



Verification and certification report form for GS project activities

VERIFICATION AND CERTIFICATION REPORT

Title of the project activity	Gazişehir LFG Utilization Project
GS Reference number of the project activity	11662
Version number of the verification and certification report	3.0Aa
Completion date of the verification and certification report	28/07/2025
Monitoring period number and duration of this monitoring period	1 st monitoring period 01/01/2022 – 31/03/2023 (both days included)
Version number of monitoring report to which this report applies	Version 7.0 of 26/07/2025
Crediting period of the project activity corresponding to this monitoring period	01/01/2022 – 31/12/2026 (1 st crediting period)
Project participant(s)	Gazişehir Enerji Üretim Sanayi Ticaret A.S. (Private Entity, Project Owner), Oak Danismanlik (Private Entity, Project Representative),
Host Party	Türkiye
Sectoral scope(s), selected methodology(ies)	Sectoral scope 1: Energy Industries (Renewable-/non-renewable sources) Sectoral scope 13: Waste handling and disposal ACM0001: Flaring or use of landfill gas --- Version 19.0
Estimated GHG emission reductions or net anthropogenic GHG removals for this monitoring period in the registered PDD	293,576 tCO ₂ (GS-VER)
Certified GHG emission reductions or net anthropogenic GHG removals for this monitoring period	538,985 tCO ₂ (GS-VER)
Name of VVB	RINA Services S.p.A. (RINA)
Name, position and signature of the approver of the verification and certification report	<i>Laura Severino</i> Laura Severino (Authorized officer signing for VVB) Decarb & Chain of Custody Product Management

SECTION A. Executive summary

Purpose and general description of the project

The purpose of the project activity is to collect and to recover LFG gas accumulated in the landfill area and generate electricity via gas engines to generate electricity with a total installed capacity of 13.520 Mwe as per the Generation License /18/. The generated electricity will be fed to national grid. The project activity fits into the renewable energy supply category, qualifies as a large scale, as defined in the GS4GG project activity. The project activity has a total active 11 engines $((5 \times 1.451) + (5 \times 1.161) + 0.823 \text{ MWm} / ((5 \times 1.413) + (5 \times 1.131) + 0.800 \text{ MWe}))$ verified through site visit and generation license/18/. The activity is expected to generate approximately 85.17 GWh/year of energy and delivered to the national grid. The Project is estimated to reduce 293,576 tCO_{2eq} emission reductions per year with a total of 1,467,881 tCO₂ over the 5 year first crediting period /1/.

The project activity comprises of renewable energy generation from waste to energy involving landfill gas utilization to generate and deliver electricity to the national grid without thermal energy production. The project type is landfill which is an eligible project type as it is in accordance with Eligible Project Types & Scope under Renewable Energy Activity Requirements. The project is located in Türkiye. Türkiye is upper middle- income economy where the penetration level of the proposed Renewable Energy Technology type is less than %5 of the total grid installed capacity, at the time of the first submission to Gold Standard (eligibility clause was come into effect from 24 Jan 2020). The project activity aims to reduce the greenhouse gas emissions in Türkiye by replacing fossil fuel power generation and contributing to the development of the waste energy sector in Türkiye, as well as aims to support the local economy by creating local employment and providing equipment locally. The project activity's compliance with the eligibility criteria has been demonstrated in accordance with the GS PDD /1/ and the GS Requirements /3/ /4/ /32/.

The GHG benefit of the project activity was only accounted under Gold Standard. There are not any other RECs, (I-REC etc.) or other voluntary standards such as VCS, GCC were being issued for the project activity /33-37/. Furthermore, as a host country in Türkiye such any programme like a government-regulated system or programme for the constraint and monetisation of GHG emissions (such as emissions trading scheme, cap and trade or carbon tax mechanisms) has not been implemented.

Location

The project is within boundaries of Gaziantep Province, Şahinbey District, Bağlarbaşı Village (neighborhood) Türkiye /1/. The nearest settlement to the project is in Akbulut Village (neighborhood).

Scope of verification

Verification is the periodic independent review and ex-post determination by a VVB of the monitored reductions in GHG emissions that have occurred as a result of the registered GS project activity during a defined monitoring period. Certification is the written assurance by a VVB that, during a specific period in time, a project activity achieved the emission reductions as verified. The objective of this verification is to verify and certify emission reductions reported for the Gazişehir LFG Utilization Project for the period from 01/01/2022 – 30/03/2023.

The scope of the verification is to verify that:

- The project activity has been implemented and operated in accordance with the registered PDD or any approved revised PDD;
- The monitoring plan, including compliance with any guidance provided by the Board regarding deviations from the provisions of a registered plan and/or methodology;
- The data and calculation of GHG emission reductions have been assessed to correctly support the emission reductions being claimed.

The verification shall ensure that reported emission reductions are complete and accurate in order to be certified.

Verification process

Verification is conducted using RINA procedures in line with the GS requirements and requirements specified in the CDM Validation and Verification Standard available at the time of the verification starts and applying standard auditing techniques. RINA assess and determines that the implementation and operation of the project activity, and steps taken to report emission reductions comply with the GS criteria. The verification assessment involved a document review of relevant documentation and the on-site visit.

Verification is not meant to provide any consultancy towards the project participants. However, stated requests for clarifications and/or corrective actions may have provided input for improvement of the monitoring.

Conclusion

RINA commissioned by Gazişehir Enerji Üretim Sanayi Ticaret A.S. has performed the verification of the emission reductions reported for the project activity Gazişehir LFG Utilization Project GS Registration Reference No. 11662 for the monitoring period 01/01/2022 – 30/03/2023 with regard to the relevant GS requirements and principles for project activities. The project was validated by RINA in line with the combined Validation-Verification process, validation report /10/.

The GHG emission reductions are calculated on the basis of the approved methodology ACM0001: Flaring or use of landfill gas - Version 19.0 and the monitoring plan included in the registered PDD version 7.0 of 04/07/2024 /1/. In our opinion the GHG emission reductions reported for the project in the monitoring report version 6.0 of 15/01/2025 are fairly stated.

SECTION B. Verification team, technical reviewer and approver

The project was validated by RINA in line with the combined Validation-Verification process, as provided in the validation report /10/.

B.1. Verification team member

No.	Role	Type of resource	Last name	First name	Affiliation (e.g. name of central or other office of VVB or outsourced entity)	Involvement in			
						Desk review	On-site inspection	Interview(s)	Verification findings
1.	Team Leader, Verifier, Local Expert, Technical Expert TA 13.1	ER	Ekinci Özen	Fulya	RINA Türkiye	✓	✓	✓	✓

B.1.1. Previous Audit (Validation team member)

No.	Role	Type of resource	Last name	First name	Affiliation (e.g. name of central or other office of DOE or outsourced entity)	Involvement in			
						Desk review	On-site inspection	Interview(s)	Validation findings
1.	Team Leader, Local Expert, Validator, Technical Expert TA 13.1, TA 1.2	ER	Ekinci Özen	Fulya	RINA Türkiye	✓	✓	✓	✓
2.	Financial Expert	ER	Milkov	Viktor	RINA Bulgaria	✓			✓

B.2. Technical reviewer and approver of the verification and certification report

No.	Role	Type of resource	Last name	First name	Affiliation (e.g. name of central or other office of VVB or outsourced entity)
1.	Technical reviewer	IR	Erdoğan	Mehmet	RINA Türkiye
2	Approver	IR	Severino	Laura	RINA HO

B.2.1. Previous Audit (Validation technical reviewer) of the validation report

No.	Role	Type of resource	Last name	First name	Affiliation (e.g. name of central or other office of DOE or outsourced entity)
1.	Technical reviewer	IR	RACHEV	Konstantin	RINA Bulgaria

SECTION C. Application of materiality

C.1. Consideration of materiality in planning the verification

No.	Risk that could lead to material errors, omissions or misstatements	Assessment of the risk		Response to the risk in the verification plan and/or sampling plan
		Risk level	Justification	
1.	Human error in the quantification of emissions (which may be more likely to occur if personnel are unfamiliar with, or not well trained regarding, emissions processes or data recording).	Low	Even if being 1 st verification of 1 st crediting period, the project proponent and project representative is familiar with monitoring procedures and data reporting in line with the registered PDD and certification report. The prime monitoring parameters are net export to grid which is as per monthly generation report as recorded in calibrated energy meters and volumetric flow of LFG which will be monitored via volumetric flow meter. Hence, the risk level is low. According to the Guideline Application of materiality in verifications version 02 of 20/02/2015, if the project is a large-scale project activity achieving total emission reductions of <300,000 tons of CO ₂ e per year; as such, a 2 per cent materiality thresholds is applied.	During the site visit, the verification team will interview the staffs of the project activity team and check all records to confirm whether the monitoring plan has been well implemented. The major parameters used for determining the project's baseline emissions are the measurement of net electricity generation according to the monitoring plan is recorded monthly. The team will review the whole data set of the monthly report and crosschecked against invoice raised. The verification team will check the relevant records to confirm whether the data collection procedure and QA/QC procedure have been well implemented.
2	Undue reliance on a poorly designed information system, which may have few effective quality controls.	Low	Even if being the 1 st verification of 1 st crediting period, the project proponent has already established a well organized monitoring team, monitoring plan, including data collection procedure and QA/QC procedure consistent with registered monitoring plan with the help of carbon consultant. Monitoring equipments are calibrated at defined frequency. Hence, the risk level is low.	
3	Manual adjustment of otherwise automatically recorded activity levels.	Low	As detailed in section C.2 below, the data of the main monitoring parameters are taken from calibrated meters (energy meter) and can be verified from totalizer values. The monitoring equipment's are calibrated according to national standards and rules. Hence, the risk level is low. Even if the difference between the main and back up meter. An adjustment factor will be implemented by PP as stated both in PDD and MR.	

C.2. Consideration of materiality in conducting the verification

The project activity happens at a double site and export to grid from the plant is monitored and recorded using calibrated energy and flow meter and 100% data is available for verification. The data which directly affect emission reduction calculations being net electricity generation is monitored and measured by calibrated electricity meters, 100% verifiable. Hence, in line with paragraph 329 and section 9.1.2.3.1 of the CDM Validation and Verification standard /6/ no significant reporting risks to the materiality of the verification were envisaged while planning for the verification and were not identified during the verification process. During the course of the verification, the team reviewed the whole data set of monthly records State Regulated Automated Meter Reading System (OSOS) /21/ for net electricity and cross-check against EPIAS platform screenshot records /22/. The data reported in the monitoring report are consistent with the monthly EPIAS platform screenshot and volumetric flow meter and gas analyser records /22/, and the emission reductions are correctly calculated. In conclusion, the verification team confirms the data set to be free from material error.

SECTION D. Means of verification

D.1. Desk review

The monitoring report version 7.0 of 26/07/2025 and previous versions /2/ the emission reduction calculations provided in the form of a spreadsheet version version 7.0 of 26/07/2025 and previous versions /9/, the approved baseline and monitoring methodology ACM0001: Flaring or use of landfill gas - Version 19.0 of 28/11/2014 /7/ and all the documentation provided to support the monitoring period /1 – 31/, was assessed as part of the verification. In addition, the Project Design Document (PDD) version 7.0 of 04/07/2024 /1/, in particular as regards the baseline estimations and the monitoring plan, and the validation report version 1.1Aa issued on 06/07/2024 /9/ for the project, were reviewed as combined. The list of all documents reviewed are referenced during the verification is available in Appendix 3 below.

