Describe the monitoring approach and the parameters to be monitored for each impact that has been identified as <b>Harmful</b> and described in the PSF (refer to Table 3).	Describe how the Project Owner has concluded that the Project Activity is likely to achieve the identified Risk Mitigation Action Plan targets for managing risks to levels that are unlikely to cause any harm.	Confirm that the Project Activity risks of negative environmental impacts are expected to be managed to levels that are unlikely to cause any harm (Mark +1 for <b>Yes</b> or and -1 for <b>No</b> )
<b>Environmental Safeguards</b>												
<b>Environment - Air</b>	SO <sub>x</sub> emissions	Capture and utilization of LFG for power generation does not result in emission of SO <sub>x</sub> . Therefore, environmental impact is not anticipated from	The national legal limit as specified by Ministry of Environment, Urbanization and Climate Change <sup>45</sup> .	Since the emission of SO <sub>x</sub> is within permissible limit, no environmental impact is anticipated	Not Applicable	Not Applicable	Not Applicable	Although emission of SO <sub>x</sub> is within permissible limit, the stack parameter of exhaust gas from gas turbine will be monitored once in a year	Not Applicable	Not Applicable.	The project activity includes capture and use of LFG for the purpose of power generation and SO <sub>x</sub> is within permissible limit. The pretreatment of LFG before being used in furtherance reduce the release of SO <sub>x</sub> in the exhaust of gas turbine.	+1

<sup>44</sup> sourced from the CDM SD Tool and the sample reports are available ( <https://www4.unfccc.int/sites/sdcmicrosite/Pages/SD-Reports.aspx> )

<sup>45</sup> <https://cevreselgostergeler.csb.gov.tr/en/number-of-exceedances-of-air-quality-limit-values-i-85998>

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		the project activity.						through third party agency to assess any release of SOX in the exhaust gas within the permissible limit of Ministry of Environment. Monitoring details is outlined under section B.7.2 PRMA 02		exhaust gas from gas turbine will be monitored once in a year through third party agency to assess any release of SOX in the exhaust gas within the permissible limit of Ministry of Environment. Monitoring details is outlined under section B.7.2 PRMA 02		
<i>NO<sub>x</sub> emissions</i>	Capture and utilization of LFG for power generation does not result in emission of NO <sub>x</sub> . Therefore, environmental impact is not anticipated from the project activity.	The national legal limit of NO <sub>x</sub> emissions as specified in Industrial Air Pollution Control Regulation <sup>46</sup> .	Since the emission of NOX is within permissible limit, no environmental impact is anticipated	Not Applicable	Not Applicable	Not Applicable	Not Applicable. Although NOX is within permissible limit, the stack parameter of exhaust gas from gas turbine will be monitored once in a year through third party agency to assess any release of NOX in the exhaust gas within the permissible limit of Ministry of Environment. Monitoring details is outlined under section B.7.2 PRMA 03	Not Applicable	Not Applicable. Although the emission of NOX is within permissible limit, the stack parameter of exhaust gas from gas turbine will be monitored once in a year through third party agency to assess any release of NOX in the exhaust gas within the permissible limit of Ministry of Environment. Monitoring details is outlined under section B.7.2 PRMA 03	The project activity includes capture and use of LFG for the purpose of power generation and does not result in release of NO <sub>x</sub> . NOX is within permissible limit. The pretreatment of LFG before being used in furtherance reduces the release of NOX in the exhaust of gas turbine.	+1	
<i>CO<sub>2</sub> emissions</i>	Utilization of methane for power generation in gas engine results in emission of CO <sub>2</sub> , however considering the renewable origin of fossil fuel the generation of	There are no laws and regulations which limit the CO <sub>2</sub> emissions by LFG power generation projects in Turkey.	Not Applicable as no emissions occur in the project scenario and therefore is not expected to or does not cause any harm. The project activity results	Not Applicable. No Action Required	Not Applicable. No action required	Not Applicable	Not Applicable	Not Applicable	Not Applicable	The generated electricity the project activity will be continuously measured and the related CO <sub>2</sub> emission reduction will be	The project is expected to result in lower CO <sub>2</sub> emission by replacing generation of electricity in existing grid connected power plant of fossil fuel origin.	+1

<sup>46</sup> <https://www.mevzuat.gov.tr/mevzuatmetin/yonetmelik/7.5.13184%20ek.doc>

		CO2 is not considered. The project reduces the CO <sub>2</sub> emission by avoiding replacing equivalent electricity generated by the power plant connected power grid.		in reduced CO <sub>2</sub> emissions by replacing high carbon intensive grid power with renewable based generation.						calculated according to the applied method. Detailed monitoring plan and approach is presented as a part of E+ monitoring under section B. 7.1.		
	<i>CO emissions</i>	Emission of CO due to utilization of LFG in gas engine is anticipated within the permissible limit specified by Ministry of Environment.	The national legal limit of CO emissions as specified in Industrial Air Pollution Control Regulation <sup>47</sup> .	Since the emission of CO is within permissible limit, no environmental impact is anticipated	Since release of CO due to utilization of LFG in gas engine is within the permissible limit of the Ministry of Environment therefore the environmental impact is anticipated as harmless.	Not Applicable. No action required	Not Applicable. No action required	Although the in emission of CO is within the permissible limit the stack parameter of exhaust gas from gas turbine will be monitored once in a year through third party agency to assess release of CO in the exhaust gas within the permissible limit of Ministry of Environment. Monitoring details is outlined under section B.7.2 PRMA 04	Not Applicable	Not Applicable.  The project activity is anticipated to result in emission of CO within the permissible limit the stack parameter of exhaust gas from gas turbine will be monitored once in a year through third party agency to assess release of CO in the exhaust gas within the permissible limit of Ministry of Environment. Monitoring details is outlined under section B.7.2 PRMA 04	The project activity includes capture and use of LFG for the purpose of power generation and the resulting emission of CO is assessed to be within permissible limit.	+1
	<i>Suspended particulate matter (SPM) emissions</i>	Emission of particulate matter due to utilization of LFG in gas engine is negligible and is within the permissible limit specified by Ministry of Environment.	The national legal limit as specified by Ministry of Environment, Urbanization and Climate Change <sup>48</sup> .	Since the emission of CO is within permissible limit, no environmental impact is anticipated	Since release of Particulate matter due to utilization of LFG in gas engine is negligible and within the permissible limit of the Ministry of Environment therefore the environmental impact is anticipated as harmless.	Not Applicable. No action required	Not Applicable. No action required	Although the project activity is anticipated to result in negligible emission of Particulate matter within the permissible limit, the stack parameter of exhaust gas from gas turbine will be monitored once in a year through third party agency to	Not Applicable	Not Applicable.  The project activity is anticipated to result in emission of Particulate matter within the permissible limit the stack parameter of exhaust gas from gas turbine will be	The project activity includes capture and use of LFG for the purpose of power generation and the resulting emission of Particulate matter is assessed to be negligible and is also within permissible limit.	+1

<sup>47</sup> <https://www.mevzuat.gov.tr/mevzuatmetin/yonetmelik/7.5.13184%20ek.doc>

<sup>48</sup> <https://cevreselgostergeler.csb.gov.tr/en/number-of-exceedances-of-air-quality-limit-values-i-85998>

