

Gold Standard for the Global Goals
Transition Annex
*(To be used by all GS CDM/VER stand alone projects and PoAs, Micro
Scale stand alone projects and Micro PoAs)*



Version 1 – September 2017

Gold Standard®

KEY PROJECT INFORMATION

Title of Project/PoA/Activity:	Bolu Landfill Gas to Energy Project, Turkey
GS ID of the project/PoA/activity:	GS 764 ¹
GS Version:	V 2.0
Brief description of Project:	The Bolu Landfill Gas to Energy Project, developed and operated by CEV Marmara Enerji Üretim San. Ve Tic. Ltd. Şti., which is the regional office of the Korea-based company CEV Clean Energy & Vehicle. The project activity involves the collection and utilization of the LFG with an electricity component with a maximum installed capacity reaching 1.131 MWe. The location of the project activity is the Bolu landfill site, Turkey. The Bolu landfill is the main landfill of the Bolu city, which has more than 150,000 inhabitants. It started operations in 1992 and its official operation in 1994. The landfill currently holds more than 2 million tons of waste. In 2008, the disposed waste amount reached 42,926 tones, corresponding to 160-180 t/day on average.
Project type: Energy/Land Use	Energy
For Renewable Energy Projects – intention to apply RECs Labels (y/n)	No
GS Stream (CDM/VER):	VER
Scale (large/scale/micro):	Small Scale
GS Registration Date:	12/08/2011
GS Crediting period start date:	1 st crediting period: 12/08/2011 2 nd crediting period: 12/08/2018
CDM Registration Date:	-
CDM Crediting period start date:	-
Project Developer:	CEV Enerji Üretim Sanayi ve Ticaret Limited Şirketi
Project Representative:	EKI Energy Services Limited
Project Participants and any communities involved:	1 - CEV Marmara Enerji Üretim San. Ve Tic. Ltd. Şti. 2 - EKI Energy Services Limited
Host Country/Location:	Turkey
Methodologies applied:	AMS-I.D. "Grid connected renewable electricity generation" (Version 18.0 ²) AMS-III.G version 06
SDG Impacts:	1 – SDG 7 Affordable and Clean Energy 2 – SDG 8 Decent Work and Economic Growth 3 – SDG 13 Climate Action
Estimated amount of SDG Impact (GSVERs and others)	1– SDG 7: Affordable and Clean Energy- 8,400 MWh of clean energy per annum. 2 – SDG 8: Decent Work and Economic Growth: The project provides employment to around 5 to 6 people and minimum 1 Training per year. 3 – SDG 13: 28,057 tCO ₂ e per annum

¹ <https://registry.goldstandard.org/projects/details/1179>

² https://cdm.unfccc.int/filestorage/2/P/7/2P7FS6ZQAR84LG3NMKYUH50WI9ODBC/EB81_repan24_AMS-I.D_ver18.pdf?t=a258cXBkdnNlfDAOHQFgUJ_XzE-r7mrXG7Ta

SECTION A Sustainable Development Goals (SDG) outcomes

A.1 Relevant target for each of the three SDGs

SDG	Target	Indicator
13 (Climate Action)	13.3 Improve education, awareness-raising and human and institutional capacity on climate change mitigation, adaptation, impact reduction and early warning	13.3.2 Number of countries that have communicated the strengthening of institutional, Systemic and individual capacity-building to implement adaptation, mitigation and technology transfer, and development actions
8 (Decent Work and Economic Growth)	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	8.5.2. Unemployment rate, by sex, age and persons with disabilities
7 (Affordable and Clean Energy)	7.2. By 2030, increase substantially the share of renewable energy in the global energy mix	7.2.1 Renewable energy share in the total final energy consumption

A.2 Explanation of methodological choices/approaches for estimating the SDG outcome

SDG Goal	Methodological choices/approaches for estimating the SDG outcome
SDG 7 – Affordable and Clean Energy: Ensure access to affordable, reliable, sustainable and modern energy for all	Measurement Method: - Electricity produced and utilized for sell to national grid is monitored through energy meter. Net electricity will be calculated by state electricity board and O&M operator on monthly basis and provided in the share certificate/monthly report or equivalent. The other parameters used for net electricity supplied to grid are mentioned in monitoring plan. QA/QC Process: This parameter is monitored monthly and value of parameter will be cross checked with invoices. The meters will be calibrated on regular frequency.
SDG 8 – Decent Work and Economic Growth: Promote inclusive and sustainable economic growth, employment and decent work for all	Measurement Method: - Employment generation is monitored through staff register for employment details or HR records QA/QC Process: This parameter is based on records, data and no any QA/QC procedure required. The DOE can confirm this parameter with interview with PP or Site in charge or employees for training and employment generation.
SDG 13 – Climate Action: Take urgent action to combat climate change and its impacts	Measurement Method: - The emission reductions achieved will be the product of net electricity generated and the grid emission factor. Electricity generation volume will be checked by EPIAŞ monthly readings whereas TEİAŞ monthly reading reports will be employed for cross-checking purpose. The baseline emissions resulting from electricity generation are calculated based on the amount of electricity generated and delivered to the grid by the project activity and the corresponding emissions resulting from the production of this amount of electricity by the Turkish grid. The baseline emissions under this monitoring period include the methane from the existing waste destroyed by the project activity and the baseline emissions from electricity generated utilising the LFG. The baseline emissions are calculated as follows in line with the registered PDD: $BE_Y = (MD_{project,y} - MD_{BL}) * GWP_{CH4} + EL_{LFG} * CEF_{elec}$ QA/QC Process: This parameter is calculated, and no any QA/QC procedure required.

A.3 Data and parameters fixed ex ante for monitoring contribution to each of the three SDGs

Relevant SDG Indicator	13.3.2 Number of countries that have communicated the strengthening of institutional, Systemic and individual capacity-building to implement adaptation, mitigation and technologytransfer, and development actions
Data / Parameter	OX
Unit	Dimensionless
Description	Fraction of methane that would be oxidized in the top layer of the SWDS in the baseline
Source of data	AMS-III.G
Value(s) applied	0.1
Choice of data or Measurement methods and procedures	As referred under AMS-III.G
Purpose of data	Calculation of baseline emissions
Additional comment	n.a.

Relevant SDG Indicator	13.3.2 Number of countries that have communicated the strengthening of institutional, Systemic and individual capacity-building to implement adaptation, mitigation and technologytransfer, and development actions
Data / Parameter	GWP_{CH4}
Unit	tCO ₂ e/tCH ₄
Description	Global Warming Potential of CH ₄
Source of data	IPCC
Value(s) applied	25 for the second commitment period. Shall be updated accordingly to any future COP/MOP decision.
Choice of data or Measurement methods and procedures	As referred under AMS-III.G
Purpose of data	Calculation of baseline emission
Additional comment	n.a.

Relevant SDG Indicator	13.3.2 Number of countries that have communicated the strengthening of institutional, Systemic and individual capacity-building to implement adaptation, mitigation and technologytransfer, and development actions
Data / Parameter	npj
Unit	%
Description	Efficiency of the LFG capture system that will be installed in the project activity
Source of data	AMS-III.G
Value(s) applied	70%
Choice of data or Measurement methods and procedures	Default value under AMS-III.G
Purpose of data	Calculation of baseline emissions
Additional comment	Only applicable to ex-ante estimations of the baseline emissions. The efficiency factor is based on the observations on actual performance of the power plant.