D.2. On-site inspection

Duration of on-site inspection: 19/07/2023 - 20/07/2023				
No.	Activity performed on-site	Site location	Date	Team member
1.	Implementation and operation of the proposed project activity. Checked the monitoring equipment, interviewed key personnel of the plant to confirm the operational and data collection procedures, cross-checked between information provided in the monitoring report and data plant	Gaziantep, Sahinbey District Türkiye	19/07/2023 20/07/2023	Fulya Ekinci Özen
2	Reviewed the information flows for generating, aggregating and reporting the monitoring parameters			
3	Checked calibration performance, reviewed calculations and assumptions made in determining the GHG data and emission reductions			
4	Checked the quality control and quality assurance procedures in place to prevent or identify and correct any errors or omissions in the reported monitoring parameters			
5	Cross-checked between information provided in the monitoring report and data evidence, including the Gold Standard parameters			

D.3. Interviews

No	Interviewee			Date	Subject	Team member
	Last name	First name	Affiliation			
1.	Y.	Şerif	Plant Manager	19/07/2023 20/07/2023	Implementation status of the project Monitoring equipment and operation Generated Electricity Monitoring of GS4GG SDG Parameters; Employment (Job Quality) and Employment (numbers) Emission reductions calculations Monitoring plan and monitoring Logbook & Input Expropriation	Fulya Ekinci Özen
2	A.	Yusuf	Plant Environmental Engineer			
3	Ş.	Burak	Consultant			
4	A.	Ömer	OAK Danışmanlık Consultant			
5	M.	Cemil	Akbulut Neighbourhood		Benefit of the project to the village Local Employment Environmental Impacts Logbook & Input Expropriation	
6	M.	Mehmet	Akbulut Neighbourhood (headman)			
7	M.	Cahit	Akbulut Neighbourhood			

According to the GS VVS rules QA & answer document /30/; before the interview started with the local stakeholders, the auditor informed them that their information and comments would be included in the report, and their verbal approval was obtained.

The project site was visited on 19/07/2023 and 20/07/2023, for a combined validation and verification process. During the visit, interviews were conducted with project employees and consultants regarding the implementation status, monitoring equipment and operations, and the electricity generated by the project. On-

site, the team also interviewed mukhtar and local residents who expressed no complaints about the project. They reported having a good relationship with the project's employees and shared positive opinions about the project activities. The VVB wanted to speak with the local residents, especially women, but they were unavailable and not very willing to participate in the interview. The VVB note states that this is a common issue in these regions.

The continuous input/grievance mechanism has been verified through interviews with the Akbulut village headman and local stakeholders. Grievance log book have been provided to the Akbulut Village Muchtar on 16/04/2022 as part of the grievance mechanism. It has been checked by VVB during the site visit and it was confirmed that no negative feedback or comments were received related to project activity during grievance mechanism and continuous inputs for the project activity through log book [/37/](#). Additionally, during the interview, stakeholders and project employees were asked if any legal contests or disputes had arisen during the monitoring period. They confirmed that no legal contests or disputes have occurred.

D.4. Sampling approach

Not applicable.

D.5. Clarification requests, corrective action requests and forward action requests raised

Areas of verification findings	No. of CR	No. of CAR	No. of FAR
Compliance of the monitoring report with the monitoring report form			
Compliance of the project implementation with the registered PDD	1	1	1
Post-registration changes			2
Compliance of the monitoring plan with the monitoring methodology including applicable tool and standardized baseline			
Compliance of monitoring activities with the registered monitoring plan			1
Compliance with the calibration frequency requirements for measuring instruments			
Assessment of data and calculation of emission reductions or net removals			
Others (Continuous Input and Grievance)			1
Total	1	1	5

SECTION E. Verification findings

E.1. Compliance of the monitoring report with the monitoring report form

Means of verification	The monitoring report version 7.0 and previous versions /2/ submitted by the PP have been the basis for starting the verification process. RINA confirms that the Monitoring report is based on the currently valid MR template of GS4GG Monitoring Report, version 1.1 /10/ .
Findings	NA
Conclusion	RINA verified that the monitoring report was completed in accordance with the GS4GG Monitoring Report Form, version 1.1.

E.2. Remaining forward action requests from validation and/or previous verification

Based on the combined validation & verification process performed by VVB, No FARs were raised during the validation period [/9/](#).

E.3. Compliance of the project implementation with the registered project design document

Means of verification	The Monitoring Report for the project activity "Gazişehir LFG Utilization Project version 7.0 submitted by the Gazişehir Enerji Üretim Sanayi Ticaret A.S. has been the basis for the verification process. It was verified during the site visit that the proposed project activity has been implemented and it is in operation in accordance with the project activity described in the registered PDD /1/ . The crediting starting date is defined as from 01/01/2022 – 31/12/2026 under section C.2.1 of the PDD /1/ which is the real action. The project activity has a total active 11 engines ((5x1.451) + (5x1.161) + 0.823 MWm / ((5x1.413) + (5x1.131) + 0.800 MWe) verified through site visit and generation license /15/ .
Findings	Please refer to CR 1 of Appendix 4 of this project.
Conclusion	Based on the onsite inspection and checking the above documents, RINA confirms that the project activity has been implemented and it is in operation as described above in accordance with the project activity in the registered PDD /1/ .

E.4. Post-registration changes

E.4.1. Temporary deviations from the registered monitoring plan, monitoring methodology or standardized baseline

There have not been any temporary deviations from the approved Monitoring & Reporting Plan, methodology or standardized baseline.

E.4.2. Corrections

There are no corrections applied during this monitoring period.

E.4.3. Changes to the start date of the crediting period

There have been no changes to the start date of the crediting period.

E.4.4. Inclusion of a monitoring plan to a registered project activity

Not applicable.

E.4.5. Permanent changes from registered monitoring plan, monitoring methodology or standardized baseline

Not applicable.

E.4.6. Changes to the project design of a registered project activity

Not applicable.

E.4.7. Types of changes specific to afforestation and reforestation project activities

Not applicable.

E.5. Compliance of monitoring plan with the monitoring methodology including applicable tool and standardized baseline

Means of verification	The project applies the approved methodologies “ACM0001: “Flaring or use of landfill gas” version 19.0 of 14/06/2019 /7/. The following tools are also applicable to the project activity: 1. Emissions from solid waste disposal sites (version 08.1 of 24/03/2023); /12/ 2. Investment analysis (version 12.0. of 28/11/2019) /16/. (Used for only validation process) 3. Tool to determine the remaining lifetime of equipment (version 01.0.0 of 16/10/2009); /8/ (Used for only validation process) 4. Tool to determine the mass flow of a greenhouse gas in a gaseous stream (version 03.0.0 of 27/11/2015); /31/ 5. Combined tool to identify the baseline scenario and demonstrate additionality (version 07.0.0 of 22/09/2017); /28/ 6. Tool to calculate project or leakage CO2 emissions from fossil fuel combustion (version 03.0.0 of 22/09/2017); /27/ 7. Tool to calculate the emission factor for an electricity system (version 07.0.0 of 31/08/2018); /13/
Findings	NA
Conclusion	The monitoring plan in the registered PDD /1/ is in accordance with the monitoring methodology Baseline and Monitoring Methodology ACM0001: Flaring or use of landfill gas - Version 19.0.

E.6. Compliance of monitoring activities with the registered monitoring plan

E.6.1. Data and parameters fixed ex ante or at renewal of crediting period

Means of verification	The parameters were available at the validation stage, which do not need to monitor during the crediting period, as per the registered PDD /1/ .				
		Data/parameter	Unit	Value applied	Assessment
	/1/	ϕ_y	-	0.75	Default value for the model correction factor to account for model uncertainties. The value has been applied according to the methodological tool “Tool to determine emissions avoided from disposal of waste at a solid waste disposal site” /12/ .
	/2/	OX (OX _{top_layer})	-	0.1	Fraction of methane that would be oxidized in the top layer of the SWDS in the baseline. According to IPCC, the oxidation factor is taken as 0.1. “When methane passes through the top-layer, part of it is oxidized by methanotrophic bacteria to produce CO2. The oxidation factor represents the proportion of methane that is oxidized to CO2 This should be distinguished from the methane correction factor (MCF) which is to account for the situation that ambient air might intrude into the SWDS and prevent methane from being formed in the upper layer of SWDS”.
	/3/	F	-	0.5	Fraction of methane in the SWDS gas (volume fraction) A default value of 0.5 has been used as recommended by IPCC 2006 Guidelines for

					National Greenhouse Gas Inventories and 2019 Refinement.
/4/	$DOC_{f,default}$	-	0.5		Default value for the fraction of degradable organic carbon (DOC) in MSW that can decompose in the SWDS. A default value of 0.5 has been used as recommended by IPCC 2006 Guidelines for National Greenhouse Gas Inventories and 2019 Refinement.
/5/	$MCF_{default}$	-	1		Methane correction factor. According to IPCC the value of 1 has been used justified 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) leveling of the waste.
/6/	DOC_j	-	Different Values		Fraction of degradable organic carbon in waste type j (weight fraction). The following values for the different waste types have been applied (% wet waste): –43% wood and wood products –40% pulp, paper and cardboard –15% food, food waste, beverages and tobacco –24% textile –0% Glass, plastic, metal, other inert waste –20% Garden, yard and park waste
/7/	k_j	1/yr	Different values		Decay rate for the waste type j The following values for the different waste types have been applied (boreal and temperature – wet): –0.03% wood, wood products and straw –0.06% pulp, paper, cardboard –0.185% food, food waste, sewage sludge, beverage and tobacco –0.1% non-food organics, putrescible garden and park waste
/8/	GWP_{CH_4}	tCO_2e/ tCH_4	28		Global Warming Potential of CH_4 As per the IPCC , the value is fixed. It shall be updated according to any future COP/MOP decision
/9/	η_{PJ}	%	50		Efficiency of the LFG capture system that will be installed in the project activity.The value is taken as 50%.
/10/	$EF_{grid,OM,y}$ Operating Margin of Türkiye National Grid	tCO_2e/ MWh	0.7424		The data used to determine the OM emission factor of the grid is obtained from “Informative Note on Emission Factor of Türkiye's National Electricity Grid” (ETKB-EVÇED-FRM-039 Rev.02) published by the

					Ministry of Energy and Resources., 20/09/2022".
	/11/	EF_{grid,BM,y} Build Margin of Türkiye National Grid	tCO ₂ e/ MWh	0.3680	The data used to determine the OM emission factor of the grid is obtained from The data used to determine the OM emission factor of the grid is obtained from "Informative Note on Emission Factor of Türkiye's National Electricity Grid" (ETKB-EVÇED-FRM-039 Rev.02) published by the Ministry of Energy and Resources., 20/09/2022".
	/12/	EF_{grid,CM,y} Combined Margin of Türkiye National Grid	tCO ₂ e/ MWh	0.5552	The data used to determine the OM emission factor of the grid is obtained from The data used to determine the OM emission factor of the grid is obtained from "Informative Note on Emission Factor of Türkiye's National Electricity Grid" (ETKB-EVÇED-FRM-039 Rev.02) published by the Ministry of Energy and Resources., 20/09/2022". The emission factor is calculated as a combined margin (CM), consisting of the combination of operating margin (OM) and build margin (BM) according to the procedures prescribed in the tool /13/.
	/13/	Pn	(Pa)	101325	Total pressure at normal conditions. (Pa). A default value of 101325 Pa has been used.
	/14/	Tn	K	273.15	Temperature at normal conditions. (K). A default value of 273.15 K has been used.
	/15/	Ru	Pa.m ³ /kmol	8314	Universal ideal gases constant. (Pa.m ³ /kmol.K). Tool to determine the mass flow of a greenhouse gas in a gaseous stream. A default value of 8314 Pa.m ³ /kmol.K has been used.
	/16/	MM _{CH₄}	kg/kmol	16.04	Molecular mass of CH ₄ (kg/kmol). Tool to determine the mass flow of a greenhouse gas in a gaseous stream. A default value of 16.04 kg/kmol has been used.
Findings	NA				
Conclusion	Data and parameters fixed ex-ante are in accordance with the registered PDD /1/.				