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								assess release of Particulate matter in the exhaust gas within the permissible limit of Ministry of Environment. Monitoring details is outlined under section B.7.2 PRMA 05		monitored once in a year through third party agency to assess release of Particulate matter in the exhaust gas within the permissible limit of Ministry of Environment. Monitoring details is outlined under section B.7.2 PRMA 05		
<i>Fly ash emissions</i>	The Project activity includes capture and utilization of LFG for power generation and does not result in release of Fly ash.	The national legal limit specified by Ministry of Environment, Urbanization and Climate Change <sup>49</sup> .	No negative environmental impact is anticipated as the project activity does not result in release of Fly ash.	Since the project activity does not result in release of fly ash therefore the anticipated impact is harmless.	Not Applicable. No action required	Not Applicable. No action required	Not Applicable. No action required	Not Applicable. No action required	Not Applicable. No action required	The Project activity includes capture and utilization of LFG for power generation and does not result in release of Fly ash therefore no verification is required.	Not Applicable.	
<i>Non-Methane Volatile Organic Compounds (NMVOCs)</i>	The project reduces NMVOCs emission due to combustion of LFG that is previously released to the atmospheric	The national legal limit specified by Ministry of Environment, Urbanization and Climate Change <sup>50</sup> .	The project reduces NMVOCs emission that were released to the atmosphere and hence positive environmental impact is anticipated.	Since the project activity results in reduction of NMVOC in compared to the baseline therefore the impact is considered as harmless.	Not Applicable. No action required	Not Applicable. No action required	Not Applicable. No action required	Not Applicable. No action required	The quantum of NMVOC reduced will not be monitored	The project will result in lowering of NMVOCs emission than the baseline due to combustion of LFG in gas engine. However, the quantum of NMVOC in the input gas and exhaust gas will not be monitored and therefore the parameter will not scored.	Not Applicable.	
<i>Odor emissions</i>	The project reduces odor emissions by LFG recovery. However, there will be odour due to leachate collection system, sludge generation which is a continuation from pre project activity.	No environmental regulation is associated to control the odour	The project reduces odor due to capture and utilisation of LFG and prevention of its release to the atmosphere and hence positive environmental impact is anticipated. However, the project activity has no control over the odour due to leachate collection system,	Since the project activity results in reduction of odor in compared to the baseline (only against the landfill gas) therefore the impact is considered as harmless. The project activity has no control over the odour due to leachate collection system, sludge generation	Not Applicable. No action required	Not Applicable. No action required	Not Applicable. No action required	Not Applicable. No action required	Not Applicable. No action required. Since the odour cannot be monitored therefore the same is not applicable.	The project will result in lower odor emissions than the baseline throughout the crediting period, however the parameter cannot be monitored nor scored. The project activity has no control over the odour due to leachate collection system, sludge generation	Not Applicable.	

<sup>49</sup> <https://cevreselgostergeler.csb.gov.tr/en/number-of-exceedances-of-air-quality-limit-values-i-85998>

<sup>50</sup> <https://cevreselgostergeler.csb.gov.tr/en/number-of-exceedances-of-air-quality-limit-values-i-85998>

				sludge generation.								
<i>Noise Pollution</i>	The gas engines may cause noise pollutions during operation.	According to the Regulation on Evaluation and Management of Environmental Noise <sup>51</sup>	Since the monitored noise is within the permissible limit no negative environmental impact is anticipated.	The noise by the project is expected to be lower than the permissible limits, hence the project is deemed Harmless	Not Applicable. No action required	Not Applicable. No action required	The noise level is anticipated to be within the permissible limit; however the parameter will be monitored once in a year through third party agency to assess and will be monitored as PRMA 01	Not Applicable	The noise level is anticipated to be within the permissible limit, however the parameter will be monitored once in a year through third party agency to assess and will be monitored as PRMA 01	The noise from the project activity is within the permissible limits.	+1	
<i>Methane emissions</i>	The project reduces methane emission through capture and utilization of LFG which was previously released to the atmosphere. However, there might be methane emissions due to leakage in collection network of the LFG gas collection system.	No legal regulation for emission of methane	The project reduces methane emission through capture and utilization of LFG that were released to the atmosphere and hence positive environmental impact is anticipated. The methane leakage is very low and are immediately identified/detected and arrested and are not likely to cause any environmental harm.	Since the project activity results in reduction of methane emission through capture and utilization of LFG in compared to the baseline therefore the impact is considered as harmless. The leakage of LFG/ methane if any is considered as harmless to environment.	Not Applicable. No action required	Not Applicable. No action required	Not Applicable. No action required	Not Applicable. No action required	The quantum of methane release avoided to the atmosphere is assessed based on two monitored data parameters (a) quantum of LFG utilized (b) methane content in the LFG. The parameters is monitored as E+ parameters under section B.7.1 The leak is any immediately identified by gas sensors. Once identified the leakage point is identified using thermographic imager to take appropriate measures towards arresting the leakage. The details of monitoring of methane leakage is outlined under section B.7.2. (PRMA 6)	The project will result in lowering of in reduction of methane emission through capture and utilization of LFG than the baseline where LFG was directly released to atmosphere. The quantum of methane avoided is based on the monitoring of two data parameters (a) quantum of LFG utilized (b) methane content in the LFG and therefore the parameters is scored.	+1	

<sup>51</sup> <https://www.resmigazete.gov.tr/eskiler/2010/06/20100604-5.htm>

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Environment - Land	<i>Solid waste Pollution from Plastics</i>	The project includes capture and utilization of methane and does not result in solid waste pollution from plastic nor does it alters the existing process of solid waste management practice.	Solid Waste Regulation <sup>52</sup>	Since the project activity does not results in solid waste pollution from plastic therefore no negative environmental impact is anticipated.	Since the project activity does not results in solid waste pollution from plastic therefore the project is deemed Harmless	Not Applicable. No action required	Not Applicable. No action required	Not Applicable. No action required	Not Applicable. No action required	Not Applicable. No action required	Not Applicable. No action required	Not Applicable. No action required	
	<i>Solid waste Pollution from Hazardous wastes</i>	Operation of the project activity is most likely to result in release of waste oil/spilled oil/lubricant (outlined under section contamination from oil)	According to the "Waste Control Regulation "hazardous waste shall be taken by the licensed recycling firms.	Since the project activity does not results in Solid waste Pollution from Hazardous wastes therefore no negative environmental impact is anticipated.	Since the project activity does not results in Solid waste Pollution from Hazardous wastes therefore the project is deemed Harmless Since the Waste oil/spilled oil/lubricant are likely to be generated in small quantity and appropriate disposal measures are being introduced therefore the project activity is unlikely to cause any harm.	Not Applicable. No action required	Not Applicable. No action required	Not Applicable. No action required	Not Applicable. No action required	Not Applicable. No action required	Not Applicable. No action required outlined under section contamination from oil)	Not Applicable. (scored under section contamination from oil)	
	<i>Solid waste Pollution from Bio-medical wastes</i>	The project includes capture and utilization of methane and does not result in Solid waste Pollution from Bio-medical wastes nor does it alters the existing process of solid waste management practice.	Solid Waste Regulation	Since the project activity does not results Solid waste Pollution from Bio-medical wastes therefore no negative environmental impact is anticipated.	Since the project activity does not results in Solid waste Pollution from Bio-medical wastes therefore the project is deemed Harmless	Not Applicable. No action required	Not Applicable. No action required	Not Applicable. No action required	Not Applicable. No action required	Not Applicable. No action required	Not Applicable. No action required	Not Applicable. No action required	Not Applicable. No action required
	<i>Solid waste Pollution from E-wastes</i>	The project includes capture and utilization of methane and	Solid Waste Regulation	Since the project activity does not results Solid	Since the project activity does not results in	Not Applicable. No action required	Not Applicable. No action required	Not Applicable. No action required	Not Applicable. No action required	Not Applicable. No action required	Not Applicable. No action required	Not Applicable. No action required	Not Applicable. No action required

<sup>52</sup> <https://www.resmigazete.gov.tr/eskiler/2015/04/20150402-2.htm>

	does not result in Solid waste Pollution from E-wastes nor does it alters the existing process of solid waste management practice		waste Pollution from E-wastes therefore no negative environmental impact is anticipated.	Solid waste Pollution from E-wastes therefore the project is deemed Harmless							
<i>Solid waste Pollution from Batteries</i>	Battery waste generated as a result of end-of life or defect in the storage cell	Solid Waste Regulation	Battery waste generated as a result of end-of life or defect in the storage cell if not handled with utmost care may create soil and water pollution and also create health hazardous for the people working around (form leakage and spillage from batteries).	Batteries if used will be maintained properly so that any kind of leakage and spillage from batteries can be avoided.	Since appropriate action are being planned therefore the project activity is unlikely to cause any harm.	Not Applicable. No action required	Not Applicable. No action required	Not Applicable. No action required	Record of batteries in particular to the disposal of defunct one will be maintained and summited during verification	Batteries if used will be disposed off by depositing with the dealer, manufacturer, importer, assembler, registered recycler, reconditioned or at the designated collection centers,	+1
<i>Solid waste Pollution from end-of-life products/ equipment</i>	Generation of solid waste either due to end of product life or due to overhaul of blower, compressor system, gas engines and internals.	Solid Waste Regulation	The solid waste generated due to end of life or overhaul activity is either landfilled /recycled depending upon the nature of the material in accordance to the Solid Waste Regulation, The waste product does not harms the environment and therefore no negative environmental impact is anticipated.	Since the product of end of life or machinery overhaul are non-harmful therefore no negative environmental impact is anticipated.	Not Applicable. No action required	Not Applicable. No action required	Not Applicable. No action required	Not Applicable. No action required	The amount of waste generated at the end of product lifetime or overhaul of blower, compressor system, gas engines and internals will be recorded. Monitoring details is outlined under section B.7.2 PRMA 08	The project owner being into the business of waste management has a practice of monitoring solid waste generated as part of plant operation and depending upon the environmental norms landfill/ recycle the waste.	+1
<i>Soil Pollution from Chemicals (including Pesticides, heavy metals, lead, mercury)</i>	The project includes capture and utilization of methane and does not result in Soil Pollution from Chemicals (including Pesticides, heavy metals, lead, mercury) nor does it	Solid Waste Regulation	Since the project activity does not results Soil Pollution from Chemicals (including Pesticides, heavy metals, lead, mercury) therefore no negative	Since the project activity does not results in Soil Pollution from Chemicals (including Pesticides, heavy metals, lead, mercury) therefore the project is	Not Applicable. No action required	Not Applicable. No action required	Not Applicable. No action required	Not Applicable. No action required	Not Applicable. No action required	Not Applicable. No action required	Not Applicable.