Relevant SDG Indicator	13.3.2 Number of countries that have communicated the strengthening of institutional, Systemic and individual capacity-building to implement adaptation, mitigation and technologytransfer, and development actions
Data / Parameter	D_{CH4}
Unit	Tonnes/m ³
Description	Density of methane under normal conditions.
Source of data	IPCC Volume 2 Energy
Value(s) applied	0.67 kg/m ³ ³
Choice of data or Measurement methods and procedures	As referred under AMS-III.G
Purpose of data	Calculation of baseline emissions
Additional comment	

Relevant SDG Indicator	13.3.2 Number of countries that have communicated the strengthening of institutional, Systemic and individual capacity-building to implement adaptation, mitigation and technologytransfer, and development actions
Data / Parameter	φ default
Unit	-
Description	Default value for the model correction factor to account for model uncertainties
Source of data	Emissions from solid disposal sites
Value(s) applied	0.75
Choice of data or Measurement methods and procedures	As referred under “Emissions from solid disposal sites”
Purpose of data	Calculation of baseline emissions
Additional comment	The proposed project activity falls under Application A

Relevant SDG Indicator	13.3.2 Number of countries that have communicated the strengthening of institutional, Systemic and individual capacity-building to implement adaptation, mitigation and technologytransfer, and development actions
Data / Parameter	F
Unit	-
Description	Fraction of methane in the SWDS gas (volume fraction)
Source of data	IPCC 2006 Guidelines for National Greenhouse Gas Inventories
Value(s) applied	0.5
Choice of data or Measurement methods and procedures	Emissions from solid disposal sites
Purpose of data	Calculation of baseline emissions
Additional comment	Upon biodegradation, organic material is converted to a mixture of methane and carbon dioxide

Relevant SDG Indicator	13.3.2 Number of countries that have communicated the strengthening of institutional, Systemic and individual capacity-building to implement adaptation, mitigation and technologytransfer, and development actions
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³ http://www.ipcc-nggip.iges.or.jp/public/2006gl/pdf/2_Volume2/V2_4_Ch4_Fugitive_Emissions.pdf page 4.12 page 4.12

Data / Parameter	DOC_{f,default}
Unit	Weight fraction
Description	Default value for the fraction of degradable organic carbon (DOC) in MSW that can decompose in the SWDS
Source of data	IPCC 2006 Guidelines for National Greenhouse Gas Inventories
Value(s) applied	0.5
Choice of data or Measurement methods and procedures	Emissions from solid disposal sites
Purpose of data	Calculation of baseline emissions
Additional comment	The proposed project activity falls under Application A

Relevant SDG Indicator	13.3.2 Number of countries that have communicated the strengthening of institutional, Systemic and individual capacity-building to implement adaptation, mitigation and technologytransfer, and development actions
Data / Parameter	MCF_{default}
Unit	-
Description	Methane correction factor
Source of data	IPCC 2006 Guidelines for National Greenhouse Gas Inventories
Value(s) applied	0.8
Choice of data or Measurement methods and procedures	Emissions from solid disposal sites
Purpose of data	Calculation of baseline emissions
Additional comment	The baseline falls under the definition “unmanaged solid waste disposal site-deep”

Relevant SDG Indicator	13.3.2 Number of countries that have communicated the strengthening of institutional, Systemic and individual capacity-building to implement adaptation, mitigation and technologytransfer, and development actions														
Data / Parameter	DOC_i														
Unit	-														
Description	Fraction of degradable organic carbon in waste type j (weight fraction)														
Source of data	IPCC 2006 Guidelines for National Greenhouse Gas Inventories (adapted from Volume 5, Table 2.4 and Table 2.5)														
Value(s) applied	The following values for the different waste types have been applied: <table border="1"> <thead> <tr> <th>Waste type j</th><th>DOC_i (% 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</td><td>20</td></tr> <tr> <td>Glass, plastic, metal, other inert</td><td>0</td></tr> </tbody> </table>	Waste type j	DOC _i (% 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	Glass, plastic, metal, other inert	0
Waste type j	DOC _i (% 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														
Glass, plastic, metal, other inert	0														
Choice of data or Measurement methods and procedures	Emissions from solid disposal sites														
Purpose of data	Calculation of baseline emissions														

Additional comment	-
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Relevant SDG Indicator	13.3.2 Number of countries that have communicated the strengthening of institutional, Systemic and individual capacity-building to implement adaptation, mitigation and technologytransfer, and development actions																	
Data / Parameter	k_i																	
Unit	1/yr																	
Description	Decay rate for the waste type j																	
Source of data	IPCC 2006 Guidelines for National Greenhouse Gas Inventories (Volume 5, Table 3.3)																	
Value(s) applied	The following values for the different waste types have been applied: <table><tr><th colspan="2" rowspan="2">Waste type j</th><th>Boreal and Temperate (MAT < 200C)</th></tr><tr><th>WET(MAP/PET <1)</th></tr><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></table>			Waste type j		Boreal and Temperate (MAT < 200C)	WET(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 < 200C)																
		WET(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																
Choice of data or Measurement methods and procedures	Emissions from solid disposal sites																	
Purpose of data	Calculation of baseline emissions																	
Additional comment																		

Relevant SDG Indicator	13.3.2 Number of countries that have communicated the strengthening of institutional, Systemic and individual capacity-building to implement adaptation, mitigation and technologytransfer, and development actions		
Data / Parameter	$EG_{m,y}$		
Unit	MWh		
Description	Net electricity generated by power plant/unit m		
Source of data	TEIAS (Turkish Electricity Transmission Company) https://www.teias.gov.tr/tr/turkiye-elektrik-uretim-iletim-istatistikleri/2015		
Value(s) applied	Please refer to Section B.6.3 table 9		

Choice of data or Measurement methods and procedures	According to “Turkish Statistics Law and Official Statistics Program” ⁴ TEİAŞ, the Turkish Electricity Transmission Company is the official source for the related data, hence providing the most up-to-date and accurate information available.
Purpose of data	Used to calculate the combined margin emission factor
Additional comment	Since TEİAŞ provides gross amounts, a conversion factor has been applied derived from the total gross / net amount for the same year. (https://www.teias.gov.tr/tr/turkiye-elektrik-uretim-iletim-istatistikleri/2015)

Relevant SDG Indicator	13.3.2 Number of countries that have communicated the strengthening of institutional, Systemic and individual capacity-building to implement adaptation, mitigation and technologytransfer, and development actions
Data / Parameter	FC_{i,y}
Unit	tonnes (m ₃ for gaseous fuels)
Description	Amount of fossil fuel type i consumed in the project electricity system by generation sources in year y (2009-2011)
Source of data	TEİAŞ (Turkish Electricity Transmission Company) https://www.teias.gov.tr/tr-TR/turkiye-elektrik-uretim-iletim-istatistikleri
Value(s) applied	Please refer to Section B.6.3 table 9
Choice of data or Measurement methods and procedures	According to “Turkish Statistics Law and Official Statistics Program” TEİAŞ, the Turkish Electricity Transmission Company is the official source for the related data, hence providing the most up-to-date and accurate information available.
Purpose of data	Used to calculate the combined margin emission factor
Additional comment	-