E.6.2. Data and parameters monitored

Means of verification	The following parameters are monitored in accordance with the registered PDD /1/. All the values are confirmed as per the raw data provided from the measurement device.						
		Parameter	Description/Assessment				
	/1/	EC _{BL,y} (MWh/yr)	<table><tr><th>Period</th><th>MWh</th></tr><tr><td>01/01/2022-30/03/2023</td><td>98,693</td></tr></table>	Period	MWh	01/01/2022-30/03/2023	98,693
			Period	MWh			
			01/01/2022-30/03/2023	98,693			
SDG7 Affordable and Clean Energy/ Indicator: 7.2.1 Renewable energy share in the total final energy consumption: Quantity of net electricity generation that is produced and fed into the grid as a result of the implementation of the project activity in year y. Refers to net electricity production from renewable sources. The quantity of electricity supplied by the project plants/units to the grid and the quantity of electricity delivered to the project plant/unit from the grid have been measured in line with the registered PDD. There are two official and viable sources where the meter readings could be extracted from. One is the State Regulated Automated Meter Reading System (OSOS) and the other source is the EPIAS platform. OSOS records have been considered as the main source for this parameter. Use electricity meters installed at the grid interface for electricity export to grid and for supply to captive consumers use electricity meters installed at the entrance of the electricity consuming facility. Continuously and at least monthly recording. The electricity meter will be subject to maintenance and testing regime according to recognized procedures. Maintenance and calibration of equipment will be carried out according to the instructions of the manufacturer and legislation. According to the legislation the electricity meters are subject to periodic maintenance every 10 years. 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). Electricity meters: Specification Main Meter Type: KÖH – AELTF Year of Manufacture: 2021 Serial Number: 21012222 Date of Calibration #1 29/06/2021 Manufacturing Standard / Class: 0.5S The project activity also has a secondary meter. The secondary							

		meter is not used to calculate the emission reductions. Electricity meters are examined during on site verification. Meter results are recorded in daily reports and cumulative results are seen in ER calculation excel spread sheet /10/.
/2/	SDG.3 / LFG destroyed - $V_{t,wb}$	Volumetric flow of the gaseous stream in time interval t on a wet basis Volumetric flow of the gaseous stream in time interval t on wet basis ($m^3_{\text{wet gas/h}}$): This parameter has been monitored continuously by volumetric flow meter. The flow meters will be calibrated (10 year) as per the regulations /18/. The Project uses a Flow Meter that provides normalized volume flow of gases without any additional pressure (P_t) and temperature (T_t) compensation. The values has been verified as 47,283,278 Nm^3 through ER calculation spreadsheet /10/. The VVB has assessed the monitoring and measurement approach for the parameter $V_{t,wb}$ in accordance with the approved methodology ACM0001. During the site visit the VVB has checked the calibration records of the flow meter to ensure its validity during the monitoring period. The raw monitored data on a month-wise basis, ensuring consistency with reported values. The traceability of the data recorded in the monitoring reports against the original log sheets and system outputs. Flow meter: EPI Series 540 thermal mass flow Serial number: 21021903 Accuracy +/- 1% Date of Calibration: 17/03/2021 checked during the site visit /26/.
/3/	vCH_4,t,wb	Volumetric fraction of CH_4 in a time interval t on a wet basis. Volumetric fraction of CH_4 in a time interval t on wet basis ($m^3 \text{ gas } CH_4/ m^3 \text{ wet gas}$): This parameter has been monitored continuously by gas analyzer. Continuous gas analyzer operating in wet-basis will be calibrated (10 year) as per the regulations /27 . The values has been verified as 57% $m^3 \text{ gas } CH_4/m^3$ through ER calculation spreadsheet /10/. Gas Analyzers: EPI Series 540 (Stationary Biogas-measuring system for continuous measurements) Serial number: 21041502 Accuracy +/- 1.8% Date of Calibration: 10/05/2021 /26/. SWG100biogas (Non-Stationary Biogas-measuring system for continuous measurements) Serial number: 081440 Date of Calibration: 25/05/2021 /26/.
/4/	$ECP_{J,y}$	Quantity of electricity consumed by the project activity (MWh): The quantity of electricity consumed by the project plant has been monitored based on the main meter (also referred as TEİAŞ meters) readings There are two official and viable sources where the meter readings could be extracted from. One is the State Regulated Automated Meter Reading System (OSOS) and the other source is the monthly

		protocols confirmed by the distribution company. State Regulated Automated Meter Reading System has been considered as the main source for this parameter while monthly protocols could (OSF (Official Settlement Files from the grid operator) be used for cross check. Value applied 5 MWh verified through ER calculation spreadsheet /10/. The quantity of electricity consumed is monitored by the same equipment, which monitors the net amount of electricity generated by the project activity. KÖH – AELTF 21012222 Accuracy Class C 0.5 Date of Calibration: 29/06/2021 performed by Toroslar Elektrik DAğıtım A.S. /25/
/5/	TDLy	Average technical transmission and distribution losses (%): This parameter will be monitored annually. Value is taken as 13.8% for ex-ante calculations from TEIAS statistics /20/. It has been verified that in the absence of data from the relevant year, most recent figures should be used, but not older than 5 years. The VVB has reviewed the supporting references and confirms that the applied TDL value aligns with the approved sources and has been correctly implemented in the emission reduction calculations /10/.
/6/	Operation of the power plant	Operational duration of the power plant (h) will be monitored annually by data log system of the power plant. The value for this crediting period is expected as 6300 h. A: The equipment description here is more applicable for heat production (such as boilers, furnaces, or flares). Specifically, three parameters need to be monitored: A) Minimum operating temperature, B) Pilot flame, and C) Steam production /1/ /7/. None of these parameters are applicable to gas engines. When the explanation in the rest of the tool and methodology and the origin of this monitoring parameter are considered, it is understood that this is not applicable to electric gas engines. The aim is to avoid claiming carbon credits without LFG consumption. Since the calculation for gas engines is already based on the amount of LFG consumed, this control becomes meaningless. Therefore, it was not included as a monitoring parameter.
/7/	SDG 13 / ERy	SDG13 - Emission Reductions in year y (t CO_{2e}): This parameter will be calculated once for each verification period by electricity meters and emission factor of the project. The Project reduced 538,985 tCO₂ emission reductions for the current monitoring period 01/01/2022 – 31/03/2023 (both days included) verified through ER calculation spreadsheet /10/.
/8/	Management of SWDS	Management of SWDS: Project participants will refer to the original design of the landfill to ensure that any practice to increase methane generation occurs prior to the implementation of the project activity. If any change in the management of the SWDS after the implementation of the project activity should be justified by referring to technical or regulatory specifications. Hence, no change in the management of the SDWS.
/9/	SDG.1 / Social security coverage	Social security coverage: 100 % of employees with social security and it has been verified through the Social security records /23/.

	/10/	SDG.8 Quantification of employment	SDG.8.a / Quantification of employment: Minimum of 25 employee must be worked for project activity as in line with the registered PDD. Current monitoring period it has been verified as 32 through Social security records /23/. All employment is full time and permanent. Hence, the target number has been verified during the verification process.																				
	/11/	SDG.8 / Quality of Employment	SDG.8.b / Quality of Employment: All employees have been provided health and security trainings training for each verification through training log book. The training certificates for each employee have been provided /24/.																				
According to the monitoring plan in the registered PDD /1/ and in the monitoring report version 6.0 of 15/01/2025 /2/, estimated emission reduction and the following sustainability parameters (SDGs) are monitored /2/ /4/. SDGs: <table border="1"> <thead> <tr> <th>ID</th><th>PDD Value (annually)</th><th>MR Value (annually)</th><th>Comparison With Ex-Ante Calculations</th></tr> </thead> <tbody> <tr> <td>SDG 13</td><td>293,576</td><td>431,189</td><td>47%</td></tr> <tr> <td>SDG 7</td><td>85,176</td><td>78,954</td><td>-7%</td></tr> <tr> <td>SDG 8a</td><td>25</td><td>32</td><td>28%</td></tr> <tr> <td>SDG 8b</td><td>100%</td><td>100%</td><td></td></tr> </tbody> </table> The above parameters have been monitored in accordance with the monitoring plan in the registered PDD /1/ and the monitoring report /2/. Actual values of SDGs achieved during this monitoring period have been verified through supporting documents. Additionally, Ex-Ante calculation and Ex Post calculation (hence parameters) are different under the ACM0001 Methodology /7/. vCH₄,t,wb is a parameter which the ex-post relies on therefore here is a value to it under the MR. On the other hand, parameters such as Ru, Temperature, F, MMCH₄, Pn and Tn are parameters that ex -ante calculation use but not a monitoring parameters in line with the methodology section 5.4.1.1 and 5.4.1.2.				ID	PDD Value (annually)	MR Value (annually)	Comparison With Ex-Ante Calculations	SDG 13	293,576	431,189	47%	SDG 7	85,176	78,954	-7%	SDG 8a	25	32	28%	SDG 8b	100%	100%	
ID	PDD Value (annually)	MR Value (annually)	Comparison With Ex-Ante Calculations																				
SDG 13	293,576	431,189	47%																				
SDG 7	85,176	78,954	-7%																				
SDG 8a	25	32	28%																				
SDG 8b	100%	100%																					
Findings	NA.																						
Conclusion	RINA's opinion that the monitoring of the project activity has been carried out in accordance with the monitoring plan in the registered PDD /1/. All the parameters were monitored and determined as per the registered monitoring plan. VVB confirms through site visit verification, from the document review, the actual monitoring system complies with the registered monitoring plan. During the verification, all the relevant monitoring parameters of the registered monitoring plan have been verified with regard to the appropriateness of the verification method; the correctness of the values applied for ER calculation, the accuracy and applied QA/QC measures. It is confirmed that all the monitoring parameters have been measured/determined without material misstatements and are in line with all applicable standards and relevant requirements.																						

E.6.3. Implementation of sampling plan

Means of verification	N/A
Findings	N/A
Conclusion	N/A

E.7. Compliance with the calibration frequency requirements for measuring instruments

Means of verification	TEAIS is responsible for calibration and maintenance of the devices as per the registered revise PDD /1/. The project owner has no control on the meters since the meters are sealed by the TEIAS. If any major discrepancy occurs between the two meters, TEIAS performs necessary calibration. Even if there is no discrepancy was occurred during this monitoring period, the maintenance and calibration of the meters are carried out yearly according to the System Connection Agreement.
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	Electricity meters, flow meters and gas analysers are periodical controlled by TEIAS as presented under Section E.6.2 /18/ /19/ and also will be tested by TEIAS as confirmed through the System Connection Agreement /29/. The recalibration of these meters (electricity meters, gas analyzer and flowmeter) will be done in line with the equipment requirements and through the period defined by national metrology institutes country by country and for Türkiye this period is defined as 10 years. The calibration of meters is deemed appropriate and in compliance with the national regulation /18-19/. During on-site assessment, it was confirmed that the meters are in place and functions well. During the monitoring period, no breakdown has been recorded.
Findings	Please see CR1 of Appendix 3.
Conclusion	The monitoring parameter is “Quantity of net emission reductions as a result of electricity supplied to the grid” as per the registered monitoring plan presented in the registered PDD /1/. For the calculation of parameter, net electricity generation is monitored continuously as “MWh” by four electricity meters that are located at the project area. The meters have accuracy of 0.5s as confirmed through on-site visit. The accuracy class of the meters complies with the “Communiqué for Measurement Devices used in the Electricity Market” /18/. The electricity meters are sealed by TEIAS as confirmed during the site visit.