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		alters the existing process of solid waste management practice		environmental impact is anticipated.	deemed Harmless							
	<i>Soil erosion</i>	The project includes capture and utilization of methane and does not result in Solid erosion	Areas vulnerable to the erosion is determined by the ministry according to the Soil Protection Law.	Since the project activity does not results Soil erosion therefore no negative environmental impact is anticipated.	Since the project activity does not results in Soil erosion therefore the project is deemed Harmless	Not Applicable. No action required	Not Applicable. No action required	Not Applicable. No action required	Not Applicable. No action required	Not Applicable. No action required	Not Applicable.	Not Applicable.
	<i>Contamination from waste oil (spilled/ released oil)</i>	Release of waste oils/ lubricants from plant operation that is considered as hazardous.	According to the "Waste Control Regulation "hazardous waste shall be taken by the licensed recycling firms.	However, released oil/ lubricants can be result in environmental impact if exposed to water bodies.	Released oil/ lubricants can be harmful to environment.	Released oil/ lubricants can be harmful to environment therefore action required	The spilled oil will be collected through placement of appropriate container and periodic draining of residuals from oil drain	The collected oil will be hand overed/ sold to recycling firm	The measures will eliminate the risk of any contamination of hazardous mater with water source	The quantum of spilled oil/ lubricants collected will be monitored Monitoring details is outlined under section B.7.2 PRMA 07	The organization is already arresting any oil spill in the gas turbine area and is hand overing the collected oil to recycling agency.	+1
	<i>Fire Hazard</i>	LFG emissions due to leakage might lead to fire hazard.	Regulation on Preventing Major Industrial Accidents and Reducing Their Effects <sup>53</sup>	The incident is more of hazard than environmental concern. As a part of safety measures gas leakage if any will be immediately identified using gas sensors. Once identified the leakage will be arrested immediately	Fire hazard will be prevented through use of gas sensors, since there is no environmental harm envisaged the project is deemed Harmless	Not Applicable. No action required	Not Applicable. No action required	Not Applicable. No action required	Not Applicable. No action required	The quantum of LFG leakage will be detected using gas sensors followed by thermographic imager. The details of monitoring of methane leakage are outlined under section B.7.2. (PRMA 6)	The leak is any is immediately identified by gas sensors. Once release of LFG is assessed the leakage point is identified using thermographic imager to take appropriate measures towards arresting the leakage. However, the quantum of leakage cannot be monitored.	Not Applicable.
<b>Environment - Water</b>	<i>Reliability/ accessibility of water supply</i>	The project includes capture and utilization of methane and does not impact Reliability/ accessibility of water supply	N/A	The project includes capture and utilization of methane and does not impact Reliability/ accessibility of water supply and hence no negative environmental impact is anticipated	The project includes capture and utilization of methane and does not impact Reliability/ accessibility of water supply and hence the project is deemed Harmless	Not Applicable. No action required	Not Applicable. No action required	Not Applicable. No action required	Not Applicable. No action required	Not Applicable. No action required	Not Applicable.	Not Applicable.
	<i>Water Consumption from ground and other sources</i>	The project includes capture and utilization of methane and might require water from	Not Applicable	Not Applicable	Not Applicable	Not Applicable. No action required	Not Applicable. No action required	Not Applicable. No action required	Not Applicable. No action required	Not Applicable. No action required	Supply water from local body will be used is necessary and necessary approval to be obtained.	Not Applicable.

<sup>53</sup> <https://www.mevzuat.gov.tr/mevzuat?MevzuatNo=31298&MevzuatTur=7&MevzuatTertip=5>



		ground/other source.										
<i>Generation of wastewater</i>	Wastewater might be generated from the dewatering chambers of the gas collection systems. Waste water also includes Leachate.	Water Pollution Control Regulation <sup>54</sup>	Generated wastewater and Leachate are sent to wastewater treatment system of Ankara Municipality <sup>55</sup> for treatment as per the Water Pollution Control Regulation. The project owner also has an agreement with the Municipality for collection and management of waste water therefore no environmental impact is anticipated	Wastewater is collected in a closed loop and sent to wastewater treatment facility hence the environmental impact from waste water is deemed to be harmless.	Not Applicable. No action required	Not Applicable. No action required	Not Applicable. No action required	Not Applicable. No action required	Quantum of wastewater collected and treated by municipality vide agreement between project owner and municipality will be monitored	Closed loop system is in place of capture release of waste water and its transmission to the waste water treatment facility. The project owner also has an agreement with the Municipality for collection and management of waste water.	+1	
<i>Wastewater discharge without/with insufficient treatment</i>	The project includes capture and utilization of methane and does not generate wastewater that could be discharged without treatment. Waste water treatment process as adopted in the baseline as per national regulation is continued.	Water Pollution Control Regulation,	The project includes capture and utilization of methane and does not generate wastewater that could be discharged without treatment. Waste water treatment process as adopted in the baseline as per national regulation is continued. Therefore, no negative environmental impact is anticipated from the project activity.	The project includes capture and utilization of methane and does not generate wastewater that could be discharged without treatment. Waste water treatment process as adopted in the baseline as per national regulation is continued. Hence the project is deemed Harmless.	Not Applicable. No action required	Not Applicable. No action required	Not Applicable. No action required	Not Applicable. No action required	The project includes capture and utilization of methane and does not generate wastewater that could be discharged without treatment. Waste water treatment process as adopted in the baseline as per national regulation is continued.	Not Applicable		
<i>Pollution of Surface,</i>	The project includes capture and utilization of	Water Pollution Control Regulation,	The project includes capture and	The project includes capture and	Not Applicable. No action required	Not Applicable. No action required	Not Applicable. No action required	Not Applicable. No action required	The project includes capture and utilization of methane and does not	Not Applicable		

<sup>54</sup> <https://www.mevzuat.gov.tr/mevzuat?MevzuatNo=7221&MevzuatTur=7&MevzuatTertip=5>

<sup>55</sup> <https://www.aski.gov.tr/TR/ICERIK/Atiksu-Aritma/30>

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	<i>Ground and/or Bodies of water</i>	methane and does not generate wastewater that could pollute surface/ground water bodies.		utilization of methane and does not generate wastewater that could pollute surface/ground water bodies. Therefore, no negative environmental impact is anticipated from the project activity.	utilization of methane and does not generate wastewater that could pollute surface/ground water bodies. Hence the project is deemed Harmless.	action required	action required		action required	action required	generate wastewater that could pollute surface/ground water bodies.	
	<i>Pollution of leachate</i>	The project includes capture and utilization of methane and does not result into Pollution of leachate. Waste water treatment process as adopted in the baseline as per national regulation is continued.	Water Pollution Control Regulation,	The project includes capture and utilization of methane and does not result into Pollution of leachate. Waste water treatment process as adopted in the baseline as per national regulation is continued. Therefore, no negative environmental impact is anticipated from the project activity.	The project includes capture and utilization of methane and does not result in Pollution of leachate. Waste water treatment process as adopted in the baseline as per national regulation is continued. Hence the project is deemed Harmless.	Not Applicable. No action required	Not Applicable. No action required	Not Applicable. No action required	Not Applicable. No action required	Not Applicable.	The project includes capture and utilization of methane and does not result in Pollution of leachate. Waste water treatment process as adopted in the baseline as per national regulation is continued.	Not Applicable
<b>Environment – Natural Resources</b>	<i>Conserving mineral resources</i>	The project includes capture and utilization of methane and does not result in conservation of natural resources	Not Applicable	Not Applicable	Not Applicable	Not Applicable	Not Applicable	Not Applicable	Not Applicable	Not Applicable	Not Applicable	Not Applicable
	<i>Protecting/enhancing plant life</i>	The project includes capture and utilization of methane and does not result in protection/enhancement of plant life	Not Applicable	Not Applicable	Not Applicable	Not Applicable	Not Applicable	Not Applicable	Not Applicable	Not Applicable	The project includes capture and utilization of methane and does not result in protection/enhancing species diversity as the project activity is carried out in existing landfill site	Not Applicable
	<i>Protecting/enhancing species diversity</i>	The project includes capture and utilization of methane and does not result in protection/enhancing species diversity	Not Applicable	Not Applicable	Not Applicable	Not Applicable	Not Applicable	Not Applicable	Not Applicable	Not Applicable	The project includes capture and utilization of methane and does not result in protection/enhancing species diversity as the project activity is carried out in existing landfill site	Not Applicable