Relevant SDG Indicator	13.3.2 Number of countries that have communicated the strengthening of institutional, Systemic and individual capacity-building to implement adaptation, mitigation and technologytransfer, and development actions
Data / Parameter	NCV_{i,y}
Unit	GJ/tonnes (m ₃ for gaseous fuels)
Description	Net calorific value (energy content) of fossil fuel type i in year y
Source of data	TEİAŞ (Turkish Electricity Transmission Company) https://www.teias.gov.tr/tr-TR/turkiye-elektrik-uretim-iletim-istatistikleri
Value(s) applied	Please refer to Section B.6.3 table 9
Choice of data or Measurement methods and procedures	According to “Turkish Statistics Law and Official Statistics Program” TEİAŞ, the Turkish Electricity Transmission Company is the official source for the related data, hence providing the most up-to-date and accurate information available.
Purpose of data	Used to calculate the combined margin emission factor
Additional comment	-

Relevant SDG Indicator	13.3.2 Number of countries that have communicated the strengthening of institutional, Systemic and individual capacity-building to implement adaptation, mitigation and technologytransfer, and development actions
Data / Parameter	EF_{CO₂,i,y}
Unit	tCO ₂ /GJ
Description	CO ₂ emission factor of fossil fuel type i” used in power unit min year y

⁴ TEİAŞ 2005: <http://rega.basbakanlik.gov.tr/Eskiler/2005/11/20051118-1.htm>

Source of data	IPCC default values at the lower limit of the uncertainty at a 95% confidence interval as provided in table 1.4 of Chapter 1 of Volume 2 (Energy) of the 2006 IPCC Guidelines for National Greenhouse Gas Inventory http://www.ipcc-nggip.iges.or.jp/public/2006gl/index.htm
Value(s) applied	Please refer to Section B.6.3 table 11
Choice of data or Measurement methods and procedures	There is no information on the fuel specific default emission factor in Turkey, hence, IPCC values has been used.
Purpose of data	Used to calculate the combined margin emission factor
Additional comment	-

Relevant SDG Indicator	13.3.2 Number of countries that have communicated the strengthening of institutional, Systemic and individual capacity-building to implement adaptation, mitigation and technologytransfer, and development actions											
Data / Parameter	n _{m,y}											
Unit	%											
Description	Average net energy conversion efficiency of power unit m in year y											
Source of data	“Tool to calculate the emission factor for an electricity system”,											
Value(s) applied	<table><tr><td></td><td>Average conversion efficiency $\eta_{m,y}$</td></tr><tr><td>Natural Gas</td><td>IPCC default value of 60% for combined cycle</td></tr><tr><td>Lignite</td><td>IPCC default value of 41.4% for PFBS</td></tr><tr><td>Coal</td><td>IPCC default value of 41.4% for PFBS</td></tr><tr><td>Fuel Oil</td><td>IPCC default value of 46% for combined cycle</td></tr></table>			Average conversion efficiency $\eta_{m,y}$	Natural Gas	IPCC default value of 60% for combined cycle	Lignite	IPCC default value of 41.4% for PFBS	Coal	IPCC default value of 41.4% for PFBS	Fuel Oil	IPCC default value of 46% for combined cycle
	Average conversion efficiency $\eta_{m,y}$											
Natural Gas	IPCC default value of 60% for combined cycle											
Lignite	IPCC default value of 41.4% for PFBS											
Coal	IPCC default value of 41.4% for PFBS											
Fuel Oil	IPCC default value of 46% for combined cycle											
Choice of data or Measurement methods and procedures	Default values have been used .											
Purpose of data	Used to calculate the combined margin emission factor											
Additional comment	Where available Plant specific efficiencies are used instead of default values where available. Please refer to emission reduction calculation sheet for more details.											

Relevant SDG Indicator	13.3.2 Number of countries that have communicated the strengthening of institutional, Systemic and individual capacity-building to implement adaptation, mitigation and technologytransfer, and development actions	
Data / Parameter	$F_{CH_4,BL,y}$	
Unit	tCH ₄	
Description	Methane emissions that would be captured and destroyed to comply with national or local safety requirements or legal regulations in the year y	
Source of data	National laws and regulations (http://mevzuat.basbakanlik.gov.tr)	
Value(s) applied	0	
Choice of data or Measurement methods and procedures	Fixed value has been applied	
Purpose of data	Calculation of baseline emissions	
Additional comment	N.A.	

Relevant SDG Indicator	13.3.2 Number of countries that have communicated the strengthening of institutional, Systemic and individual capacity-building to implement adaptation, mitigation and technologytransfer, and development actions
Data / Parameter	EE_y
Unit	%
Description	Energy Conversion Efficiency of the project equipment
Source of data	Applicable methodology
Value(s) applied	40%
Choice of data or Measurement methods and procedures	determined as 40% default.
Purpose of data	Calculation of baseline emissions
Additional comment	-

SECTION B Safeguarding Principles Assessment

B.1 Analysis of social, economic and environmental impacts

Assessment Questions/ Requirements	Justification of Relevance (Yes/potentially/no)	How Project will achieve Requirements through design, management or risk mitigation.	Mitigation Measures added to the Monitoring Plan (if required)
Principle 1. Human Rights			
1. The Project Developer and the Project shall respect internationally proclaimed human rights and shall not be complicit in violence or human rights abuses of any kind as defined in the Universal Declaration of Human Rights. 2. The Project shall not discriminate with regards to participation and inclusion.	1.Yes 2.Yes	The project respects internationally proclaimed human rights including dignity, cultural property. Turkey is a party to Universal Declaration of Human Rights: http://ua.mfa.gov.tr/detay.aspx?2634	Turkey is a party to the Universal Declaration of Human Rights, therefore does not violate these rights and it's not a matter of discussion for Turkey.
Principle 2. Gender Equality			
1. The Project shall not directly or indirectly lead to/contribute to adverse impacts on gender equality and/or the situation of women	1.Yes 2.Yes 3.Yes	The project does not involve in any form discrimination in any kind of form. Turkey is also party to Convention on Discrimination since 1967 to prevent any form of discrimination; http://ua.mfa.gov.tr/files.ashx?872	In the main office of the project owner company there are women employees as well. Therefore, project contributes to recognition of women rights implicitly.

2. Projects shall apply the principles of non-discrimination, equal treatment, and equal pay for equal work 3. The Project shall refer to the country's national gender strategy or equivalent national commitment to aid in assessing gender risks 4. (where required) Summary of opinions and recommendations of an Expert Stakeholder(s)			
Principle 3. Community Health, Safety and Working Conditions			
The Project shall avoid community exposure to increased health risks and shall not adversely affect the health of the workers and the community	1.No	All relevant environment, health and safety regulations will be applied as required and all necessary precautions are being taken.	N/A
Principle 4.1 Sites of Cultural and Historical Heritage			
Does the Project Area include sites, structures, or objects with historical, cultural, artistic, traditional or religious values or intangible forms of culture?	1.No	There is no cultural heritage on the site.	N/A
Principle 4.2 Forced Eviction and Displacement			
Does the Project require or cause the physical or economic relocation of peoples (temporary or permanent, full or partial)?	1.No	N/A	Not Applicable
Principle 4.3 Land Tenure and Other Rights			
1. Does the Project require any change, or have any uncertainties related to land tenure arrangements and/or access rights, usage	1.No	N/A	Not Applicable