E.8. Assessment of data and calculation of emission reductions or net removals

E.8.1. Calculation of baseline GHG emissions or baseline net GHG removals by sinks

Means of verification	In accordance with the applicable methodologies the baseline is estimated as follows: Baseline Emissions $BE_y = BE_{CH4,y} + BE_{EC,y} + BE_{HG,y} + BE_{NG,y}$ BE_y = Baseline emissions in year y (t CO₂e/yr) $BE_{CH4,y}$ = Baseline emissions of methane from the SWDS in year y (t CO₂e/yr) $BE_{EC,y}$ = Baseline emissions associated with electricity generation in year y (t CO₂/yr) $BE_{HG,y}$ = Baseline emissions associated with heat generation in year y (t CO₂/yr) $BE_{NG,y}$ = Baseline emissions associated with natural gas use in year y (t CO₂/yr) Project activity does not include heat generation and natural gas use. Therefore; $BE_{HG,y} = 0$ $BE_{NG,y} = 0$ Thus, baseline emissions are; - Emissions of methane from the SWDS, - Emissions associated with electricity generation $BE_y = BE_{CH4,y} + BE_{EC,y}$ a. Emissions of methane from the SWDS $BE_{CH4} = ((1 - OX_{top_layer}) \times F_{CH4,PJ,y} - F_{CH4,BL,y}) \times GWP_{CH4}$ $BE_{CH4,y}$ = Baseline emissions of methane from the SWDS in year y (t CO₂e/yr) OX_{top_layer} = Fraction of methane in the LFG that would be oxidized in the top layer of the SWDS in the baseline (dimensionless) $F_{CH4,PJ,y}$ = Amount of methane in the LFG which is flared and/or used in the project activity in year y (t CH₄/yr) $F_{CH4,BL,y}$ = Amount of methane in the LFG that would be flared in the baseline in year y (t CH₄/yr) GWP_{CH4} = Global warming potential of CH₄ (t CO₂e/t CH₄)
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Since there is no regulatory or contractual requirement to destroy methane in the baseline;

$$F_{CH4,BL,y} = 0$$

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

$F_{CH4,PJ,y}$ = Amount of methane in the LFG which is flared and/or used in the project activity in year y (tCH₄/yr)

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

$F_{CH4,EL,y}$ = Amount of methane in the LFG which is used for electricity generation in year y (tCH₄/yr)

$F_{CH4,HG,y}$ = Amount of methane in the LFG which is used for heat generation in year y (tCH₄/yr)

$F_{CH4,NG,y}$ = Amount of methane in the LFG which is sent to the natural gas distribution network in year y (tCH₄/yr)

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

$$F_{i,t} = V_{t,db} \times V_{i,db,t} \times P_{i,t}$$

$$P_{i,t} = (P_t \times MM_i) / (R_u \times T_t)$$

$F_{i,t}$ = Mass flow of greenhouse gas i in the gaseous stream in time interval t (kg gas/h)

$V_{t,db}$ = Volumetric flow of the gaseous stream in time interval t on a wet basis (m³ dry gas/h)

$V_{i,t,db}$ = Volumetric fraction of greenhouse gas i in the gaseous stream in a time interval t on a wet basis (m³ gas i/m³ dry gas)

$P_{i,t}$ = Density of greenhouse gas i in the gaseous stream in time interval t (kg gas i/m³ gas i)

P_t = Absolute pressure of the gaseous stream in time interval t (Pa)

MM_i = Molecular mass of greenhouse gas i (kg/kmol)

R_u = Universal ideal gases constant (Pa.m³/kmol.K)

T_t = Temperature of the gaseous stream in time interval t (K)

$$F_{CH4,PJ,y} = \eta_{PJ} \times BE_{CH4,SWDS,y} / GWP_{CH4}$$

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

$BE_{CH4,SWDS,y}$ = Amount of methane in the LFG that is generated from the SWDS in the baseline scenario in year y (t CO₂e/yr)

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

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

$$BE_{CH4,SWDS,y} = \phi_y \times (1 - f_y) \times GWP_{CH4} \times (1 - OX) \times (16/12) \times F \times DOC_{f,y}$$

$$\times MCF_y \times \sum_{x=1} \sum_j (W_{j,x} \times DOC_j \times e^{-kj \times (y-x)} \times (1 - e^{-kj}))$$

$BE_{CH4,SWDS,y}$ = Baseline, project or leakage methane emissions occurring in year y generated from waste disposal at a SWDS during a time period ending in year y (t CO₂e/yr)

x = Years in the time period in which waste is disposed at the SWDS, extending from the first year in the time period ($x = 1$) to year y ($x = y$)

y = Year of the crediting period for which methane emissions are calculated (y is a consecutive period of 12 months)

$DOC_{f,y}$ = Fraction of degradable organic carbon (DOC) that decomposes under the specific conditions occurring in the SWDS for year y (weight fraction)

$W_{j,x}$ = Amount of solid waste type j disposed or prevented from disposal in the SWDS in the year x (t)

ϕ_y = Model correction factor to account for model uncertainties for year y (0.75)

f_y = Fraction of methane captured at the SWDS and flared, combusted or used in another manner that prevents the emissions of methane to the atmosphere in year y

GWP_{CH4} = Global Warming Potential of methane

	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) MCF_y = Methane correction factor for year y DOC_j = Fraction of degradable organic carbon in the waste type j (weight fraction) k = Decay rate for the waste type j j = Type of residual waste or types of waste in the MSW b. Emissions associated with electricity generation According to the methodological tool, baseline emission for electricity generation is calculated by multiplying the amount of electricity generated using LFG with carbon emission factor of the electricity source, which is the Turkish national grid. $BE_{EC,y} = \sum_k EC_{BL,k,y} \times FE_{EL,k,y} \times (1+TDL_{k,y})$ $BE_{EC,y}$ = Baseline emissions for electricity generation in year y (tCO₂/yr) $EC_{BL,k,y}$ = Quantity of electricity that would be generated using LFG in year y (MWh/yr) $FE_{EL,k,y}$ = Emission factor for electricity generation for source k in year y (tCO₂/MWh) $TDL_{k,y}$ = Average technical transmission and distribution losses for providing electricity to source k in year y BE_y for Project for this monitoring period: <table><tr><th>Parameter</th><th>Description</th><th>Verified BE (tCO_{2e})</th></tr><tr><td>BE_y</td><td>Baseline emissions</td><td>538,989</td></tr><tr><td>BE_{CH_4}</td><td>Baseline emissions of methane from the SWDS,</td><td>476,633</td></tr><tr><td>$BE_{EC,y}$</td><td>Baseline emissions associated with electricity generation</td><td>62,356</td></tr></table> Total baseline emission for MR: 538,989 tCO_{2e} verified through ER calculation spreadsheet /10/.	Parameter	Description	Verified BE (tCO _{2e})	BE_y	Baseline emissions	538,989	BE_{CH_4}	Baseline emissions of methane from the SWDS,	476,633	$BE_{EC,y}$	Baseline emissions associated with electricity generation	62,356
Parameter	Description	Verified BE (tCO _{2e})											
BE_y	Baseline emissions	538,989											
BE_{CH_4}	Baseline emissions of methane from the SWDS,	476,633											
$BE_{EC,y}$	Baseline emissions associated with electricity generation	62,356											
Findings	Please refer to CR 1 of Appendix 3												
Conclusion	RINA verified that the baseline emissions were calculated in accordance with the registered PDD and methodology ACM0001: Flaring or use of landfill gas - Version 19.0 /7/.												

E.8.2. Calculation of project GHG emissions or actual net GHG removals by sinks

Means of verification	In accordance with the applicable methodologies the baseline is estimated as follows: Project Emissions $PE_y = PE_{EC,y} + PE_{FC,y} + PE_{DT,y} + PE_{SP,y}$ PE_y = Project emissions in year y (t CO₂/yr) $PE_{EC,y}$ = Emissions from consumption of electricity due to the project activity in year y (t CO₂/yr) $PE_{FC,y}$ = Emissions from consumption of fossil fuels due to the project activity, for purpose other than electricity generation, in year y (t CO₂/yr) $PE_{DT,y}$ = Emissions from the distribution of compressed/liquefied LFG using trucks, in year y (t CO₂/yr) $PE_{SP,y}$ = Emissions from the supply of LFG to consumers through a dedicated pipeline, in year y (t CO₂/yr) $PE_{EC,y} = \sum_j EC_{PJ,j,y} \times EF_{EF,j,y} \times (1+TDL_{j,y})$
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	$PE_{EC,y}$ = Project emissions from electricity consumption in year y (tCO₂/yr) $EC_{PJ,j,y}$ = Quantity of electricity consumed by the project electricity consumption source j in year y (MWh/yr) $EF_{EF,j,y}$ = Emission factor for electricity generation for source j in year y (tCO₂/MWh) $TDL_{j,y}$ = Average technical transmission and distribution losses for providing electricity to source j in year y PE_y for Project for this monitoring period: <table><tr><th>Parameter</th><th>Description</th><th>Verified values</th></tr><tr><td>PE_y</td><td>Project emissions from electricity consumption</td><td>3 tCO_{2e}</td></tr><tr><td>$EC_{PJ,j,y}$</td><td>Quantity of electricity consumed by the project electricity</td><td>5 MWh</td></tr><tr><td>$EF_{EF,j,y}$</td><td>Emission factor for electricity generation</td><td>0.5552 tCO₂/MWh</td></tr><tr><td>$TDL_{j,y}$</td><td>Average technical and transmission and distribution losses for providing electricity</td><td>13.8 %</td></tr></table> Total project emission for MR: 8 tCO_{2e} verified through ER calculation spreadsheet /10/.	Parameter	Description	Verified values	PE_y	Project emissions from electricity consumption	3 tCO _{2e}	$EC_{PJ,j,y}$	Quantity of electricity consumed by the project electricity	5 MWh	$EF_{EF,j,y}$	Emission factor for electricity generation	0.5552 tCO ₂ /MWh	$TDL_{j,y}$	Average technical and transmission and distribution losses for providing electricity	13.8 %
Parameter	Description	Verified values														
PE_y	Project emissions from electricity consumption	3 tCO _{2e}														
$EC_{PJ,j,y}$	Quantity of electricity consumed by the project electricity	5 MWh														
$EF_{EF,j,y}$	Emission factor for electricity generation	0.5552 tCO ₂ /MWh														
$TDL_{j,y}$	Average technical and transmission and distribution losses for providing electricity	13.8 %														
Findings	NA															
Conclusion	RINA verified that the project emissions were calculated in accordance with the registered PDD and methodology ACM0001: “Flaring or use of landfill gas” /7/ .															