<i>Protecting/enhancing forests</i>	The project includes capture and utilization of methane and does not result in protection/enhancing forests	Not Applicable	Not Applicable	Not Applicable	Not Applicable	Not Applicable	Not Applicable	Not Applicable	Not Applicable	Not Applicable	The project includes capture and utilization of methane and does not result in protection/enhancing forests as the project activity is not carried out forest land	Not Applicable
<i>Protecting/enhancing other depletable natural resources</i>	The project includes capture and utilization of methane and does not result in protection/enhancing other depletable natural resources	Not Applicable	Not Applicable	Not Applicable	Not Applicable	Not Applicable	Not Applicable	Not Applicable	Not Applicable	Not Applicable	The project includes capture and utilization of methane and does not result in protection/enhancing other depletable natural resources	Not Applicable
<i>Conserving energy</i>	The project includes capture and utilization of methane and does not result in conservation of energy	Not Applicable	Not Applicable	Not Applicable	Not Applicable	Not Applicable	Not Applicable	Not Applicable	Not Applicable	Not Applicable	The project includes capture and utilization of methane and does not result in conservation of energy	Not Applicable
<i>Replacing fossil fuels with renewable sources of energy</i>	The project utilizes LFG to generate electricity, which will replace the electricity generated by fossil fuel power plant plants.	Not Applicable	The project activity causes positive impact on the environment by replacing the fossil fuels with the renewable energy sources of energy.	Since the project activity includes generation of electricity using LFG that were previously captured	Not Applicable	Not Applicable	Not Applicable	Not Applicable	Not Applicable	The electricity generated from LFG will be monitored via electricity meters throughout the crediting period. The monitoring details is outlined in section B.7.1	The project is expected to generate and supply renewable electricity to Turkish grid, produced from capturing and utilization of LFG.	+1
<i>Replacing ODS with non-ODS refrigerants</i>	The project includes capture and utilization of methane and does not result in replacement of ODS with Non-ODS refrigerants	Not Applicable	Not Applicable	Not Applicable	Not Applicable	Not Applicable	Not Applicable	Not Applicable	Not Applicable	Not Applicable	The project includes capture and utilization of methane and does not result in replacement of ODS with Non-ODS refrigerants	Not Applicable
<i>Others</i>	-	-	-	-	-	-	-	-	-	-	-	-

**Note:** If the score is: (a) zero or greater, the overall impact is neutral or positive and there is no net harm; and (b) less than zero, the overall impact is negative and there is net harm to Environment. Score is obtained after adding the individual scores in each of the rows in the last column of the above table.

<b>Net Score:</b>	<b>+12</b>
<b>Project Owner's Conclusion in PSF:</b>	The Project Owner confirms that the Project Activity will not cause any net harm to the environment.

E.2. Social Safeguards

Impact of Project Activity on		Information on Impacts, Do-No-Harm Risk Assessment and Establishing Safeguards										Project Owner's Conclusion	
		Description of Impact (both positive and negative)	Legal requirement /Limit	Do-No-Harm Risk Assessment			Risk Mitigation Action Plans		Do-No-Harm Residual Risk Assessment		Self-Declaration		
				Not Applicable (No actions required)	Harmless (No actions required)	Harmful (Actions required)	Operational Controls	Program of Risk Management Actions	Re-evaluate Risks	Monitoring	Explanation of Conclusion	The Project Activity will not cause any harm	
<b>Social impacts on the identified categories<sup>56</sup> indicated below.</b>	Indicators for social impacts	Describe the impacts on society and stakeholders, both positive and negative, that may result from constructing and operating of the Project Activity.	Describe the applicable national regulatory requirements / legal limits related to the identified risks of social impacts.	If no social impacts are anticipated, then the Project Activity is unlikely to cause any harm (is safe) and shall be indicated as <b>Not Applicable</b> (No actions required)	If social impacts are anticipated, but are expected to be in compliance with applicable national regulatory requirements/ legal limits, then it the Project Activity is unlikely to cause any harm (is safe) and shall be indicated as <b>Harmless</b> (No actions required)	If social impacts are anticipated that will not be in compliance with the applicable national regulatory requirements/ legal limits, then the Project Activity is likely to cause harm (may be unsafe) and shall be indicated as <b>Harmful</b> (Actions required).	Describe the operational controls and best practices, focusing on how to implement and operate the Project Activity, to reduce the risk of impacts that have been identified as <b>Harmful</b> .	Describe the Program of Risk Management Actions (refer to Table 3), focusing on additional actions (e.g., construction of crèche for workers) that will be adopted to reduce the risk of impacts that have been identified as <b>Harmful</b> .	Re-evaluate risks after Risk Mitigation Actions plans have been developed (refer to previous two columns) for impacts that have been identified as Harmful. Indicate whether the risks have been eliminated or reduced and, where appropriate, indicate them as <b>Harmless</b> (No actions required)	Describe the monitoring approach and the parameters to be monitored for each impact that has been identified as Harmful and to be described in the PSF (refer to Table 3).	Describe how the Project Owner has concluded that the Project Activity is likely to achieve the identified Risk Mitigation Action Plan targets for managing risks to levels that are unlikely to cause any harm.	Confirm that the Project Activity risks of negative social impacts are expected to be managed to levels that are unlikely to cause any harm (Mark +1 for Yes or and -1 for No)	
<b>Social Safeguards</b>													
<b>Social - Jobs</b>	Long-term jobs (> 1 year) created/ lost	The project activity leads to the employment generation ( long term job opportunities) during operation.	No regulation / legal requirement for long term employment	Not Applicable	The social impact is expected to increase employment; hence the project is harmless.	Not Applicable	There are no harmful impacts of the project activity as it leads to the employment generation.	There have been no additional actions that have been identified as harmful.	There have been no additional actions that have been identified as harmful and hence this section is not applicable.	Number of people employed by the project will be monitored through checking the social insurance (SSI) recordings. Refer to Section B.7.2	Although there is no mandatory law to generate permanent employment from the project activity, however, project owner decided to provide training to the local people & generate permanent employment for local people Therefore this	+1	

<sup>56</sup> Sourced from the CDM SD Tool and the sample reports are available ( <https://www4.unfccc.int/sites/sdcmicrosite/Pages/SD-Reports.aspx> )

											parameter will be scored.  Since the project activity is already operational the project activity has already resulted in employability.  No risks have been identified and hence no risk mitigation action is required  The social impact is expected to increase in employment, which can be confirmed by the social insurance (SSI) recordings.	
	<i>New short-term jobs (&lt; 1 year) created/ lost</i>	<i>The project activity leads to the employment generation (short term job opportunities) during construction.</i>	No regulation / legal requirement for short term employment	<i>Not Applicable</i>	<i>Not Applicable</i>	<i>Not Applicable</i>	There are no harmful impacts of the project activity as it leads to the employment generation.	There have been no additional actions that have been identified as harmful.	There have been no additional actions that have been identified as harmful and hence this section is not applicable.	There is not any monitoring system applicable for this safeguard, therefore it is not taken into account	Since the project activity is already operational the project activity has already resulted in temporary employment during its construction phase.  No risks have been identified and hence no risk mitigation action is required. There is not any monitoring system applicable for this safeguard, therefore it is not taken into account.	Not Applicable
	<i>Sources of income generation increased / reduced</i>	<i>Not Applicable</i>	<i>Not Applicable</i>	<i>Not Applicable</i>	<i>Not Applicable</i>	<i>Not Applicable</i>	<i>Not Applicable</i>	<i>Not Applicable</i>	<i>Not Applicable</i>	<i>Not Applicable</i>	<i>Not Applicable</i>	<i>Not Applicable</i>
<b>Social - Health &amp; Safety</b>	<i>Disease prevention</i>	<i>The project owner provides trainings to plant workers on the topic of disease</i>	<i>There is no regulation or legal requirement for imparting of training towards</i>	<i>There is no negative social impact anticipated and the activity is not likely to cause any</i>	<i>The activity is expected to increase awareness of disease prevention among plant workers hence</i>	<i>Not Applicable</i>	<i>There are no harmful impacts of the project activity as it leads to awareness building therefor</i>	<i>There have been no additional actions that have been identified as harmful hence Program of Risk</i>	<i>There have been no additional actions that have been identified as harmful and hence this</i>	<i>The trainings given to plant workers will be monitored by participant lists.</i>	<i>The context of trainings includes awareness of disease prevention; therefore, this parameter will</i>	+1