rights or land ownership?			
Principle 4.4 Indigenous People			
The Gold Standard Certification requires that 3.4.12 The Project Developer shall identify all communities of Indigenous Peoples within the Project area of influence who may be affected directly or indirectly by the Project. 3.4.13 The Project Developer shall recognise and respect the indigenous people's collective rights to own, use, and develop and control the lands, resources and territories that they have traditionally owned, occupied or otherwise used or acquired, including lands and territories for which they do not yet possess title.	No	No indigenous people lived near the project site before the project implementation. The project is not creating any potential impact upon indigenous people hence not applicable.	
Principle 5. Corruption			
1. The Project shall not involve, be complicit in or inadvertently contribute to or reinforce corruption or corrupt Projects	1.Yes	The project does not involve any kind of corruption. Turkey is a party to United Nation Convention against Corruption since 2006; http://ua.mfa.gov.tr/detay.aspx?15042	Not Applicable
Principle 6.1 Labour Rights			
1. The Project Developer shall ensure that all employment is in compliance with national labour occupational health and safety laws and with the principles and standards embodied in the ILO fundamental conventions 2. Workers shall be able to establish and join labor organizations	1.Yes 2.Yes 3.Yes 4.Yes 5.Yes	Project owner protects labours rights of all employees within this company. Workers might have occupational accidents during construction and operation phase. According to project developer, during construction and operational phase of the project "Health and Occupational Safety Regulation" will be followed. Regulation could be found under this link too: http://www.mevzuat.gov.tr/MevzuatMetin/1.5.6331.pdf	Necessary health and safety measures will be taken during operation phase according to the regulation of health and safety requirements in construction Works (http://www.resmigazete.gov.tr/eskiler/2013/10/20131005-2.htm)., Additionally, relevant staff will be trained to be able to work with high voltages, high heights and heavy machineries.

3. Working agreements with all individual workers shall be documented and implemented and include: a) Working hours (must not exceed 48 hours per week on a regular basis), AND b) Duties and tasks, AND c) Remuneration (must include provision for payment of overtime), AND d) Modalities on health insurance, AND e) Modalities on termination of the contract with provision for voluntary resignation by employee, AND f) Provision for annual leave of not less than 10 days per year, not including sick and casual leave. 4. No child labor is allowed (Exceptions for children working on their families' property requires an Expert Stakeholder opinion) The Project Developer shall ensure the use of appropriate equipment, training of workers, documentation and reporting of accidents and incidents, and emergency preparedness and response measures			
Principle 6.2 Negative Economic Consequences			

Does the project cause negative economic consequences during and after project implementation?	No	The project provides job opportunities for local people. By this way, it contributes improvement of economy.	N/A
Principle 7.1 Emissions			
Will the Project increase greenhouse gas emissions over the Baseline Scenario?	No	On the contrary, it helps to reduce GHG emissions by producing green energy.	N/A
Principle 7.2 Energy Supply			
Will the Project use energy from a local grid or power supply (i.e., not connected to a national or regional grid) or fuel resource (such as wood, biomass) that provides for other local users?	Partially	Plant sometimes can use energy from local grid in emergency. However, this amount is really less when it is compared with its production of green energy amount.	N/A
Principle 8.1 Impact on Natural Water Patterns/Flows			
Will the Project affect the natural or pre-existing pattern of watercourses, groundwater and/or the watershed(s) such as high seasonal flow variability, flooding potential, lack of aquatic connectivity or water scarcity?	1.No	The project owner ensures the pattern of natural or pre-existing pattern of water courses or ground water is not affected due to the implementation of project activity. Further being a landfill project activity, leachate management is being done by means of lined landfills with leachate collection and storage systems. These systems typically include provisions for the drainage of leachate within the landfill and pumping the leachate to storage tanks. The stored leachate is then being pumped to the Bolu Municipality to a wastewater treatment plant.	
Principle 8.2 Erosion and/or Water Body Instability			
Could the Project directly or indirectly cause additional erosion and/or water body instability or disrupt the natural pattern of erosion?	1.No	The project is being implemented in a proper way (by considering the concerns indicated via the entire principle 4.2.2 Erosion and/or Water Body Instability): There is no interruption to the hydrological systems in case of landfill to energy projects. The power generated by the Project will result in reduction of cooling water discharged by thermal power plants. As opposed to the baseline practice, contamination of rainwater will be minimized by effectively covering the waste with impermeable materials.	N/A

		Even if some water leaches into the depths (which is necessary for methane generation), the impermeable landfill bottom will not allow leachate to escape and contaminate ground or underground waters. Leachate recovery is already being carried out .	
Principle 9.1 Landscape Modification and Soil			
Does the Project involve the use of land and soil for production of crops or other products?	1.No	The project is being implemented in a proper way (by considering the concerns indicated via the entire principal Landscape Modification and Soil): Only potential impact to soil would be observed due to construction activities of the project, and these negligible impacts are not permanent. Furthermore, there is an access road to the project area so that there is no problem in accessing the area. The necessary attention to be paid to the speed limits of the trucks and the material inside the trucks will be covered. Trucks to be loaded in line with the axle load and will not be overloaded, the top 10% of the material to be moisturized.	N/A
Principle 9.2 Vulnerability to Natural Disaster			
Will the Project be susceptible to or lead to increased vulnerability to wind, earthquakes, subsidence, landslides, erosion, flooding, drought or other extreme climatic conditions?	1.No	The project is being implemented in a proper way (by considering the concerns indicated via the entire principle Vulnerability to Natural Disaster): The project area is not a place to specific extreme climatic conditions and harmful natural events such as earthquake.	N/A
Principle 9.3 Genetic Resources			
Could the Project be negatively impacted by or involve genetically modified organisms or GMOs (e.g., contamination, collection and/or harvesting, commercial development, or take place in facilities or farms that include GMOs in their processes and production)?	1.No	The project is being implemented in a proper way (by considering the concerns indicated via the entire principle 4.3.3 Genetic Resources): There is no relevance to GMO for landfill projects.	Could the Project be negatively impacted by or involve genetically modified organisms or GMOs (e.g., contamination, collection and/or harvesting, commercial development, or take place in facilities or farms that include GMOs in their processes and production)?
Principle 9.4 Release of pollutants			
Could the Project potentially result in the	1.No	N/A	Wastewater will be vacuumed by vacuum truck regularly. By this

release of pollutants to the environment?			way, discharge of plant sourced wastewater will not be allowed.
Principle 9.5 Hazardous and Non-hazardous Waste			
Will the Project involve the manufacture, trade, release, and/ or use of hazardous and non-hazardous chemicals and/or materials?	1.No	The project activity is a renewable energy project and doesn't involve any hazardous chemicals & other materials. The host party has its credible legislation "Health and Occupational Safety Regulation". Regulation could be found under this link too: http://www.resmigazete.gov.tr/eskiler/2012/06/20120630-1.htm	All relevant legal building codes will be applied appropriately.
Principle 9.6 Pesticides & Fertilisers			
Will the Project involve the application of pesticides and/or fertilizers?	1.No	N/A	N/A
Principle 9.7 Harvesting of Forests			
Will the Project involve the harvesting of forests?	1.No	The project is being implemented in a proper way (by considering the concerns indicated via the entire principle 4.3.7 Harvesting of Forests): There has not been a significant forestation during the construction phase (i.e. project has been approved as EIA positive) and the project does not involve an operation that requires forest harvesting.	N/A
Principle 9.8 Food			
Does the Project modify the quantity or nutritional quality of food available such as through crop regime alteration or export or economic incentives?	1.No	The project is being implemented in a proper way (by considering the concerns indicated via the entire principle 4.3.8 Food): The project does not involve any operation that disrupt husbandry and agriculture in the region.	N/A
Principle 9.9 Animal husbandry			
Will the Project involve animal husbandry?	1.No	The project is being implemented in a proper way (by considering the concerns indicated via the entire principle 4.3.9 Animal husbandry): The project does not involve any operation that disrupt husbandry and agriculture in the region.	N/A
Principle 9.10 High Conservation Value Areas and Critical Habitats			
Does the Project physically affect or alter largely intact or High Conservation Value (HCV) ecosystems, critical habitats, landscapes, key biodiversity areas or sites identified?	1.No	The Project does not affect or alter largely intact or High Conservation Value (HCV) ecosystems, critical habitats, landscapes, key biodiversity areas or sites identified.	N/A