E.8.3. Calculation of leakage GHG emissions

Means of verification	The leakage emissions are assumed to be zero as per the ACM0001: "Flaring or use of landfill gas" /7/ as defined in the registered PDD /1/. Since the project and leakage emissions are zero, the emission reduction equals to baseline emissions – project emissions. Leakage The leakage emissions are neglected as per ACM0001 /9/.
Findings	N/A
Conclusion	Leakage was considered as zero in accordance with the applied methodology /7/ .

E.8.4. Summary of calculation of GHG emission reductions or net anthropogenic GHG removals by sinks

Means of verification	According to the applied methodology "ACM0001: Flaring or use of landfill gas - Version 19.0" /7/, the emission reductions have been calculated based on the following formula: $ER_y = BE_y - PE_y - LE_y$ Where: BE_y = Baseline emissions in year y (tCO_{2e}/yr) PE_y = Project emissions in year y (tCO_{2e}/yr) LE_y = Leakage emissions in year y (tCO_{2e}/yr) According to the applied methodology no leakage emission have been considered as emission due to project activity is landfill gas. Hence the emission reductions have been calculated as per above formula verified through ER calculation spreadsheet /10/: Emission Reduction The ex-ante emission reduction has been calculated as following equation in line with the ACM0001 /9/: $ER_y = BE_y - PE_y - LE_y$
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	All the documentation used by the project participants as the basis for assumptions and source of data are quoted and interpreted in the PDD and the Emission Reduction Calculation Spread Sheet /2 /.				
	ERy = BEy – PEy Hence:				
	*rounded down				
	Period	BE (tCO ₂ e)	PE (tCO ₂ e)	LE (tCO ₂ e)	Actual ER (tCO ₂ e) during current MP
	01/01/2022 – 30/03/2023 (both days included)	538,989	3	-	538,985 *
Findings	N/A				
Conclusion	The emission reduction calculations provided in the spreadsheet /9/ have been verified to be correct and in line with the registered PDD /1/ and applied methodology /7/.				

E.8.5. Comparison of actual GHG emission reductions or net anthropogenic GHG removals by sinks with estimates in registered PDD

Means of verification	The emission reductions from the project for the monitoring period (01/01/2022 – 31/03/2023 (both days included) (12+3 month) as reported in the monitoring report version 6.0 of 15/01/2025 /2/ is equivalent to 538,985 tCO ₂ . The reported emission reductions are higher than estimated emission reduction for the period 01/01/2022 – 30/03/2023 is equivalent 366,970 (12+3 month) as per the registered PDD /1/ verified through ER calculation spreadsheet /10/.
Findings	NA
Conclusion	Actual Emission reduction increased by 47% for the current monitoring period when compared with estimated emission reduction for the same monitoring period based on the PDD.

E.8.6. Remarks on difference from estimated value in registered PDD

Means of verification	The emission reductions from the project for the monitoring period (01/01/2022 – 31/03/2023 (both days included) (12+3 month) as reported in the monitoring report version 70 of 26/07/2025 /2/ is equivalent to 538,985 tCO ₂ . The reported emission reductions are higher than estimated emission reduction for the period 01/01/2022 – 30/03/2023 is equivalent 366,970 (12+3 month) as per the registered PDD /1/ verified through ER calculation spreadsheet /10/.
Findings	NA
Conclusion	Actual Emission reduction increased by 47% for the current monitoring period when compared with estimated emission reduction for the same monitoring period based on the PDD. Upon verification audit, it has been verified that the discrepancies between ex-ante and ex-post calculations stem from their reliance on different methodologies. The ex-ante calculations are based on the First Order Decay (FOD) model, which incorporates numerous default estimations. In contrast, ex-post calculations are grounded in actual measurements and readings. As per stated by PD one significant factor influencing these calculations is the efficiency of the gas collection system. The ex-ante model assumes a default efficiency value of 50% (nPJ), whereas audits have confirmed that the actual gas collection system operates with greater efficiency. The impact of this difference is limited and remains within acceptable sensitivity ranges. This is because the project's additionality is primarily based on financial indicators calculated from income, which is derived from the revenue generated by electricity production. Although the actual electricity generation was found to be 7% lower than anticipated, this variance is still within the range considered in financial projections.

E.8.7. Actual GHG emission reductions or net anthropogenic GHG removals by sinks during the first commitment period and the period from 1 January 2013 onwards

Means of verification	The emission reductions from the project for the monitoring period 01/01/2022 – 31/03/2023 as reported in the monitoring report version 6.0 of 15/01/2025 /2/ is equivalent to 538,985 tCO ₂ .
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Findings	NA
Conclusion	The actual monitoring period does not fall into the first commitment period.

E.8.8. Assessment of the sustainability parameters

Means of verification	The assessment of the monitored parameters is described in the tables below:		
	Data variable	Source of Data	Reported value for the project period
	Number of trainings, number of employments	Training files / SGK Records	32 people are employed during this monitoring period. All staff were trained on Health and Safety trainings.
	Assessment		
	<u>Number of trainings and number of employments:</u> This parameter is monitored by the SGK Records /23/ and Training Certificates /24/ of employees. Currently, it was confirmed that 32 employees are working during this monitoring period and all of them were attended to the Health and Safety Trainings.		
Findings	NA		
Conclusion	RINA verified that the GS indicators described in the monitoring report are accurate and real. Data to cross check the monitored parameters are available at the office of the company. Also, the registers of the sustainability indicators were available during the onsite inspection.		

SECTION F. Internal quality control

The final verification report before being submitted to the client is subjected to an independent technical review to confirm that all validation activities has been completed according to the pertinent RINA's procedures. The technical review will be/is performed by a technical reviewer(s) qualified in accordance with the RINA's qualification procedure.

SECTION G. Verification opinion

RINA Services Spa (RINA) has performed verification of the emission reductions reported for the project activity Landfill Gas Extraction and Electricity Generation, GS Registration Reference No. 11662 for the period 01/01/2022 – 30/03/2023, with regard to the relevant GS requirements and principles. The project participants are responsible for the preparation for the collection of data in accordance with the monitoring plan and the reporting emission reductions from the project. It is RINA's responsibility to express an independent verification opinion on the reported emission reductions from the project and does not express any opinion on the selected baseline scenario or on the validated and registered PDD. Based on documented evidences and corroborated by an on-site assessment RINA can confirm that: (i) the project has been implemented and operated as per the registered PDD; (ii) the monitoring report and other supporting documents provided are complete and verifiable and in accordance with the applicable GS requirements and principles; (iii) the monitoring is in place as per the applied baseline and monitoring methodology; (iv) the monitoring complies with the registered monitoring plan; (v) the monitoring plan in the registered PDD is as per the applied baseline and monitoring methodology.

SECTION H. Certification statement

It is RINA's opinion that the GHG emission reductions (GS VERs) stated in the latest version of monitoring report (version 6.0 of 15/01/2025) [/2/](#) for the project activity "Gazişehir LFG Utilization Project" for the period 01/01/2022 – 30/03/2023 are fairly stated. The GHG emission reductions (GS VERs) were calculated correctly on the basis of the approved monitoring methodology ACM0001: Flaring or use of landfill gas - Version 19.0 [/7/](#). Hence RINA is able to certify that the emission reductions from the project during the monitoring period 01/01/2022 – 31/03/2023, totally 538,985 tCO₂. In conclusion it is RINA's opinion that the project activity meets all the relevant GS requirements (GS VERs) for the verification of the 1st monitoring period (1st crediting period).

Appendix 1.**Abbreviations**

Abbreviations	Full texts
BE	Baseline Emissions
CAR	Corrective Action Request
CDM	Clean Development Mechanism
CDM M&P	Modalities and Procedures CDM
CER(s)	Certified Emission Reduction(s)
CH ₄	Methane
CR	Clarification Request
CO ₂	Carbon dioxide
CO ₂ e	Carbon dioxide equivalent
CRT	Coordination and Technical Control Staff
DCI	Certification Division of RINA Services Spa
DNA	Designated National Authority
VVB	Validation Verification Body
EB	Executive Board
ER	Emission Reductions
FAR	Forward Action Request
GHG(s)	Greenhouse gas(es)
GS4GG	Gold Standard for Global Goal
GWP	Global Warming Potential
IPCC	Intergovernmental Panel on Climate Change
LoA	Letter of Approval
MoV	Means of Verification
MR	Monitoring Report
NGO	Non-governmental Organization
ODA	Official Development Assistance
PDD	Project Design Document
PE	Project Emission
PP(s)	Project Participant(s)
Ref.	Document Reference
RINA	RINA Services Spa
SDG	Sustainable Development Goal
SS(s)	Sectoral Scope(s)
TA(s)	Technical Area(s)
TEIAS	Turkish Electricity Transmission Company (Türkiye Elektrik İletim A.Ş.)
EPIAS	Enerji Piyasaları İşletme A.Ş.
UNFCCC	United Nations Framework Convention on Climate Change
VVS	Validation and Verification Standard



**CERTIFICATO DI QUALIFICA
QUALIFICATION CERTIFICATE**

Si attesta che il sig.:
We declare that Mr:

Fulya Ekinci OZEN

è qualificato come¹:
is qualified as:

TL – VAL⁴ – VER – TEC – REG-EXP³ – ITRP

nello schema²:
for the scheme:

VCS – CCB – GS4GG

per le seguenti aree tecniche:
for the following technical areas:

1.2 – 3.1 – 13.1

AREE TECNICHE TECHNICAL AREAS	DESCRIZIONE DELL'AREA TECNICA TECHNICAL AREA DESCRIPTION	SCOPO SETTORIALE SECTORAL SCOPE
1.2	Renewables	1
3.1	Energy demand	3
13.1	Waste handling and disposal	13

in accordo alle istruzioni dell'Unità responsabile (OU) per sostenibilità & cambiamenti climatici.
in accordance with the instructions of the responsible unit (OU) for the sustainability & climate change.

REVISIONE REVISION	DATA DATE	MOTIVAZIONI PER LA REVISIONE REASON FOR THE REVISION
0	27/01/2017	First issue
5	06/12/2017	Update qualification as VAL
6	17/12/2023	Update technical area 3.1

Il Responsabile di schema
Scheme Manager

¹

VAL: Validator
VER: Verifier
TEC: Technical Expert
TL: Team Leader
FIN-EXP: Financial Expert
REG-EXP: Regional Expert
ITR: Independent Reviewer
DET: Déterminer

²

CDM: Clean Development Mechanism
VCS: Verified Carbon Standard
GS4GG: Gold Standard for Global Goals
SCS: SocialCarbon Standard
JI: Joint Implementation
ISO14064-2: International standard 14064 part 2
UER: Upstream Emission Reduction
CCB: The Climate, Community & Biodiversity Alliance

³ Turkey

⁴ For GS4GG only

RNA Services S.p.A. è accreditata da UNFCCC, quale Entità Operativa Designata (DOE), per condurre la Validazione e la Verifica di Progetti CDM, da VCSA per condurre la Validazione e la Verifica di Progetti VCS, da GS Foundation, per condurre la Validazione e la Verifica di Progetti GS, da Ecologica Institute per condurre la Validazione e la Verifica di rapporti SCS

RNA Services S.p.A. is accredited by the UNFCCC, as Designated Operational Entity (DOE), to carry out Validation and Verification of CDM Projects, by the VCSA, to carry out Validation and Verification of VCS Projects, by the GS Foundation, to carry out Validation and Verification of GS4GG Projects and by the Ecologica Institute, to carry out Validation and Verification of SCS Reports

GHG_QUAL_CERT_EN(06-2021)

Page 1 of 1



CERTIFICATO DI QUALIFICA
QUALIFICATION CERTIFICATE

Si attesta che il sig.:
We declare that Mr:

Mehmet ERDOGAN

è qualificato come¹:
is qualified as:

TL – VAL⁴ – VER – TEC – REG-EXP³ – ITR

nello schema²:
for the scheme:

VCS – CCB – GS4GG

per le seguenti aree tecniche:
for the following technical areas:

1.1 – 1.2 – 9.2 – 13.1 – 13.2

AREE TECNICHE TECHNICAL AREAS	DESCRIZIONE DELL'AREA TECNICA TECHNICAL AREA DESCRIPTION	SCOPO SETTORIALE SECTORAL SCOPE
1.1	Thermal energy generation	1
1.2	Renewables	1
3.1	Energy demand	3
9.2	Iron, steel and Ferro-alloy production	9
13.1	Waste handling and disposal	13
13.2	Manure	13

in accordo alle istruzioni dell'Unità responsabile (OU) per sostenibilità & cambiamenti climatici.
in accordance with the instructions of the responsible unit (OU) for the sustainability & climate change.