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		prevention topics.	disease prevention.	harm therefore Not Applicable	activity can be considered as harmless. .		no operational control is required. .	Management Actions is not applicable .	section is not applicable.		be scored. Trainings will be checked by participant list.	
	Reducing / increasing accidents	The project owners provide periodic trainings to plant workers engaged in the landfill site as well as gas-based energy generation unit on accident prevention and operational risk mitigation topics.	There is no regulation or legal requirement for accident prevention.	There is no negative social impact anticipated and the activity is not likely to cause any harm therefore Not Applicable	The activity is expected to train operational personals in the landfill site as well as gas based energy generation unit on accident prevention and operational risk mitigation and hence considered harmless.	Not Applicable	There are no harmful impacts of the training as it leads to awareness building therefore no operational control is required.	There have been no additional actions that have been identified as harmful hence Program of Risk Management Actions is not applicable I.	There have been no additional actions that have been identified as harmful and hence this section is not applicable.	The trainings given to plant workers will be monitored by participant lists.	The context of trainings includes accident prevention; and operational risk management therefore, this parameter will be scored. Trainings will be checked by participant list.	+1
	Reducing / increasing crime	Not Applicable	Not Applicable	Not Applicable	Not Applicable	Not Applicable	Not Applicable	Not Applicable	Not Applicable	Not Applicable	Not Applicable	Not Applicable
	Reducing / increasing food wastage	Not Applicable	Not Applicable	Not Applicable	Not Applicable	Not Applicable	Not Applicable	Not Applicable	Not Applicable	Not Applicable	Not Applicable	Not Applicable
	Reducing / increasing indoor air pollution	Not Applicable	Not Applicable	Not Applicable	Not Applicable	Not Applicable	Not Applicable	Not Applicable	Not Applicable	Not Applicable	Not Applicable	Not Applicable
	Efficiency of health services	Not Applicable	Not Applicable	Not Applicable	Not Applicable	Not Applicable	Not Applicable	Not Applicable	Not Applicable	Not Applicable	Not Applicable	Not Applicable
	Sanitation and waste management	Not Applicable	Not Applicable	Not Applicable	Not Applicable	Not Applicable	Not Applicable	Not Applicable	Not Applicable	Not Applicable	Not Applicable	Not Applicable
	Reducing / increasing fire/explosion and risk to human life	The project owners provide periodic trainings to operational personnel at the landfill site and areas of gas engine on the topic of fire/explosion and fire drill. And operation of gas sensors.	There is no regulation or legal requirement for accident prevention.	There is no negative social impact anticipated and the activity is not likely to cause any harm therefore Not Applicable	The activity is expected to train operational personals in the landfill site as well as gas-based energy generation unit the topic of fire/explosion and fire drill and therefore considered as harmless.	Not Applicable	There are no harmful impacts of the project activity as it leads to awareness building therefore no operational control is required. .	There have been no additional actions that have been identified as harmful hence Program of Risk Management Actions is not applicable .	There have been no additional actions that have been identified as harmful and hence this section is not applicable.	The fire drill and trainings given to plant workers will be monitored by participant lists. Further, there are gas sensors to monitor fire risk due to the emission of methane.	The context of trainings will include fire and explosion and fire drill will be performed; therefore, this parameter will be scored. Trainings and fire drill will be checked by participant list.	+1
<b>Social - Education</b>	Job related training imparted or not	The project activity leads to the enhanced skill through provisioning of on job training	The created permanent employee will receive specific job training by the project owner	Not Applicable	No Action Required	No Action Required	Not Applicable	Not Applicable	No Action Required	Training records/ evidence by the project owner. Refer to Section B.7.1	Project Owner will take Initiative towards provisioning of training to employee	+1
	Educational services improved or not	Not Applicable	Not Applicable	Not Applicable	Not Applicable	Not Applicable	Not Applicable	Not Applicable	Not Applicable	Not Applicable	Not Applicable	Not Applicable

	<i>Project-related knowledge dissemination effective or not</i>	<i>Not Applicable</i>	<i>Not Applicable</i>	<i>Not Applicable</i>	<i>Not Applicable</i>	<i>Not Applicable</i>	<i>Not Applicable</i>	<i>Not Applicable</i>	<i>Not Applicable</i>	<i>Not Applicable</i>	<i>Not Applicable</i>	<i>Not Applicable</i>
	<i>Other educational issues</i>	<i>Not Applicable</i>	<i>Not Applicable</i>	<i>Not Applicable</i>	<i>Not Applicable</i>	<i>Not Applicable</i>	<i>Not Applicable</i>	<i>Not Applicable</i>	<i>Not Applicable</i>	<i>Not Applicable</i>	<i>Not Applicable</i>	<i>Not Applicable</i>
<b>Social - Welfare</b>	<i>Improving/deteriorating working conditions</i>	<i>Not Applicable</i>	<i>Not Applicable</i>	<i>Not Applicable</i>	<i>Not Applicable</i>	<i>Not Applicable</i>	<i>Not Applicable</i>	<i>Not Applicable</i>	<i>Not Applicable</i>	<i>Not Applicable</i>	<i>Not Applicable</i>	<i>Not Applicable</i>
	<i>Community and rural welfare</i>	<i>Not Applicable</i>	<i>Not Applicable</i>	<i>Not Applicable</i>	<i>Not Applicable</i>	<i>Not Applicable</i>	<i>Not Applicable</i>	<i>Not Applicable</i>	<i>Not Applicable</i>	<i>Not Applicable</i>	<i>Not Applicable</i>	<i>Not Applicable</i>
	<i>Poverty alleviation (more people above poverty level)</i>	<i>Not Applicable</i>	<i>Not Applicable</i>	<i>Not Applicable</i>	<i>Not Applicable</i>	<i>Not Applicable</i>	<i>Not Applicable</i>	<i>Not Applicable</i>	<i>Not Applicable</i>	<i>Not Applicable</i>	<i>Not Applicable</i>	<i>Not Applicable</i>
	<i>Improving / deteriorating wealth distribution/ generation of income and assets</i>	<i>Not Applicable</i>	<i>Not Applicable</i>	<i>Not Applicable</i>	<i>Not Applicable</i>	<i>Not Applicable</i>	<i>Not Applicable</i>	<i>Not Applicable</i>	<i>Not Applicable</i>	<i>Not Applicable</i>	<i>Not Applicable</i>	<i>Not Applicable</i>
	<i>Increased or / deteriorating municipal revenues</i>	<i>Not Applicable</i>	<i>Not Applicable</i>	<i>Not Applicable</i>	<i>Not Applicable</i>	<i>Not Applicable</i>	<i>Not Applicable</i>	<i>Not Applicable</i>	<i>Not Applicable</i>	<i>Not Applicable</i>	<i>Not Applicable</i>	<i>Not Applicable</i>
	<i>Women's empowerment</i>	<i>Not Applicable</i>	<i>Not Applicable</i>	<i>Not Applicable</i>	<i>Not Applicable</i>	<i>Not Applicable</i>	<i>Not Applicable</i>	<i>Not Applicable</i>	<i>Not Applicable</i>	<i>Not Applicable</i>	<i>Not Applicable</i>	<i>Not Applicable</i>
	<i>Reduced / increased traffic congestion</i>	<i>Not Applicable</i>	<i>Not Applicable</i>	<i>Not Applicable</i>	<i>Not Applicable</i>	<i>Not Applicable</i>	<i>Not Applicable</i>	<i>Not Applicable</i>	<i>Not Applicable</i>	<i>Not Applicable</i>	<i>Not Applicable</i>	<i>Not Applicable</i>
	<i>Other social welfare issues</i>	<i>Not Applicable</i>	<i>Not Applicable</i>	<i>Not Applicable</i>	<i>Not Applicable</i>	<i>Not Applicable</i>	<i>Not Applicable</i>	<i>Not Applicable</i>	<i>Not Applicable</i>	<i>Not Applicable</i>	<i>Not Applicable</i>	<i>Not Applicable</i>

**Note:** If the score is: (a) zero or greater, the overall impact is neutral or positive and there is no net harm; and (b) less than zero, the overall impact is negative and there is net harm to society. Score is obtained after adding the individual scores in each of the rows in the last column of the above table.