Principle 9.11 Endangered Species			
Are there any endangered species identified as potentially being present within the Project boundary (including those that may route through the area)? AND/OR Does the Project potentially impact other areas where endangered species may be present through transboundary affects?	1.No	There are no any endangered species identified at project site and also no species have the route through area. The project activity does not impact other endangered species through transboundary affects.	N/A

The donot harm assessment between previous version of GS and Safeguarding Assessment of GS4GG is not applicable on the project activity and the same has been transparently mentioned in the transition annex.

Safeguarding principles	Description of relevance to my project	Assessment of my project risks breaching it (low/medium/high)	Mitigation measure
1. Human rights abuses or negative impacts on dignity, cultural property or indigenous people	There are no indigenous people inhabiting the project area.	low	N/A
2. Involuntary settlement	No relocation of people is necessary.	low	N/A
3. Alteration, damage or removal of critical cultural heritage	There is no cultural heritage on the site.	low	N/A
4. Employee's freedom of association	Employees have the freedom of association. The Turkish Government has ratified the ILO conventions (freedom of association) and (right to collective bargaining.)	low	N/A
5. Forced labour	The Turkish Government has ratified the ILO conventions 29 and 105 on elimination of forced and compulsory labor.	low	N/A

6. Child labour	The Turkish Government has ratified the ILO conventions 138 (minimum age) and 182 (worst form of child labour).	low	N/A
7. Discrimination	The Turkish Government has ratified the ILO conventions 100 (equal remuneration) and 111 (discrimination in employment/occupation).	low	N/A
8. Safe and healthy work environment for workers	Workers can get injured	low	All relevant environment, health and safety regulations will be applied as required and all necessary precautions will be taken.
9. Precautionary approach for environmental challenges	Earthquake is a risk. Water contamination is a possibility. Flare unit might not be operated.	low	Bolu is located on a 1st level earthquake risk geography, which has high probability of earthquakes. The project facility will be constructed accordingly. Local building codes require the construction strength to be adjusted appropriately according to earthquake risks. As opposed to the baseline practice, contamination of rainwater will be minimized by effectively covering the waste with impermeable materials. Even if some water leaches into the depths (which is necessary for methane generation), the impermeable landfill bottom will not allow leachate to escape and contaminate ground or underground waters. Leachate recovery is already being carried out. Emission reductions from flaring above 35% of the collected LFG are not

			accepted under the Gold Standard. In case of an unexpected generator failure or overproduction of LFG, the Project owner will flare all remaining LFG in order to minimize health and safety risks as a precautionary approach. Flaring of the residual gas exceeding 35%, which could not be combusted, is not eligible for VERs.
10. Degradation of natural habitats	There is no natural habitat on the site. The surrounding of the landfill is a desolate topography with little trees and a lot of exposed rocks.	low	The Project will be constructed in an environmentally less sensitive area at the landfill site. Therefore, the Project has minimum involvement with its surroundings.
11. Anti-corruption	The Project is not related to any kind of corruption.	low	The Project owner does not have any negative track record related to corruption or any such activity whatsoever. The project was acquired by the project owner through an open tender, which was announced publicly in October 2008 by the Borlu municipality. The tender was organized in October 2008 in accordance with the state procurement law regulated by the public procurement authority.

C.1 Data and parameters to be monitored

Relevant SDG Indicator/Safeguarding Principle	8.5.2. Unemployment rate, by sex, age and persons with disabilities
Data/parameter	Quantitative employment and income generation
Unit	N/A
Description	Number of employment
Source of data	Social security records of the employees
Value(s) applied	-
Measurement methods and procedures	The number of working people will be measured based on social insurance registries and receipts of employees.
Monitoring frequency	Annually
QA/QC procedures	Social security records will be provided
Purpose of data	To exhibit employment performance of the plant
Additional comment	-

Relevant SDG Indicator/Safeguarding Principle	8.5.2. Unemployment rate, by sex, age and persons with disabilities
Data/parameter:	Quality of employment
Unit	-
Description	Safe and healthy working conditions
Source of data	Assessment of working conditions by checking safety material, tasks of the personnel etc.
Value(s) applied	The project activity will provide a safe working environment to its employees. The employees are also given training and education on occupational health and safety issues.
Measurement methods and procedures	-
Monitoring frequency	Continuously
QA/QC procedures:	-
Purpose of data:	To ensure that necessary safety equipment is available and properly used and the working environment does not present health risks or hazardous tasks.
Additional comments:	-

Relevant SDG Indicator/Safeguarding Principle	8.6.1. Proportion of youth (aged 15-24 years) not in education, employment or training
Data/parameter:	Technical trainings to project personnel
Unit	Number
Description	Technology transfer and technological self-reliance
Source of data	Number of Trainings sessions held
Value(s) of applied	Actual values will be updated.
Measurement methods and procedures	Training certificates
Monitoring frequency	Once for each monitoring period

QA/QC procedures:	Training certificates or training attendance records are provided during each monitoring period.
Purpose of data:	Monitoring the trainings to justify contribution to SDG 8.6.1. Protect labour rights and promote safe and secure working environments for all workers, including migrant workers, in particular women migrants, and those in precarious employment.
Additional comments:	

Relevant SDG Indicator/Safeguarding Principle	8.1.1. Annual growth rate of real GDP per capita
Data/parameter:	Value of the imported natural gas avoided (conservative)
Unit	-
Description	Balance of payments and investment
Source of data	The avoided natural gas amount is taken from the indicator “Access to affordable and clean energy services”. The energy content of this amount is multiplied by the ex-ante natural gas price.
Value(s) of applied	Actual values will be updated.
Measurement methods and procedures	-
Monitoring frequency	Continuously
QA/QC procedures:	-
Purpose of data:	-
Additional comments:	In baseline situation, some portions of liquid and solid fossil fuels are extracted in the host country. However, most of the natural gas consumed in the host country is imported. Average natural gas price at the current situation is 4.74 USD/MMBtu ⁵ .