REVISIONE REVISION	DATA DATE	MOTIVAZIONI PER LA REVISIONE REASON FOR THE REVISION
0	24.03.2023	First Issue
1	12/04/2023	GS4GG extension
2	24/07/2023	GS4GG VAL extension
3	10/12/2023	TEC SS3 extension
4	31/01/2024	ITR extension

Il Responsabile di schema
Scheme Manager

¹
VAL: Validator
VER: Verifier
TEC: Technical Expert
TL: Team Leader
FIN-EXP: Financial Expert
REG-EXP: Regional Expert
ITR: Independent Reviewer
DET: Determiner

²
CDM: Clean Development Mechanism
VCS: Verified Carbon Standard
GS4GG: Gold Standard for Global Goals
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RNA Services S.p.A. is accredited by the UNFCCC, as Designated Operational Entity (DOE), to carry out Validation and Verification of CDM Projects, by the VCSA, to carry out Validation and Verification of VCS Projects, by the GS Foundation, to carry out Validation and Verification of GS4GG Projects and by the Ecologica Institute, to carry out Validation and Verification of SCS Reports.

GHG_QUAL_CERT_EN(06-2021)

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Appendix 3. Documents reviewed or referenced

No	Author	Title	References to the document	Provider
1	Oak Danismanlik	GS-PDD for “Gazişehir LFG Utilization Project”	version 7.0 of 04/07/2024	Project participant
2	Oak Danismanlik	Monitoring Report for “Gazişehir LFG Utilization Project”	version 1.0 of 17/07/2023 version 2.0 of 07/11/2023 version 3.0 of 01/11/2023 version 4.0 of 08/04/2024 version 5.0 of 08/08/2024 version 6.0 of 15/01/2025 version 7.0 of 26/07/2025	Project participant
3	GS4GG	GS4GG Standard Principle&Requirements	version 1.2 of 23/10/2019	Publicly available
4	GS4GG	GS4GG Standard Renewable Energy Activity Requirements	version 1.4 of 16/08/2021	Publicly available
5	GS4GG	GS4GG Safeguarding principles and requirements version 2.1	date of 29/06/2023	Publicly available
6	CDM Executive Board	Clean Development Mechanism Validation and Verification Standard	version 03.0 of 09/09/2021	Publicly available
7	CDM Executive Board	Baseline and Monitoring Methodology ACM0001: “Flaring or use of landfill gas”	version 19.0 of 14/06/2019	Publicly Available
8	CDM Executive Board	Methodological Tool “Tool to determine the remaining lifetime of equipment”	Version 01.0 of 16/10/2009	Publicly Available
9	RINA	Validation Report for “Gazişehir LFG Utilization Project – (combined Validation & Verification performed)	version 1.1Aa issued on 06/07/2024	Others
10	Oak Danismanlik	Calculation Spreadsheet named «GS 11662 URFA LFG Utilization Project ER Calc»	version 1.0 of 17/07/2023 Version 2.0 of 07/11/2023 Version 3.0 of 01/11/2023 Version 4.0 of 08/04/2024 version 5.0 of 08/08/2024 version 6.0 of 15/01/2025 version 7.0 of 26/07/2025	Project participant
11	GS4GG	GS4GG Monitoring Report Form	version 1.1 of 14/10/2020	Publicly available
12	CDM Executive Board	Tool 04 Emissions from solid waste disposal sites	Version 08.1 of 24/03/2023	Publicly available

13	CDM Executive Board	Tool to calculate the emission factor for an electricity system	Version 07.0 of 31/08/2018	Publicly available
14	CDM Executive Board	Tool 05 Baseline, project and/or leakage emissions from electricity consumption and monitoring of electricity generation	Version 03.0 of 22/09/2017	Publicly available
15	Energy Market Regulatory Authority	Generation License, No. EU/10239-1/04905	date of 27/05/2021	Project participant
16	CDM Executive Board	Investment analysis	Version 12.0 of 28/11/2019	Publicly available
17	Ministry of Energy and Natural Sources	Temporary Acceptance Protocols Gas Engines for GM1-GM2-GM3-GM4 GM7-GM8-GM9-GM10-GM11 GM5-GM6	Date of 29/06/2021 13/01/2022 11/03/2022 30/11/2022	Project Participant
18	The Ministry of Trade and Industry	Regulation of Metering and Testing of Metering Systems	date of 24/07/1994	Publicly available
19	Energy Market Regulatory Authority	Communiqué for Measurement Devices used in the Electricity Market	date of 22/03/2003	Publicly available
20	TEİAŞ / EPIAŞ (Elektrik Piyasaları İşletme A.Ş.)	Türkiye Electricity Distribution and Consumption Statistics, 1995-2020	Submitted on 07/11/2023	Project participant
21	TEİAŞ	State Regulated Automated Meter Reading System (OSOS) Records within the Monitoring Period	MP	Project participant
22	Enerji Piyasaları İşletme A.Ş. (EPIAŞ)	Monthly Electricity Records within the Monitoring Period	MP	Project participant
23	Social Security Institution	Social security records list of Employees	Date of 20/07/2023	Project participant
24	Birleşim Ortak Sağlık Güvenlik birimi	Certificates of each employee attendance for Health & Safety Training	date of 28/04/2022-29/04/2022	Project participant
25	Toroslar Elektrik Dağıtım A.Ş.	First Index	Date of 29/06/2021	Publicly Available
26	EPI & MRU AIR	EPI Calibration Document (sales order respectively SO21030502 – RO21041501-0) MRU AIR – gas analyser SWG100biogas	Date of 17/03/2021 10/05/2021 25/05/2021	Publicly Available
27	CDM Executive Board	Methodological Tool “Tool to calculate project or leakage CO2 emissions from fossil fuel combustion”	version 03.0.0 of 22/09/2017	Publicly Available
28	CDM Executive Board	Baseline and Monitoring Tool “Tool for the demonstration and assessment of additionality”	version 07.0 of 23/11/2012	Publicly Available
29	Toroslar Elektrik Dağıtım A.Ş.	System Connection Agreement	date of 27/10/2021	Project Participant
30	GS4GG	Validation & Verification Standard -QA and Answers	Date of 03/2023	Publicly Available

31	CDM Executive Board	Methodological Tool “Tool to determine the mass flow of a greenhouse gas in a gaseous stream”	version 03.0.0 of 27/11/2015	Publicly Available
32	GS4GG	GHG Emissions Reduction & Sequestration Product Requirements	version 2.3 of 29/04/2024	Publicly Available
33	Website: Argument: Language:	https://registry.goldstandard.org/projects/details/3784 GS4GG Registry English	Retrieved on: 05/08/2024	Publicly Available
34	Website: Argument: Language:	https://registry.terra.org/app/search/VCS/All%20Projects VCS Registry; English	Retrieved on: 05/08/2024	Publicly Available
35	Website: Argument: Language:	https://projects.globalcarboncouncil.com/ GCC Registry English	Retrieved on: 05/08/2024	Publicly Available
36	Website: Argument: Language:	https://tr.foton.energy/tr/power-plants Local IREC Issuer Turkish	Retrieved on: 05/08/2024	Publicly Available
37	Oak Danismanlik	Log book as part of the grievance mechanism	Date 16/04/2022 of	Project Participant

Appendix 4. Clarification requests, corrective action requests and forward action requests

Table 1. Remaining FAR from validation and/or previous verification

FAR ID		Section No.		Date:
Description of FAR				
-				
Project participant response				Date:
Documentation provided by project participant				
VVB assessment				Date:

Table 2. CR from this verification / validation

CR ID	1	Section no.	Date: 31/07/2023
Description of CR			
1- In excel sheet waste production is recorded since 1997 and the second lot is opened in 2021. Please share the evidence with VVB to prove that second lot has been active since 2021. 2- Please share EF link in spread sheet. 3- Please share details for all monitoring equipment such as electricity meter, flow meter with calibration and test reports in PDD and MR. 4- Please share evidence to proof gaseous stream flow temperature is below 60 °C for parameter ID.13.16. 5- In PDD it is stated that main source for electricity is TEİAŞ but EPIAŞ-PMUM values are shared for net amount of electricity generated and quantity of electricity consumed by the project activity parameters. Moreover, there is no statement about cross check of data in PDD. Please revise related sections (QA/QC) sections. 6- Please check ID.27 / TDL in PDD and also source of data because values have inconsistency with TEİAŞ publication. 7- In SG principles if Justification of Relevance is yes or potentially please add mitigation measures. 8- MP start date is 21/01 but for net electricity generation covers all days of 01/2021 (please see daily production AA70) please revise values. Also please be sure that values that is given in daily production excel sheet is net electricity values and round down values only for vintage values. 9- For SDG 8 trainings please add them under Section 8.8. 10- Sm3 transition is conducted via automatic counter (IPCC density is used) so please explain the density choice approach in PDD and MR. 11- Please add table source/description in MR page 20 12- For parameter ID.13.15 / vCH4,t,db value applied as %57 so please explain how to obtain this value. 13- For parameter ID.13.3 / nPJ values applied as %85 so please explain how to obtain this value with proofs. 14- Please correct and revise SDG Impact Tool. 15- Please use latest version of GS4GG template for PDD. 16- Please share the deviation request in PDD with response. 17- GS4GG Preliminary Review approval form should be shared with VVB. Calculations (Baseline and emission reduction calculation) and reports (PDD and MR) shall be amended according to the findings.			
Project participant response			Date: 31/10/2023