<b>Net Score:</b>	<b>+5</b>
<b>Project Owner's Conclusion in PSF:</b>	The Project Owner confirms that the Project Activity will not cause any net harm to society.

## Section F. United Nations Sustainable Development Goals (SDG)

UN-level SDGs	UN-level Target	Declared Country-level SDG	Defining Project-level SDGs					Project Owner(s)'s Conclusion	
			Project-level SDGs	Project-level Targets/ Actions	Project-level Indicators	Contribution of Project-level Actions to SDG Targets	Monitoring	Explanation of Conclusion	Are Goal/ Targets Likely to be Achieved?
<p><b>Describe UN SDG targets and indicators</b> See: <a href="https://unstats.un.org/sdgs/indicators/indicators-list/">https://unstats.un.org/sdgs/indicators/indicators-list/</a></p>	<p>Describe the UN-level target(s) and corresponding indicator no(s)</p>	<p>Has the host country declared the SDG to be a national priority? Indicate Yes or No</p>	<p>Define project-level SDGs by suitably modifying and customizing UN/ Country-level SDGs to the project scope. <b>For guidance see:</b> Integrating the SDGs into Corporate Reporting- A Practical Guide: <a href="https://www.unglobalcompact.org/docs/publications/Practical_Guide_SDG_Reporting.pdf">https://www.unglobalcompact.org/docs/publications/Practical_Guide_SDG_Reporting.pdf</a> Case-study from Coca-Cola and other organizations to develop organization-wide SDGs (page 114): <a href="https://pub.iges.or.jp/pub/realising-transformative-potential-sdgs">https://pub.iges.or.jp/pub/realising-transformative-potential-sdgs</a></p>	<p>Define project-level targets/actions, by suitably modifying and customizing UN/Country-level targets to the project scope. Define the target date by which the Project Activity is expected to achieve the project-level SDG target(s). Refer to the previous column for guidance</p>	<p>Define project-level indicators by suitably modifying and customizing UN/Country-level indicators to the project scope or creating a new indicator(s). Refer to the previous column for guidance</p>	<p>Describe and justify how actions taken under the Project Activity are likely to result in a direct positive effect that contributes to achieving the defined project-level SDG targets and is additional to what would have occurred in the absence of the Project Activity</p>	<p>Describe the monitoring approach and the monitoring parameters to be applied for each project-level SDG target and Indicator</p>	<p>Describe how the Project Owner has concluded that the project is likely to achieve the identified Project level SDGs target(s).</p>	<p>Describe whether the project-level SDG target(s) is likely to be achieved by the target date (Yes or No)</p>
<p><b>Goal 1: End poverty in all its forms everywhere</b></p>	-	-	-	-	-	-	-	-	-
<p><b>Goal 2: End hunger, achieve food security and improved nutrition and promote sustainable agriculture</b></p>	-	-	-	-	-	-	-	-	-
<p><b>Goal 3. Ensure healthy lives and</b></p>	-	-	-	-	-	-	-	-	-



promote well-being for all at all ages									
Goal 4. Ensure inclusive and equitable quality education and promote lifelong learning opportunities for all	-	-	-	-	-	-	-	-	-
Goal 5. Achieve gender equality and empower all women and girls	-	-	-	-	-	-	-	-	-
Goal 6. Ensure availability and sustainable management of water and sanitation for all	-	-	-	-	-	-	-	-	-
Goal 7. Ensure access to affordable, reliable, sustainable and modern energy for all	SDG Target 7.2 “By 2030, increase substantially the share of renewable energy in the global energy mix” by the utilization of wind as a renewable energy source.”  Indicator 7.2.1 Renewable energy share in the total final energy consumption	Yes	The project level SDGS will be mapped by assessing the total capacity of renewable based power generation unit added and expected generation of clean energy. Addition of renewable energy capacity as a part of the project activity will help in increasing the share of renewable in country’s generation mix. The project activity includes installation LFG based power generation unit that will deliver zero emission electricity to the national grid annually. Quantity of net electricity supplied to the grid by project activity in year will replace equivalent amount of electricity feed to the grid by fossil fuel-based power plant and increase renewable energy share in the total final energy consumption.	Renewable based capacity addition and quantum of clean energy generated (expected generation of 108,955 MWh of clean energy per year) and fed to the grid which will increase the share of renewable.	7.2.1 Renewable energy generated and will increase the share in the total final energy consumption	The clean energy generated from the project activity and supplied to the grid over a period y will result in increasing the renewable energy share in total grid energy consumption	The electricity supplied to the grid by the project activity will be monitored continuously through electricity meters (main and check meter) installed at the sub-station. The meters remain under the custody of state utility. The electricity generation data will be collected through meter reading forms or electricity sales invoices. Please refer to Section B.7.1 for monitoring details	The project is already generating electricity using renewable energy resources that are fed to the national grid. Feeding of renewable based electricity to the grid is likely to enhance the share of renewable energy in final energy consumption and therefore the project activity is most likely	Yes

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								to achieve the project level SDG target.	
<b>Goal 8. Promote sustained, inclusive and sustainable economic growth, full and productive employment and decent work for all</b>	<p>Target : SDG target 8.5 By 2030, achieve full and productive employment and decent work for all women and men, including for young people and persons with disabilities, and equal pay for work of equal value</p> <p><b>Indicator</b> Unemployment rate, by sex, age and persons with disabilities</p>	Yes	Number of persons employed as a part of project activity by sex, age and persons with disabilities	Around 5 numbers of persons will be employed within the crediting period.	Total number of persons employed as part of project activity resulting in reduction of unemployment in line with UN-SDG indicator 8.5.2. Unemployment rate, by sex, age and persons with disabilities	Employment under the project activity has resulted in reduction of Proportion of not in employment (Indicator 8.5.1)	The total number of persons employed will be asessed from the SSI records of the Organisation (Social Security Institution of Turkey) on an annual basis. Please refer to Section B.7.1 for monitoring details	The project activity has already resulted in employment of youth and is evident from SSI record and therefore the project activity is most likely to achieve the project level SDG target.	Yes
<b>Goal 9. Build resilient infrastructure, promote inclusive and sustainable industrialization and foster innovation</b>	<p>Target SDG Target 9.4 By 2030, upgrade infrastructure and retrofit industries to make them sustainable, with increased resource-use efficiency and greater adoption of clean and environmentally sound technologies and industrial processes, with all countries taking action in accordance with their respective capabilities</p> <p>Indicator 9.4.1 CO<sub>2</sub> emission per</p>	Yes	Quantum of GHG emission avoidance due to the supply of clean energy to the grid thereby reducing the emission intensity of grid electricity resulting in reduction of CO <sub>2</sub> emissions per unit of value added	Emission avoidance through supply of green energy thereby avoiding generation of electricity in fossil fuel-based power plant. The project activity is likely to result in annual CO <sub>2</sub> equivalent emission avoidance of 62,164 tCO <sub>2</sub>	GHG emission avoidance due to feeding of clean electricity generated from the project activity to the grid	The project activity through feeding of clean energy will result in reduction of emission intensity of the grid power which in turn will reduce CO <sub>2</sub> emission per unit of value added thereby complying to indicator 9.4.1	Quantum of GHG emission avoidance will be estimated as product of clean energy generated and grid emission factor. Please refer to Section B.7.1 for monitoring details	The project is in operation and is generating clean energy which is supplied to the grid and is therefore resulting in avoidance of GHG emission and therefore the project activity is most	Yes