Relevant SDG Indicator/Safeguarding Principle	7.2.1 Renewable energy share in the total final energy consumption
Data/parameter	EC_{PJ,y}
Unit	MWh
Description	Quantity of electricity consumed by the project activity.
Source of data	Electricity meters
Value(s) applied	Actual values will be updated.
Measurement methods and procedures	The quantity of electricity consumed by the project plant will be monitored based on the main meter (also referred as TEİAŞ meters) readings and/or through protocols where and when appropriate.
Monitoring frequency	Continuous and monthly recording.
QA/QC procedures	The electricity meters are used to measure the net electricity exported to the grid and used for billing purposes. Therefore the meters are sealed by TEİAŞ (Turkish Electricity Transmission CO). The grid company is responsible for maintenance and calibration of the device. In accordance with the “Regulation on

⁵ https://www.botas.gov.tr/uploads/dosyaYoneticisi/500881-temmuz_2021_tarifesi_30062021.pdf

	"Measurement and Measuring Tools", electricity meters have to be calibrated within a frequency of once per 10 years ⁶ . The accuracy class of the device is 0.5s.
Purpose of data	Calculation of project emissions
Additional comment	The quantity of electricity consumed is monitored by the same equipment, which monitors the net amount of electricity generated by the project activity.

Relevant SDG Indicator/Safeguarding Principle	7.2.1 Renewable energy share in the total final energy consumption
Data/parameter	TDL_y
Unit	%
Description	Average technical transmission and distribution losses
Source of data	Recent, accurate and reliable data available within the host country
Value(s) applied	TDL _{i,y} : 20%
Measurement methods and procedures	Default value
Monitoring frequency	Fixed for the crediting period
QA/QC procedures	-
Purpose of data	Calculation of baseline and project emissions
Additional comment	-

Relevant SDG Indicator/Safeguarding Principle	7.2.1 Renewable energy share in the total final energy consumption
Data/parameter	EG_{PJ, facility, y}
Unit	MWh
Description	Electricity Generation in year y
Source of data	Electricity meters
Value(s) applied	Estimated as 8,483 MWh/year for ex-ante calculations. The estimation is based on an estimate of 7500h load of 1.131 MW installed capacity.
Measurement methods and procedures	The quantity of net electricity generation supplied to the grid by the project plant will be monitored based on the main meter (also referred as TEİAŞ meters) readings.
Monitoring frequency	Continuous monitoring and monthly recording.
QA/QC procedures	The electricity meters are used to measure the net electricity exported to the grid and used for billing purposes. Therefore the meters are sealed by TEİAŞ (Turkish Electricity Transmission CO) and/or through protocols where and when appropriate. The grid company is responsible for maintenance and calibration of the device. In accordance with the "Regulation on "Measurement and Measuring Tools", electricity meters have to be calibrated within a frequency of once per 10 years ⁷ . The accuracy class of the device is 0.5s.
Purpose of data	Calculation of baseline emissions

⁶ <http://www.mevzuat.gov.tr/Metin.Aspx?MevzuatKod=7.5.6381&MevzuatIliski=0&sourceXmlSearch> (Article 9.b)

⁷ <http://www.mevzuat.gov.tr/Metin.Aspx?MevzuatKod=7.5.6381&MevzuatIliski=0&sourceXmlSearch> (Article 9.b)

Additional comment	-
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Relevant SDG Indicator/Safeguarding Principle	13.2.1 Number of countries with nationally determined contributions, long-term strategies, national adaptation plans and adaptation communications, as reported to the secretariat of the United Nations Framework Convention on Climate Change
Data/parameter	BE _y
Unit	tCO ₂ e
Description	Emission reductions achieved per year
Source of data	Calculated from the power generated and methane destroyed per year
Value(s) applied	Actual values will be updated.
Measurement methods and procedures	Calculated
Monitoring frequency	-
QA/QC procedures	N.A.
Purpose of data	Calculation of baseline emissions
Additional comment	-

Relevant SDG Indicator/Safeguarding Principle	13.2.1 Number of countries with nationally determined contributions, long-term strategies, national adaptation plans and adaptation communications, as reported to the secretariat of the United Nations Framework Convention on Climate Change
Data/parameter	LFG _{elec}
Unit	Nm ³
Description	Quantity of landfill gas destroyed by generation of electricity
Source of data	Measured continuously through a mass flow meter
Value(s) applied	Actual values will be updated.
Measurement methods and procedures	The monitoring system works with continuous measurement devices. It is programmed to automatically save every 10 min. values. The data are stored automatically at the server for 2 years.
Monitoring frequency	Continuous monitoring and monthly recording.
QA/QC procedures	In accordance with the applicable legislation a calibration is interval of every 10 years.
Purpose of data	Calculation of baseline emissions
Additional comment	-

Relevant SDG Indicator/Safeguarding Principle	13.2.1 Number of countries with nationally determined contributions, long-term strategies, national adaptation plans and adaptation communications, as reported to the secretariat of the United Nations Framework Convention on Climate Change
Data/parameter	FCH _{4,PJ,Y}
Unit	Nm ³
Description	Quantity of methane captured by project activity
Source of data	Calculated using quantity of landfill gas used by generation of electricity
Value(s) applied	Actual values will be updated.
Measurement methods and procedures	-
Monitoring frequency	-
QA/QC procedures	-
Purpose of data	Calculation of baseline emissions

Additional comment	-
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Relevant SDG Indicator/Safeguarding Principle	13.2.1 Number of countries with nationally determined contributions, long-term strategies, national adaptation plans and adaptation communications, as reported to the secretariat of the United Nations Framework Convention on Climate Change
Data/parameter	WCH₄
Unit	m ³ CH ₄ /m ³ LFG
Description	Methane fraction in the landfill gas
Source of data	The methane fraction in the LFG is measured continuously by a gas analyser.
Value(s) applied	Actual values will be updated.
Measurement methods and procedures	The monitoring system works with continuous measurement devices. It is programmed to automatically save hourly values. The data are stored automatically at the server.
Monitoring frequency	Continuous monitoring and monthly recording.
QA/QC procedures	In accordance with the applicable legislation a calibration is interval of every 10 years.
Purpose of data	Calculation of baseline emissions
Additional comment	-

Relevant SDG Indicator/Safeguarding Principle	13.2.1 Number of countries with nationally determined contributions, long-term strategies, national adaptation plans and adaptation communications, as reported to the secretariat of the United Nations Framework Convention on Climate Change
Data/parameter	Operation of the energy plant
Unit	Hours
Description	Operation of the energy plant
Source of data	Project participant
Value(s) applied	Actual values will be updated.
Measurement methods and procedures	The counting devices of the engines are counting the operational hours continuously as the operational hours are also used for maintenance reasons.
Monitoring frequency	Continuous monitoring and monthly recording.
QA/QC procedures	N.A.
Purpose of data	Calculation of baseline emissions
Additional comment	-

Relevant SDG Indicator/Safeguarding Principle	13.2.1 Number of countries with nationally determined contributions, long-term strategies, national adaptation plans and adaptation communications, as reported to the secretariat of the United Nations Framework Convention on Climate Change
Data/parameter	AF
Unit	-
Description	Regulatory requirements relating landfill gas projects
Source of data	National laws and regulations.
Value(s) applied	0
Measurement methods and procedures	-

Monitoring frequency	Yearly
QA/QC procedures	In case of a change of Article 27 of the relevant regulation "Control of Solid Waste Regulation", this change will be included to the monitoring plan.
Purpose of data	Calculation of baseline emissions
Additional comment	Since there is no change in the legislative structure that forces old landfill sites to utilize landfill gas and no change to article 27 of the relevant regulation "Control of Solid Waste Regulation", AF and hence MDBL has been considered 0.