1. The landfill area was established in 1996 and receiving waste since then.
<https://webdosya.csb.gov.tr/db/ced/icerikler/gaz-antep-cdr2018-20200210112211.pdf> (Section C.1.)
The reference has been included in the PDD and excel is revised accordingly.
2. The emission factor is defined as per the official information note of Ministry of Energy and Natural Resources. The document could be reached under the following link. <https://enerji.gov.tr/evced-cevre-ve-iklim-turkiye-ulusal-elektrik-sebekesi-emisyon-faktoru> . The link has been provided under the revised PDD as well as the ER calculation sheet.
3. Initial calibration documents have been provided to the VVB and dates have been included in the revised Monitoring Report. In accordance with the applicable law (ölçü v) Electricity meter calibrations and gas meters have a calibration frequency of 10 years. Calibrations for all meters are within the validity period.
4. The Project uses Thermal Flow Meter. Thermal Flow Meters, an external heat source will heat the pipe or the fluid. Temperature field changes when the fluid flows through the pipe. Thermal flow meter measures the relationship between the energy required to increase the temperature of a fluid and the mass of the fluid to measure the mass flow of the fluid. The flowmeters directly measure normalized volume flow of gases without any additional pressure and temperature compensation. Generally, thermal flow meter used to measure the normalized volume flow of a gas (like LFG gas).
The PDD has been revised also to follow Option C rather than Option A as referred under Table 6 (Measurement options for Fi,t). MR report has been revised as well to reflect the revisions accordingly.
5. There are two official and viable sources where the meter readings could be extracted from. One is the State Regulated Automated Meter Reading System (OSOS) and the other source is the monthly protocols confirmed by the distribution company. For clarity, State Regulated Automated Meter Reading System will be considered as the main source for this parameter while monthly protocols could be used for cross check. This explanation has been provided under the revised versions of both PDD and MR. Also ER Calculation Sheet has been revised accordingly.
6. Source for parameter has been revised to TEIAS statistics (<https://webim.teias.gov.tr/file/01638a5d-94aa-484b-9c48-b4c86fa99469?download>) Ex ante and MR calculations have been revised accordingly.
7. Editorial errors have been corrected. Under the safeguard principles #2.
8. The gas readings start on 21/01/2022. For practicality, the beginning of the year 01/01/2022 has been set as the start of crediting period. All documents have been revised accordingly.
9. Health and safety trainings have been added as a monitoring parameter. PDD and MR have been revised accordingly.
10. The Project uses Thermal Flow Meter. Thermal Flow Meters, an external heat source will heat the pipe or the fluid. Temperature field changes when the fluid flows through the pipe. Thermal flow meter measures the relationship between the energy required to increase the temperature of a fluid and the mass of the fluid to measure the mass flow of the fluid. The flowmeters directly measure normalized volume flow of gases without any additional pressure and temperature compensation. Generally, thermal flow meter used to measure the normalized volume flow of a gas (like LFG gas).
The PDD has been revised also to follow Option C rather than Option A as referred under Table 6 (Measurement options for Fi,t). MR report has been revised as well to reflect the revisions accordingly.
11. MR has been revised accordingly
12. The value is the average of hourly readings and presented as a representative number. Please refer to the ER calculation sheet for hourly readings. Explanation has been provided in the revised MR.
13. Since the actual methane collection of the Project Activity is known, the collection efficiency could be estimated based on the actual figures. Therefore 70% is used.
14. Impact tool has been revised.
15. The PDD format has been updated to v1.5
16. Details on deviation has been provided under the revised version of the PDD.
17. Review form has been shared with the VVB. Also PDD is revised to include communication of how comments from GS has been taken into account.

Documentation provided by project participant	
VVB assessment	Date: 15/11/2023

1- Excel sheet input-waste LFG and output avoid methane LFG sections it is not so clear why waste acceptance and LFG generation start from 1997 while lot has been active since 2021. Please share only results for MP and related values and other information can be frozen. It is understood that waste projection is taken from one source please share the source of data. Related link doesn't cover waste projection-waste fraction etc.. 2- OK. 3- In MR calibration dates of electricity meter, flow meter and gas analyzer is shared but evidences is not shared with VVB. Moreover it is advised to create an table and show all monitoring equipment here with calibration dates. 4- ID 13.17, 13.18 why condition changes from dry to wet. Option A "Demonstrate that the temperature of the gaseous stream (Tt) is less than 60°C (333.15 K) at the flow measurement point. 24. If it cannot be demonstrated that the gaseous stream is dry, then the flow measurement should be assumed to be on a wet basis and the corresponding option from Table 2 should be applied instead." Moreover A) Table 2 Summary of monitoring results for this monitoring period there is no reference link. Also for calculation of mass flow it is not clear how to calculate density of gas, please show all calculation in excel sheet. B) Moreover as stated "The Project will use a flow meter directly measure normalized volume flow of gases (Vt,wb,n) without any additional pressure and temperature compensation so PP shall demonstrate that how flow meter directly normalize the values and please share the evidence. 5- In excel sheet it is not clear the main source and cross check source. Please classified as main-cross check. Also please share deviation between TEİAŞ and OSOS records and be sure that if deviation is more than %1 use TEİAŞ value. 6- OK. 7- SG Principles are corrected it is verified but when all clauses are closed, SG principles will be reviewed again. 8- Please share the evidence of 21/01/2021 date for gas reading-collection. 9- OK. 10- Same as Clause 4. Please clarify how to get direct-normalized values from flow meter. 11- OK. 12- It is clear now. But please share tools number and titles on source of Date for all monitoring parameters. 13- Please share the reference of data. 14- OK 15- OK. Template will be controlled again when all corrections are applied. 16- Please mention deviation request in PDD. "The validating VVB shall, through appropriate means at its disposal, evaluate the information and provide its opinion in the Validation Report". 17- Please detail SFR in PDD also share the evidences with VVB by regarding GS4GG requirements.	
Project participant response	Date:

1. Please note the difference between ex-ante estimation and ex-post calculations of baseline emissions. This is due to ACM0001 (please refer to par. 3 (a) of Tool 4). Ex-Ante uses FOD model to estimate the methane generation based on assumptions, while ex-post calculates baseline emissions based on the actual destroyed methane based on monitored parameter. The excel with excel with “input-waste LFG” and “output avoid methane LFG” are relevant to ex-ante estimations, hence the question on only to share Monitoring Period relevant results is not applicable.

A Lot refers to a portion of the landfill, however there are no physical boundaries between one another. Therefore, from a baseline perspective (taking into account the baseline describes the scenario where there is no project activity implemented), the start of the waste accumulation is considered as the start of landfill site. The VVB should also note the requirement under par 38 (b) of ACM0001 V19, which requires “*In the tool, x begins with the year that the SWDS started receiving wastes (e.g. the first year of SWDS operation)*”, which is 1996.

The waste amount projection is based on TUIK database

<https://biruni.tuik.gov.tr/medas/?kn=119&locale=tr> Reference has been added to the PDD. Please note the yearly collected amount of waste for Gaziantep is 1870 t/y. Ex-Ante calculation has been revised to take into account this figure.

The projection (past and future) is based on annual growth rate of the Gaziantep population. Since MSW has a linear link to the population, this provides a conservative estimation.

2. N.A.

3. The documents were shared during the site visit. The PP has provided the copies again as an attachment to this round for convenience. Information on quality and assurance is presented under the fixed table formats under section D.2. A summary of calibration information has been provided here as follows:

Equipment and description	Parameter	Calibration Date
Volumetric flow meter of the gaseous stream in time interval t on a wet basis	ID.13.17 / Vt,wb	Calibration has been conducted on 17/03/2021 Accuracy Specifications are as follows: +/- 1%
Gas analyser for volumetric fraction of CH ₄ in a time interval t on a wet basis	ID.13.18 / vCH ₄ ,t,wb	Calibration has been conducted on 25/05/2021 Accuracy Specifications are as follows: +/- 1.8%
Electricity meters for Net amount of electricity generated and consumed	ID.13.20 / ECBL,y & ECPJ,y	Electricity meters are checked, installed and sealed to the site by TOROS Elektrik Dağıtım A.Ş. which is the Distribution Company on 29/06/2021 (Meter initial installation protocol is available to the VVB).

4. The 2nd round question of the VVB is not clear to the PP. The PDD has been already revised to carry out option C under table 2 in line with the Applicable Tool. Choice of measurement is an option for the PP and PP opts to go forward with option C. As discussed, option C is applicable to the Project. The second portion of the question is assumed to be related with the Monitoring Report.

Table 2 of the Monitoring Report “Summary of monitoring results for this monitoring period” is a summary of all the calculations presented to the VVB in the excel format and explained in the Monitoring Report. The calculation of the density is now clarified under the ER EXCEL. Please refer to raw Z.

- Project uses EPI Series 540 Inline thermal mass flow meter that provides real-time flow measurement with a sensor that is both temperature and pressure corrective. Thermal Mass Flow Meters measure the mass flow of a fluid. An external heat source will heat the pipe or the fluid. Temperature field changes when the fluid flows through the pipe. Thermal mass flow meter measures the relationship between the energy required to increase the temperature of a fluid and the mass of the fluid to measure the mass flow of the fluid. Reference has been provided.
5. The excel has been revised accordingly. Now the OSOS is stated as Main Source. Also the function is now corrected to take into account OSOS reading if the difference is below 1%.
 6. N.A.
 7. N.A.
 8. The RAW file has been shared with the VVB.
 9. N.A.
 10. Project uses EPI Series 540 Inline thermal mass flow meter that provides real-time flow measurement with a sensor that is both temperature and pressure corrective. Thermal Mass Flow Meters measure the mass flow of a fluid. An external heat source will heat the pipe or the fluid. Temperature field changes when the fluid flows through the pipe. Thermal mass flow meter measures the relationship between the energy required to increase the temperature of a fluid and the mass of the fluid to measure the mass flow of the fluid. Reference has been provided.
 11. N.A.
 12. There are no tools referred for monitored parameters.
 13. The reference is the 1st Monitoring Report and all documents shared with the VVB. Monitoring Report covers the actual methane destructed in the monitoring period.
 14. N.A.
 15. N.A.
 16. The request is for the VVB and related with the Validation Report and Verification Report.
 17. PDD has been revised accordingly.

Documentation provided by project participant

Set of documents have been provided to the VVB as Annex.

VVB assessment

Date: 26/03/2024

- 1- Explanation is found reasonable.
- 3- In addition to the system connection agreement please share the system usage agreement and control test frequency for electricity meter there.
- 4- OK
- 5- Main and cross check values are controlled and verified. But please update ID.13.20 / ECBL,y and ID.13.20 / ECBL,y according to CP and MP. Also please explain the reason of difference of estimated and actual values.
- 7- OK.
- 8- OK
- 10- OK.
- 12- OK
- 13- Please review the parameter again. Parameter means collected LFG/Total produced LFG. ACM 001 default value is %50. If %70 is chosen it should be provided clearly.
- 16- OK.
- 17- OK.

New Comment 18- Please share:

- EIA report etc.
- no double accounting commitment,
- cover letter with VVB.

Project participant response

3. System usage agreement is shared with the VVB. There are no test frequency requirements mentioned. The PP adopts 10 year calibration frequency for the meters which is in line with the Turkish Legislation.	
5. The MP and CP starts on 01/01/2022 and ends on 31/03/2023. With a total net electricity of 98,693 MWh net generation and 5 MWh consumption. MR is accurate. Excel sheet has been revised by excluding electricity generation information after May 2023 to avoid ambiguity.	
MR has been revised to include explanation on difference in ex-ante-and ex-post calculations.	
13. The ex-ante excel is now using the default value of 50%. Excel and PDD has been revised accordingly.	
18. Documents are now shared with VVB.	
Documentation provided by project participant	
Set of documents have been provided to the VVB as Annex.	
VVB assessment	Date: 19/04/2024
3- OK.	
5- Approved.	
13- Approved.	
New Comment 18- OK.	
Hence, CR 1 is closed.	