	unit of value added							likely to achieve the project level SDG target.	
<b>Goal 10. Reduce inequality within and among countries</b>	-	-	-	-	-	-	-	-	-
<b>Goal 11. Make cities and human settlements inclusive, safe, resilient and sustainable</b>	<p>Target SDG Target 11.6 By 2030, reduce the adverse per capita environmental impact of cities, including by paying special attention to air quality and municipal and other waste management</p> <p>Indicator 11.6.1 Proportion of municipal solid waste collected and managed in controlled facilities out of total municipal waste generated, by cities</p>	Yes	Quantum of municipal solid waste collected and disposed to the land fill. Collection of waste will enhance the Proportion of municipal solid waste collected and managed in controlled facilities out of total municipal waste generated, by cities.	The project activity is expected to result in collection of 2,247 tons of waste/day (average of the crediting period)	Quantum of municipal solid waste collected and disposed in the landfill	Collection and disposal of municipal solid waste as a part of the project activity will result in increase of proportion of municipal solid waste collected and managed in controlled facilities out of total municipal waste generated, by cities.	Quantum of solid waste collected and disposed in the landfill will be monitored. Please refer to Section B.7.1 for monitoring details .	The landfilling operation is in place and the project activity has resulted in collection and management of waste thereby contributing to the SDG indicator of increasing the proportion of waste collected and managed and therefore the project activity is most likely to achieve the project level SDG target.	Yes
<b>Goal 12. Ensure sustainable consumption and production patterns</b>	-	-	-	-	-	-	-	-	-
<b>Goal 13. Take urgent action to combat</b>	Target SDG Target 13.2 Integrate	Yes	Avoidance of GHG emission reductions per year	The project activity is	Quantum of GHG	Project activity results in	Monitoring of avoidance of GHG	The project	Yes

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<p><b>climate change and its impacts</b></p>	<p>climate change measures into national policies, strategies and planning.</p> <p>Indicator 13.2.2: Total greenhouse gas emission per year.</p>			<p>expected to result in avoidance of 91,153 tCO<sub>2</sub>e per annum.</p>	<p>avoided due to the project activity</p>	<p>avoidance of GHG emission by capturing and using of LFG for power generation which would otherwise being released to the atmosphere. The project through generation and supply of renewable electricity to the grid will avoid generation of equivalent quantum of grid electricity from fossil fuel-based power plant.</p>	<p>emission is estimated based on the monitoring of electricity generated and supplied to the grid as well as quantum of methane (LFG) captured and utilized for power generation. Please refer to Section B.7.1 for monitoring details.</p>	<p>activity has already resulted in capture and utilization of LFG for power generation and supply the generated power to the grid therefore the project activity is most likely to achieve the project level SDG target. Project activity is already installed in 2020 and is in operation.</p>	
<p><b>Goal 14. Conserve and sustainably use the oceans, seas and marine resources for sustainable development</b></p>	<p>-</p>	<p>-</p>	<p>-</p>	<p>-</p>	<p>-</p>	<p>-</p>	<p>-</p>	<p>-</p>	<p>-</p>
<p><b>Goal 15. Protect, restore and promote sustainable use of terrestrial ecosystems, sustainably manage forests, combat desertification, and halt and reverse land degradation and halt biodiversity loss</b></p>	<p>-</p>	<p>-</p>	<p>-</p>	<p>-</p>	<p>-</p>	<p>-</p>	<p>-</p>	<p>-</p>	<p>-</p>

Goal 16. Promote peaceful and inclusive societies for sustainable development, provide access to justice for all and build effective, accountable and inclusive institutions at all levels	-	-	-	-	-	-	-	-	-
Goal 17. Strengthen the means of implementation and revitalize the global partnership for sustainable development	-	-	-	-	-	-	-	-	-
<b>SUMMARY</b>						<b>Targeted</b>		<b>Likely to be Achieved</b>	
Total Number of SDGs						5		5	
Certification label (Bronze, Silver, Gold, Platinum, or Diamond) for the ACCs as defined in the PSF						Platinum		Platinum	

## Section G. Local stakeholder consultation

### G.1. Modalities for local stakeholder consultation

Local stakeholder consultation has been carried out on 27/01/2022 with the objective of obtaining view of the project stakeholders about the planned project including their feedbacks, and concerns. The Local Stakeholder consultation details are given as below:

Stakeholders identified	Mode of invitation	Mode of Comments receipt
Stakeholders includes – 1. Villagers and community leaders of the vicinity 2. Local labors 3. Local government agencies 4. Enterprenuers	Through notice to head of the village and invitation (emails) to identified stakeholders	1. Suggestion in grievance register 2. Structured feedback form 3. Verbal communication that is being minute 4. Provision for receipt of communication via emails

Stakeholder engagement procedure was being conducted at the Yenikent Landfill Gas to Electricity Plant with the local stakeholders and the heads of the Mustafa Kemal, Tatlar and Çoğlu Villages. The meeting started with opening speech by representative of project owner. She introduced all guests on dais. The representative of project owner explained how climate change occurs, what actions should be taken to prevent it and renewable energy basics. Further, she explained the technical aspects of project activity along with the harms of greenhouses gases especially methane, and how the project activity reduces the methane emissions and odor. The presentation continued with the comparison of unmanaged landfill sites and sanitary landfill. Then, the representative elaborated about carbon mechanism and its requirement for the current project. He introduced the UN-SDGs to stakeholders, indicators of SDGs and connection of these indicators with the project activity. The indicators include air quality, water quality, soil quality, odor, noise, and biodiversity which are stood for E+ impacts; employment quality and quantity, impact on poverty, access of economical and clean energy services and capacity of humanistic & corporative capacity which are stood for S+ impacts. The representative opened discussion regarding to these indicators with stakeholders and answered the uncertainties in stakeholders' minds. After the detailed discussions, the session was open for comments and suggestions from stakeholders. The stakeholder consultation meeting can be seen in Figure 3.



**Figure 3: Stakeholder Consultation Photographs**

The contact information of Company Executive of the company was given to mukhtars (head of the village) of Mustafa Kemal, Tatlar and Çoğlu Villages so that the local stakeholders will be able to reach company executive whenever they have any complaints, suggestions, or ideas about the project. Head of the village is the main contact person between the project owner and the local stakeholders, and makes sure that there is continuous communication between the two parties. Moreover, grievance register/logbook was delivered to the heads of Villages. This logbook will be checked in the next verifications to see whether there have been any complaints from the local stakeholders.

Project representatives explained the project benefits and how project can help to fight against climate change and no negative comments received during the local stakeholder round. The commenting sheet from LSH, invitation letter receipt copy was submitted to the DOE for further check. Few queries raised during local stakeholder consultation are addressed satisfactorily.

## G.2. Summary of comments received

Information about the participants of the stakeholder meeting and their comments are tabulated below.

Information About the Participant			Questionnaire			
Name Surname	Profession	Gender (M/F)	How did they hear about the meeting?	Was the information given about the project enough? (Y/N)	Was the information about Grievance Resolution Mechanism enough? (Y/N)	Comments on the environmental or social effects of the project

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Talat Balabanoğlu	Head of the Mustafa Kemal Village	M	Other	Y	Y	Contributions to our country is always good, thank you.
Yakup Çiçek	Driver	M	Notice	Y	Y	I found the factory beneficial. I don't think there is any harm done to the environment.
Neslihan Bütün	Tourism Guide	F	Notice	Y	Y	I think the environmental and social impact of the project as positive. I do not have any discomfort with the fact that the factory is in the Yenikent region.
Yakup Kaya	Self-employment	M	Notice	Y	Y	No comment
Kemal Güröz	The Head of Çoğlu Village	M	Notice	Y	Y	No comment
Yalçın Topaloğlu	Tradesman	M	Other	Y	Y	No comment
Hüseyin Dönmez	Tradesman	M	Other	Y	Y	No comment
Ahmet Güröz	Tradesman	M	Other	Y	Y	No comment
Emin İrkin	Driver	M	Other	Y	Y	No comment
Sebahattin Bütün	Driver	M	Other	Y	Y	Project activity contributes to recycling, national economy and employment. The streets are cleaned from waste and this activity contributes positively to the benefit of humanity.
Aslan Polat	Driver	M	Other	Y	Y	I wish you continued success.
Ercan Akpınar	Driver	M	Notice	Y	Y	I think that the project activity is beneficial in preventing environmental pollution and global warming.