Relevant SDG Indicator/Safeguarding Principle	13.2.1 Number of countries with nationally determined contributions, long-term strategies, national adaptation plans and adaptation communications, as reported to the secretariat of the United Nations Framework Convention on Climate Change
Data/parameter:	NO_x Emission
Unit	Tons
Description	The air quality is related to pollutants such as NO _x which are being emitted in the baseline scenario. As a representative indicator of air pollution, nitrogen oxide is selected because mono-nitrogen oxides eventually form nitric acid when dissolved in atmospheric moisture, forming a component of acid rain.
Source of data	Turkish Greenhouse Gas Inventory and electricity generation values of project
Value(s) applied	Total NO _x emission related to electricity generation is about 0.77 Mt in 2019 according to National Inventory of Turkey ^{Error! Bookmark not defined.} . NO _x emission per MWh is calculated as 3.139 kg. Actual values will be updated.
Measurement methods and procedures	Indirectly, by measuring net electricity generation and multiplication with the baseline NO _x intensity of the Turkish grid.
Monitoring frequency	Continuously
QA/QC procedures	-
Purpose of data	-
Additional comments	-

Relevant SDG Indicator/Safeguarding Principle	13.2.1 Number of countries with nationally determined contributions, long-term strategies, national adaptation plans and adaptation communications, as reported to the secretariat of the United Nations Framework Convention on Climate Change
Data/parameter:	SO₂ Emission
Unit	Tons
Description	The air quality is related to pollutants such as SO _x which are being emitted in the baseline scenario. As a representative indicator of air pollution, SO ₂ is selected as further oxidation of

	sulfur dioxide may lead to acid rains and as it is a precursor to particulates in the atmosphere, both of which are environmental concerns.
Source of data	Turkish Greenhouse Gas Inventory and electricity generation values of project
Value(s) applied	Total SO ₂ emission related to electricity generation is about 2.5 Mt in 2019 according to National Inventory of Turkey ⁸ . Considering that electricity generation in 2019 is 245,300 GWh ⁹ , SO ₂ emission per MWh is calculated as 10.19 kg/MWh. Actual values will be updated.
Measurement methods and procedures	Indirectly, by measuring net electricity generation and multiplication with the baseline SO ₂ intensity of the Turkish grid.
Monitoring frequency	Continuously
QA/QC procedures:	-
Purpose of data:	-
Additional comments:	-

Relevant SDG Indicator/Safeguarding Principle	13.2.1 Number of countries with nationally determined contributions, long-term strategies, national adaptation plans and adaptation communications, as reported to the secretariat of the United Nations Framework Convention on Climate Change
Data/parameter	Reduction of discharged cooling water in baseline
Unit	m ³
Description	-
Source of data	Project participant
Value(s) applied	In 2018, 7.5 billion m ³ cooling water was discharged by thermal power plants in Turkey ¹⁰ . Net electricity generation in thermal power plants in 2018 was 205,231,208 MWh ¹¹ , corresponding to 36.5 m ³ /MWh discharged cooling water intensity. Actual values will be updated.
Measurement methods and procedures	The net electricity generation of the project was recorded and multiplied with the ex-ante cooling water discharge intensity.
Monitoring frequency	Continuously
QA/QC procedures	-
Purpose of data	-

⁸ https://webdosya.csb.gov.tr/db/iklim/icerikler/sera_gazi_em-syon-raporu-20200506141834.pdf

⁹ <https://www.statista.com/statistics/892878/electricity-generation-by-fuel-turkey/>

¹⁰ <https://www.enerjiportali.com/tuik-2018-termik-santral-su-atiksu-ve-atik-istatistiklerini-yayimladi/>

¹¹ https://www.epias.com.tr/wp-content/uploads/2019/06/EPIAS_Annual_Electricity_Marker_Report_2018.pdf

Additional comments	This is a conservative approach because most of the cooling water discharge stems from thermal and nuclear (not existing) power plants.
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Relevant SDG Indicator/Safeguarding Principle	13.2.1 Number of countries with nationally determined contributions, long-term strategies, national adaptation plans and adaptation communications, as reported to the secretariat of the United Nations Framework Convention on Climate Change
Data/parameter	H₂S Emission
Unit	ppm
Description	H ₂ S is emitted from the landfill site freely to the atmosphere, creating bad odor and worsens the living conditions of the nearby communities. Although there are several odorous gases in LFG, as a representative indicator of air pollution, hydrogen sulfide is selected because it is a very poisonous, flammable gas with the characteristic foul odor of rotten eggs.
Source of data	By measuring LFG destruction and multiplying with the ex-ante baseline H ₂ S intensity of the LFG.
Value(s) applied	The gas measurements on the Project site show that the H ₂ S concentration in the LFG is 1385 ppm ¹² on average. Actual values will be updated.
Measurement methods and procedures	By measuring LFG destruction and multiplying with the ex- ante baseline H ₂ S intensity of the LFG.
Monitoring frequency	Continuously
QA/QC procedures	-
Purpose of data	-
Additional comments	-

Relevant SDG Indicator/Safeguarding Principle	13.2.1 Number of countries with nationally determined contributions, long-term strategies, national adaptation plans and adaptation communications, as reported to the secretariat of the United Nations Framework Convention on Climate Change
Data/parameter:	Reduction of Volatile Organic Compounds
Unit	m ³
Description	-
Source of data	By measuring the amount of methane destroyed through combustion or flaring.
Value(s) applied	The non-methane VOCs are typically roughly 2% of methane emissions. The VOC destruction by combustion or flaring is greater than 98%. Actual values will be updated.
Measurement methods and procedures	By measuring the amount of methane destroyed through combustion or flaring

¹² Source: Feasibility study of the Project

Monitoring frequency	Continuously
QA/QC procedures	-
Purpose of data	-
Additional comments	-

Relevant SDG Indicator/Safeguarding Principle	13.2.1 Number of countries with nationally determined contributions, long-term strategies, national adaptation plans and adaptation communications, as reported to the secretariat of the United Nations Framework Convention on Climate Change
Data/parameter	Leachate management
Unit	-
Description	-
Source of data	Project participant
Value(s) applied	The leachate will be properly collected, stored, and transported safely to the municipal treatment facility.
Measurement methods and procedures	The leakage is sent to sewage treatment facility of Gaziantep Metropolitan Municipality where the leakage water is disposed. There is declaration of Gaziantep Metropolitan Municipality indicates that they are responsible of collecting the leakage from the project site.
Monitoring frequency	Annually
QA/QC procedures	-
Purpose of data	-
Additional comments	-

Relevant SDG Indicator/Safeguarding Principle	13.2.1 Number of countries with nationally determined contributions, long-term strategies, national adaptation plans and adaptation communications, as reported to the secretariat of the United Nations Framework Convention on Climate Change
Data/parameter	Hazardous waste processing
Unit	-
Description	-
Source of data	Assessment of waste management practice
Value(s) applied	The landfill will only accept municipal waste and not accepting hazardous waste. In accordance with the Turkish law and regulations (Environmental Law ¹³ and Regulation on Waste Management ¹⁴), hazardous waste is only managed by specialized team which is in place.
Measurement methods and procedures	-
Monitoring frequency	Continuously
QA/QC procedures	-

¹³ <http://www.lawsturkey.com/law/environment-law-2872>

¹⁴ https://webdosya.csb.gov.tr/db/cygm/editordosya/Atik_Yonetimi_Yonetmeligi-2017.docx

Purpose of data	To ensure that the project is not function as a hazardous waste disposal or processing facility (i.e., as a hazardous waste gasification – or incineration facility).
Additional comments	-

Relevant SDG Indicator/Safeguarding Principle	13.2.1 Number of countries with nationally determined contributions, long-term strategies, national adaptation plans and adaptation communications, as reported to the secretariat of the United Nations Framework Convention on Climate Change
Data/parameter	Waste Terraces
Unit	-
Description	-
Source of data	Project participant
Value(s) applied	The waste will be landfilled effectively throughout the monitoring period.
Measurement methods and procedures	Assessment of effective covering of the waste
Monitoring frequency	Continuously
QA/QC procedures	-
Purpose of data	-
Additional comments	In baseline situation, the solid waste is being dumped to the landfill site without a soil capping layer and cover material is applied after a longer period.