Table 3. CAR from this verification / validation

CAR ID	1	Section no.	B.4	Date: 31/07/2023
Description of CAR				
1- Link to the website of Bilkent University Report is not working – error code 404 (page not found). Unit investment costs cannot be verified. Please provide working web-link. 2- Equity/loan ratio of 80/20% cannot be defined as a default value. In case this value is a typical in the sector, please provide justification as per paragraph 26 of Tool 27. Tool 27: Investment analysis recommends in case loan structure is not yet available to use a default equity/loan ratio of 50/50 (paragraph 25). 3- Interest rate of 6% and repayment period of 5 years are not justified and no evidence is included. Please provide reference at the time of investment decision taking for the loan parameters. 4- Unit O&M expenses cannot be verified – the link to the website of Bilkent University Report is not working – error code 404 (page not found). 5- Plant load factor (PLF) of 6300 annual working hours is not justified as per CDM EB48 Report, Annex 11-Guidelines for the reporting and validation of plant load factor. Please provide additional justification of the estimated PLF. 6- The equity IRR calculated as -7% is negative meaning that the investment will be at constant loss and, in fact, the project should not be implemented. Please provide additional explanation of why the PP proceeds with the project regardless of that fact. If the project relies on some kind of additional financial support from the municipality or the state, this cash in-flow should be included in the analysis. 7- The sensitivity analysis presented in the PDD is not sufficiently clear and transparent. The result of the different variations is not presented. 8- The estimated lifetime of the project is defined as 25 years but the investment analysis is made for 15 years. According to CDM Tool 27:Investment analysis, if a shorter period than the technical lifetime is chosen, the investment analysis shall be conducted for at least 10 years and include the fair value of the project activity assets at the end of the assessment period. The fair value should be estimated as per the requirements of paragraph 7 of the Tool. 9- The value of the electricity tariff is not justified. Since 2021 the Turkish government guarantees special feed-in tariffs for renewable energy plus possibility for local premium, for the first 10 years of project operation. Please provide justification of the tariff applied for the whole period of the investment analysis. 10- The item “Other variable costs” cannot be verified. Link to the website of Bilkent University Report is not working. Please provide working web-link. 11- The value of installed capacity applied in the IRR calculation sheet is decreased to 5.82 starting year 11 and net electric energy generated is correspondingly lower but the number of working units is still 11. Please provide explanation. 12- A reference link to the Project Appraisal Document of World Bank to TSKB (Turkish Industrial Development Bank) is missing. Please provide relevant link to the referred document. 13- The type of the equity IRR and the benchmark (pre/post taxes) is not clearly defined in the PDD. Please include a clear statement. 14- The type of electric energy generated (gross/net) is not clearly defined in Table 3 of the PDD.				
Project participant response				Date: 31/10/2023

1. The editorial mistake has been revised. The reference is the MMO (Makina Muhendisleri Odası) Publication Energy Investments Cost Analysis.
https://www.mmo.org.tr/sites/default/files/14c4511b3c98f14_ek.pdf has been added
2. Recent study of SHURA Report “Financing Energy Transition in Turkey” indicate RE investments in Turkey show a higher share of loan/equity with an average of 70-80%. Reference:
<https://shura.org.tr/wp-content/uploads/2019/10/SHURA-2019-10-Turkiyede-Enerji-Donusumunun-Finansmani.pdf> The PDD has been revised to include a reference.
3. The interest rate is revised to 3%. The data has been based on Central Bank of Turkey Electronic Data Delivery System
(https://evds2.tcmb.gov.tr/index.php?evds/serieMarket/collapse_13/5936/DataGroup/turkish/bie_abres2/) using Euro based Commercial Lending Rates Data sets for year 2021 averages (TP KTF17 EUR). 2021 is the year of investment decision.
4. The editorial mistake has been revised. The reference is the MMO (Makina Muhendisleri Odası) Publication Energy Investments Cost Analysis.
https://www.mmo.org.tr/sites/default/files/14c4511b3c98f14_ek.pdf has been added
5. Since the actual electricity generation is known, the load factor could be estimated based on the actual figures. Therefore 6300 h annual working hours is used to represent a yearly average.
6. The project does not rely on the additional financial support from the municipality or the state, this cash in-flow. It is also true that the project activity is not financially attractive, which is in line with the definitions and requirements of additionality.
7. The applicable tools require a sensitivity analysis that shows whether the conclusion regarding the financial/economic attractiveness is robust to reasonable variations in the critical assumptions. The PDD presents test of equity IRR when critical parameters are changed by 10% when changed in favor of a higher IRR. The result table provides IRR values as a result of each changed parameter and the value of the parameter. Financial Analysis J26 – J29 allows to increase or decrease parameters by a given percentage change and IRR is calculated automatically. The PDD has been revised to include some further clarification on the approach. Results are already presented under Table 5 under Sensitivity Analysis of the PDD.
8. The expected operational lifetime of the project activity is revised to 17 years. The operational lifetime reflects (Section C.1.2) how many years is the project activity is allowed to operate. This is reflected in the Generation License as 2038 (already shared with the VVB).

The financial analysis is now revised to 10 years based on the comments of the VVB and the requirements of the applicable tool(s). In accordance with “Tool to determine the remaining lifetime of equipment”, the technical lifetime of a gas fired generator set is determined as 50.000 hours as a conservative approach. Looking to industry standards the technical lifetime could be also extended to 80.000 hours (https://www.jenbacher.com/en/news-media/media-center?task=download&file=seb_media_file&id=854). Based on the 6300 h annual operation, the technical lifetime of the component can be calculated within a range of 8 – 13 years. Also taking into account the minimum analysis period of 10 years under Tool 27 on investment analysis, the IRR calculation is now revised to cover 10 years investment horizon. No fair value has been considered since it passes the default technical lifetime.

9. In accordance with EB 22 Annex 3 the following definition and clarifications apply for baseline and additionality:
National and/or sectoral policies or regulations that identify as “E- Policies” that have been implemented since the adoption by the COP of the CDM M&P (decision 17/CP.7, 11 November 2001) need not be taken into account in developing a baseline scenario (i.e. the baseline scenario could refer to a hypothetical situation without the national and/or sectoral policies or regulations being in place). In accordance with EB 16 Annex 3 E- Policies defined as National and/or sectoral policies or regulations that give positive comparative advantages to less emissions-intensive technologies over more emissions-intensive technologies (e.g. public subsidies to promote the diffusion of renewable energy or to finance energy efficiency programs).
The 10 year Guaranteed Feed in Tariff for Renewable Energy is a clear E- Policy which was based on Law No. 5346 on Generation of Electricity from Renewable Energy Resources enacted after 11 November 2001. Therefore the financial analysis was based on 2021 average wholesale price for electricity.

The PP would like to also highlight the timeline of the Renewable Energy Law. Enacted in 2015 the Law was applicable till 31/12/2020 and it was only extended for 6 months twice by a Precedential Decree. Considering the investment decision was determined in 2021, the applicability of the Law was not definite.

10. The editorial mistake has been revised. The reference is the MMO (Makina Muhendisleri Odası) Publication Energy Investments Cost Analysis. https://www.mmo.org.tr/sites/default/files/14c4511b3c98f14_ek.pdf has been added 11. Document have been revised accordingly. 12. Document is accessible from https://documents1.worldbank.org/curated/en/799701498842988254/pdf/ICR00004069-06192017.pdf PDD has been revised to include the link as reference. 13. The Equity IRR is calculated with post tax cash flows. The WB reference also indicates “Costs considered in the FRR analysis include capital costs and incremental O&M expenses, including applicable taxes and duties”. Necessary clarifications have been added to the PDD. 14. The figure is net generation. PDD has been revised to include the information.	
Documentation provided by project participant	
VVB assessment	Date: 11/10/2023
1- A working link has been presented in the revised PDD. ISSUE IS CLOSED. 2- The PP has added a reference to the applied equity/loan ratio of 80/20 % in the revised PDD. ISSUE IS CLOSED. 3- The estimated interest rate of the loan has been revised to 3% referring to information based on Central Bank of Turkey Electronic Data Delivery System. ISSUE IS CLOSED. 4- The link to the website of Bilkent University Report has been repaired referring to the unit O&M expenses. ISSUE IS CLOSED. 5- The value of the Plant Load Factor applied to the project based on 6300 working hours annually has been justified by the PP. ISSUE IS CLOSED. 6- The purpose of the equity IRR calculation is to determine the final return on the initial equity investment (TOOL 27: Investment analysis, paragraph 14). The equity IRR calculated at -13% demonstrates that the project is at loss during the whole period and is not able to return the invested capital. Still the PP insists with the implementation of the project in any case. Please clarify. 7- Furthermore: • The PP has revised the investment analysis period to 10 years yet the IRR calculation workbook is presented for 15 years. Please delete extra columns. • No value is presented in cell L78 that gives a wrong value for the IRR. Please revise the IRR calculation table and the PDD. ISSUE IS OPEN 8- The Sensitivity analysis has been presented properly in the revised PDD. ISSUE IS CLOSED. 9- The Operational lifetime of the project has been revised to 17 years as per the Generation License. The financial analysis has been done for a 10 years period. However, the technical lifetime of the project is defined at the range of 8-13 years, which covers the investment analysis period so no fair value of the equipment is expected at the end of the period. ISSUE IS CLOSED. 10- The PP has presented a reliable justification of the electricity tariff applied to the investment analysis. ISSUE IS CLOSED. 11- The Internet link referring to the value of the variable costs has been repaired and is working. ISSUE IS CLOSED. 12- The period of the investment analysis has been revised to 10 years. ISSUE IS CLOSED. 13- The link has been repaired and is working. ISSUE IS CLOSED. 14- The equity IRR used as a financial indicator has been stated as post-tax equity IRR. ISSUE IS CLOSED. 15- Electricity generated by the project and stated in Table 4 of the PDD is clearly stated as “net”. ISSUE IS CLOSED.	
Project participant response	Date:

6- TOOL 27 Investment analysis, paragraph 14 is related which portion of the investment cost to be taken into the calculations of Equity IRR (equity vs debt). The IRR calculation already conducted in line with this requirement. However it does not refer to any guidance on CDM revenues to be taken into account or not during the IRR calculations. This is referred under EB69 Annex 21.

It is true that the project activity is not financially attractive, which is in line with the definitions and requirements of additionality. In line with the requirements of the methodology the additionality is defined in combination of a baseline and additionality exercise simultaneously. The tool requires identification of alternative scenarios available for the project activity and analysis. The investment scenario is used to identify the most plausible investment decision among the alternative investment decisions available to project participants without the CDM (Please refer to EB69 Annex 21 definitions to investment scenarios). The investment scenario leads to the determination of the baseline. In the project case there are 2 viable project scenarios: A) Project activity including power generation from LFG without being registered as a VER project activity; and B) Atmospheric release of the LFG and electricity would have been generated by the existing grid connected power plants as continuation of the situation before the project activity. Demonstrating (A) through investment analysis is not a viable choice for the investor is satisfactory to determine the Baseline as well as to prove additionality.

The investment decision of the PP could be based on several factors and assumptions including but not limited to the expectations on the future Carbon Credit Value, which is very volatile by nature and represented in a wide spectrum. However, the expectations on carbon credit value reaches to significant values over time based on even the most skeptical analysis.

7- Extra columns are now deleted. L78 is now corrected. PDD has been revised accordingly.

Documentation provided by project participant	
VVB assessment	Date: 19/04/2024
6. PP's explanation and justification is deemed sufficient. ISSUE IS CLOSED. 7. ISSUE IS CLOSED. Hence, CAR 1 is closed.	

Table 4. FAR from this verification / validation

FAR ID		Section No.		Date:
Description of FAR				
Project participant response				Date:
Documentation provided by project participant				
VVB assessment				Date:

Document information

<i>Version</i>	<i>Date</i>	<i>Description</i>
01.0	10/06/2016	Initial publication.