Mehmet Akpınar	Driver	M	Notice	Y	Y	No comment
Filiz Erkol	Tourism Secretariat	F	Notice	Y	Y	I think the environmental and social impact of the project as positive. I do not have any discomfort with the fact that the factory is in the Yenikent region.
Yıldırım Şimşek	Officer	M	Notice	Y	Y	No comment

The majority of the participants is from nearby villages but also there are participants from healthcare sector and TEMA Foundation. Participants are curious about how waste turns into electricity and very much grateful that their waste is turning into energy and do not get wasted. They appreciate the given information regarding to the climate change and operation of the facility.

### G.3. Consideration of comments received

All the above queries have been suitably and satisfactorily replied / clarified by project participant's representatives. There were no major comments or protest raised by the stakeholders and they were in support for setting up of these kinds of projects in the region.

## Section H. Approval and authorization

Not Applicable.

## Appendix 1. Contact information of project owners

<b>Organization name</b>	ITC-KA Enerji Üretim Sanayi ve Ticaret A.Ş.
<b>Country</b>	Turkey
<b>Address</b>	Yukarı İmrohor Mah. Natoyolu Cad. İdari Bina No: 190 G Mamak/Ankara
<b>Telephone</b>	(0312) 390 87 01
<b>Fax</b>	(0 312) 390 96 73
<b>E-mail</b>	<a href="mailto:info@itcturkiye.com">info@itcturkiye.com</a>
<b>Website</b>	<a href="http://www.itcturkiye.com/en">http://www.itcturkiye.com/en</a>
<b>Contact person</b>	<b>Mr. Ali Kantur</b>

<b>Organization name</b>	EKI Energy Services Limited
<b>Country</b>	India
<b>Address</b>	EnKing Embassy, Plot 48, Scheme 78 Part-2, Behind Vrindavan Hotel, Vijay Nagar, Indore-452010
<b>Telephone</b>	+91-9907534900
<b>Fax</b>	+91-0731-4289086
<b>E-mail</b>	<a href="mailto:manish@enkingint.org">manish@enkingint.org</a>
<b>Website</b>	<a href="http://www.enkingint.org">www.enkingint.org</a>
<b>Contact person</b>	<b>Mr. Manish Dabkara</b>

## Appendix 2. Affirmation regarding public funding

ITC-KA Enerji Üretim Sanayi ve Ticaret A.Ş. confirms that there would be no divergence of Official Development Assistance (ODA) in any of the project activity. This is confirmed through undertaking / declaration from the project owner.

## Appendix 3. Applicability of methodology(ies)

Refer to section B.6.1.

## Appendix 4. Further background information on ex ante calculation of emission reductions

Refer to section B.6.2.

## Appendix 5. Further background information on monitoring plan

Refer to section B.7.

## Appendix 6. Summary report of comments received from local stakeholders

## Appendix 7. Summary of de-registered CDM project (Type B)

>>

<i>Complete this form in accordance with the instructions attached at the end of this form.</i>	
<b>CDM Project registration number</b>	
<b>Date of registration of CDM Project</b>	
<b>Title of the Project Activity</b>	
<b>CDM Project de-registration reference number</b>	
<b>Date of de-registration of the CDM Project</b>	
<b>Project Participants</b> (authorized by the host / annex 1 country letter of approval)	
<b>Country where the project is located</b>	

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<p><b>Applied CDM methodology(ies)</b> (provide reference and version number(s))</p>				
<p><b>Pre-registration changes to the CDM Project Activity</b> (Tick as applicable)</p>	<p><b>CDM Pre-registration Changes</b></p>	<p><b>Reference number</b></p>	<p><b>Approved</b></p>	<p><b>Provide a summary of pre-registration changes</b></p>
	<p>Deviations from the CDM methodology</p>		<p><input type="checkbox"/></p>	
	<p>Deviations from the CDM Tool</p>		<p><input type="checkbox"/></p>	
	<p>Deviations from the CDM rules</p>		<p><input type="checkbox"/></p>	
	<p>Other.....</p>		<p><input type="checkbox"/></p>	

**Post-registration changes to the CDM Project Activity**  
(Tick as applicable)

CDM Post registration Changes	Reference number	Approved	Provide a summary of post-registration changes
Change in project design		<input type="checkbox"/>	
Request for revision of monitoring plan		<input type="checkbox"/>	
Request for change in start date of crediting period		<input type="checkbox"/>	
Renewal of crediting period		<input type="checkbox"/>	
Temporary deviations		<input type="checkbox"/>	
Other.....		<input type="checkbox"/>	

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Crediting Period(s)	Crediting period(s)		Period (start & end dates)	ERs as per registered PDD/MR	CERs issued	
	Crediting Period (shall start on or after 1 Jan 2016)	Fixed 10 year				
		Renewable (7 years, with 2 approved renewals)	1 <sup>st</sup>			
			2 <sup>nd</sup>			
			3 <sup>rd</sup>			
	Period for which CERs have been issued					
	Period for which CERs have been requested but not issued					-
	Period for which CERs have never been requested for issuance (no monitoring reports submitted)					-
Period for which CERs have never been requested for issuance prior to CDM de- registration					-	
Remaining Crediting period, after CDM de-registration, for which CERs have not been issued by the UNFCCC CDM Executive Board, subject to a ceiling of 10 years as allowed under the GCC Program					-	

<b>Details of Previous CDM Issuance Requests</b>	<b>Issuance Request</b>	<b>Period</b> (start & end dates)	<b>ERs as per registered PDD</b>	<b>Quantity of CERs requested to be issued</b>	<b>Quantity of CERs issued</b>
	1 <sup>st</sup>				
	2 <sup>nd</sup>				
	3 <sup>rd</sup>				
	4 <sup>th</sup>				
	5 <sup>th</sup>				
	Add rows .....				
	<b>Total</b>				
<b>List any open issues in the Validation and last Verification Report (e.g., FARs, if any) and how they have been addressed</b>					
<b>Any other relevant information that has not been reported in the registered CDM documents and that may have adverse impacts on the environmental integrity of the Project Activity</b>					
<b>Provide the list of all the registered documents related to this project, as available on the UNFCCC/CDM website and the corresponding URLs.</b>					

## DOCUMENT HISTORY

Version	Date	Comment
V 3.2	31/12/2020	<ul style="list-style-type: none"> <li>▪ The name of GCC Program’s emission units has been changed from “Approved Carbon Reductions” or ACRs to “Approved Carbon Credits” or ACCs.</li> </ul>
V 3.1	17/08/2020	<ul style="list-style-type: none"> <li>▪ Editorial revisions made               <ul style="list-style-type: none"> <li>○ Revised Table in section B.7.2 on Monitoring-program of risk management actions</li> <li>○ Revised Table in section E.1 on Environmental Safeguards</li> <li>○ Revised Table in section E.1 on Social Safeguards</li> <li>○ Revised Table in section F on United Nations Sustainable Development Goals (SDG)</li> </ul> </li> </ul>
V 3.0	05/07/2020	<ul style="list-style-type: none"> <li>▪ Revised version released on approval by Steering Committee as per GCC Program Process;</li> <li>▪ Revised version contains following changes:               <ul style="list-style-type: none"> <li>○ Change of name from Global Carbon Trust (GCT) to Global Carbon Council (GCC);</li> <li>○ Considered and addressed comments raised by Steering Committee:                   <ul style="list-style-type: none"> <li>➤ during physical meeting (SCM 01, dated 29 Oct 2019, Doha Qatar); and</li> <li>➤ electronic consultations EC01-Round 01 (15.09.2019 – 25.09.2019), EC01-Round 02 (27.03.2020 – 27.06.2020).</li> </ul> </li> <li>○ Feedback from Technical Advisory Board (TAB) of ICAO on GCC submission for approval under CORSIA<sup>57</sup>;</li> </ul> </li> </ul>
V 2.0	25/06/2019	<ul style="list-style-type: none"> <li>▪ Revised version released for approval by the GCC Steering Committee.</li> <li>▪ Revised version includes additional details and instructions on the information to be provided, consequent to the latest developments world-wide (e.g., CORSIA EUC).</li> </ul>
V 1.0	01/11/2016	Initial version released under the GCC Program Version 1

<sup>57</sup>See ICAO recommendation for conditional approval of GCC at [https://www.icao.int/environmental-protection/CORSIA/Documents/TAB/Excerpt\\_TAB\\_Report\\_Jan\\_2020\\_final.pdf](https://www.icao.int/environmental-protection/CORSIA/Documents/TAB/Excerpt_TAB_Report_Jan_2020_final.pdf)



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