C.1.1 Other elements of monitoring plan (if applicable)

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

The calculation of the baseline emissions for the project activity is based on approved consolidated methodology ACM0001 “Consolidated methodology for landfill gas project activities” (version 11).

The baseline emissions resulting from electricity consumption are calculated based on the amount of electricity generated and delivered to the grid by the project activity and the corresponding emissions resulting from the production of this amount of electricity by the Turkish grid.

The baseline emissions under this monitoring period include the methane from the existing waste destroyed by the project activity and the baseline emissions from electricity generated utilising the LFG. The baseline emissions are calculated as follows in line with the registered PDD:

$$BE_Y = (MD_{project,y} - MD_{BL}) * GWP_{CH_4} + EL_{LFG} * CEF_{elec}$$

Equation 1

Where:

BE_Y	Baseline emissions in year y (tCO ₂ e)
MB_{BL}	The amount of methane that would have been destroyed during the year y, in the absence of the project activity (tCO ₂ e)
$MD_{project}$	The amount of methane destroyed/combusted during year y, in tonnes of methane in project scenario (tCH ₄)
EL_{LFG}	Net quantity of electricity produced using LFG (MWh)
GWP_{CH_4}	Global Warming Potential value of methane tCO ₂ e/tCH ₄
$CEF_{elec,BL}$	CO ₂ emission intensity of the baseline source of electricity displaced (tCO ₂ e/MWh)

Since there is no change in the legislative structure that forces old landfill sites to utilize landfill gas and no change to article 27 of the relevant regulation “Control of Solid Waste Regulation”, MD_{BL} has been considered 0.

The methane destroyed by the project activity ($MD_{project,y}$)

The methane destroyed by the project activity during the monitoring period is calculated *ex-post* by monitoring the quantity of methane actually flared and gas used to generate electricity and the total quantity of methane captured. According to ACM0001 it is calculated as:

$$MD_{project} = MD_{electricity} = LFG_{electricity} * w_{CH_4} * D_{ch_4}$$

Equation 2

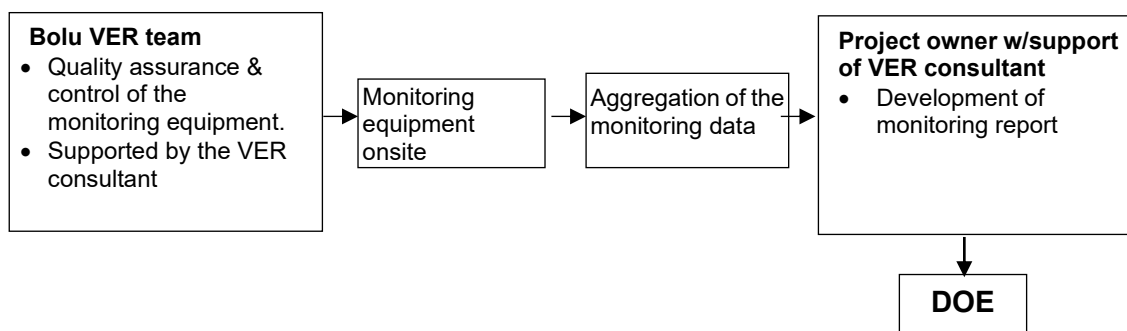
Where:

$MD_{electricity,y}$	Quantity of methane destroyed by generation of electricity (tCH ₄), in year y
$LFG_{electricity}$	Quantity of the landfill gas fed to the fengine(s) during the year measured in cubic meters (m ³),
w_{CH_4}	Average methane fraction of the landfill gas as measured during the year and expressed as a fraction (in m ³ CH ₄ /m ³ LFG)
D_{CH_4}	Methane density expressed in tonnes of methane per cubic meter of methane (tCH ₄ / m ³ CH ₄)

Responsibilities for monitoring

The project owner is responsible for the operation and maintenance of the landfill and the installed equipment¹⁵. The project owner is also responsible for the administration of the data, setting up a VER 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

The Bolu VER-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, whichever occurs later.

Corrective actions and emergency preparedness

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

¹⁵ Except for the electricity meter that monitors both electricity imports and exports, since the monitoring device is sealed by TEİAŞ (Turkish Electricity Transmission Company) and the Project Participant cannot interfere with the device.

QA/QC procedure

Strong quality assurance and quality control procedure will be taken to monitor the equipment and data collection. Equipment and facilities will be subject to a regular maintenance and testing regime to ensure accuracy following supplier's manual. In case of data deficiency or in correct data reading, the data will be crosschecked with other parameters and data leading to the most conservative emission reductions will be considered for the calculation of the emission reductions.

Measuring of exported and imported electricity

The main meter for the monitoring of the electricity import and export is at grid connection. Monthly protocols based on the readings, that are confirmed by both TEİAŞ and the project participant are prepared by the end of each month and stored. These protocols are also the basis of invoicing for the electricity sales from the proposed project activity. The electricity meters are bi directional and will measure both the imported and exported electricity from and to the grid.

Loss of Data

If there will be any loss of data, the lost data will be counted as "0" unless methodology or tools or validation verification manuals of UNFCCC request otherwise.

SECTION D Duration and crediting period

D.1 Duration of project

D.1.1 Start date of project

03/06/2010

D.1.2 Expected operational lifetime of project

15 years

D.1 GS Crediting period of the project/activity

D.2.1 Start date of the ongoing GS crediting period

12/08/2018

D.2.3 End date of the ongoing GS crediting period

11/08/2025

D.2.3 Total length of the GS crediting periods

7 years

SECTION E Stacking of new assets

N/A

Appendix 2. Contact information of project participants

Organization name	CEV Marmara Enerji Üretim San. ve Tic. Ltd. Şti.
Registration number with relevant authority	
Street/P.O. Box	Kızılırmak Mahallesi Dumlupınar Bulvarı No:9A/151
Building	-
City	Çankaya
State/Region	Ankara
Postcode	-
Country	Turkey
Telephone	0342 485 1012
Fax	-
E-mail	info@cev-tr.com
Website	www.cev-tr.com
Contact person	Mustafa Doğru
Title	-
Salutation	Mr.
Last name	Doğru
Middle name	-
First name	Mustafa
Department	-
Mobile	-
Direct fax	-
Direct tel.	-
Personal e-mail	-

Organization name	EKI Energy Services Limited
Registration number with relevant authority	NA
Street/P.O. Box	EnKing Embassy, Plot 48, behind vrindavan hotel, Part II, Vijay Nagar
Building	-
City	Indore
State/Region	-
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