

GOLD STANDARD FOR THE GLOBAL GOALS (GS4GG) REPORT

-

DESIGN CERTIFICATION (RENEWAL)



Project Title: Bursa-Hamitler Landfill Gas Collection and Energy Utilization Project
GS project ID: GS 1068
Internal ID: 4822
Customer: ITC-KA Enerji Üretim Sanayi ve Ticaret A.Ş.
Date: 02/11/2022
Revision: 02

SUMMARY			
Reference No.	Date (first version)	Version No.	Date (last version)
A+SH_SYST_TQC_GS_VER_RCP_4822	03/10/2022	01	01/11/2022
Client	ITC-KA Enerji Üretim Sanayi ve Ticaret A.Ş.		
Project Title	Bursa-Hamitler Landfill Gas Collection and Energy Utilization Project		
Project Participants	ITC-KA Enerji Üretim Sanayi ve Ticaret A.Ş.		
Project Location	Bursa, Marmara Region, Bursa Province, Turkey		
Contact Person	Mr. Ali Kantur		
GS4GG Version: GS4GG GS4GG Activity Requirements: RE Activity Requirements, version 1.4 ^{1/9/} Applied Methodology: - ACM0001 “Flaring or use of landfill gas” Version 19.0 ^{1/7/} The following tools and guidance’s have been followed (References): - “Combined tool to identify the baseline scenario and demonstrate additionality”, version 07.0.0 ^{2-/8/} - “Emissions from solid waste disposal sites” Version 08.0 ^{3; /9/} - “Tool to calculate the emission factor for an electricity system” Version 07.0 ^{4; /11/} - “Baseline, project and/or leakage emissions from electricity consumption and monitoring of electricity generation” Version 03.0 ^{5/10/} - “Assessment of the validity of the original/current baseline and update of the baseline at the renewal of the crediting period” Version 03.0.1 ^{6 /14/} - “Tool to determine the mass flow of a greenhouse gas in a gaseous stream” version 03.07 ^{8/12/}		GS4GG Sectoral Scope: 2 UNFCCC CDM Sectoral Scope: 1, 13 Technical Area: 1.2 and 13.1	
GS4GG First PDD Version: 01 Date: 01/08/2022			
		GS4GG Final PDD Version: 05 Date: 21/10/2022	
Estimated Annual SDG Impacts:			

¹ https://cdm.unfccc.int/filestorage/H/E/J/HEJ2MD41GB0PUZISL9FNTAYQV38750/EB103_repan01_ACM0001.pdf?t=eUN8cjV5MGZnfDAabQLL4NdryNmRzDKWoRF

² <https://cdm.unfccc.int/methodologies/PAmethodologies/tools/am-tool-02-v7.0.pdf>

³ <https://cdm.unfccc.int/methodologies/PAmethodologies/tools/am-tool-04-v8.0.pdf>

⁴ <https://cdm.unfccc.int/methodologies/PAmethodologies/tools/am-tool-07-v7.0.pdf>

⁵ <https://cdm.unfccc.int/methodologies/PAmethodologies/tools/am-tool-05-v3.0.pdf>

⁶ <https://cdm.unfccc.int/methodologies/PAmethodologies/tools/am-tool-11-v3.0.1.pdf>

⁷ <https://cdm.unfccc.int/methodologies/PAmethodologies/tools/am-tool-08-v3.0.pdf>

⁸ <https://cdm.unfccc.int/methodologies/PAmethodologies/tools/am-tool-08-v3.0.pdf>

Sustainable Development Goals Targeted	SDG Impact	Estimated Annual Average
SDG 13 Take urgent action to combat climate change and its impacts	Reduction of greenhouse gas emission	261,180 ⁹ tCO ₂ /year (GS VER)
SDG 7 Ensure access to affordable, reliable, sustainable and modern energy for all	Electricity generated using landfill gas	68,600 MWh/year
SDG 8 Promote sustained, inclusive and sustainable economic growth, full and productive employment and decent work for all	Employment generated due to the project activity	05 workers employed will be continued during the crediting period and at least 1 training will be conducted

Selected Sustainable Development Goals (SDGs): 7; 8; 13

Design Certification Summary

LGA Technological Center, S.A. (hereafter referred to as Applus+ Certification) has been contracted by ITC-KA Enerji Üretim Sanayi ve Ticaret A.Ş. to perform the GSVER validation (Renewal of GS Crediting Period) of "Bursa-Hamitler Landfill Gas Collection and Energy Utilization Project" applying the UNFCCC approved methodology – ACM0001 version 19.0^{/7/}.

The management of ITC-KA Enerji Üretim Sanayi ve Ticaret A.Ş. is responsible for the preparation of the GHG emissions data and the reported GHG emission reductions.

A desk review, remote audit, document review has been conducted to verify the data submitted in the GS4GG PDD. Applus+ Certification confirms the following have been reviewed:

- Registered PDD of first crediting period ^{/1/} and the corresponding validation report ^{/2/}
- The applied monitoring methodology^{/7/};
- Relevant decisions, clarifications and guidance from the CMP and the CDM Executive Board^{/15//16/};
- The Gold Standard for Global Goals "Principles and Requirements" Version 1.2^{/17/}
- All information and references relevant to the project activity's resulting in estimated emission reductions.

The scope of the RCP validation is defined as an independent and objective review of the project design document, against the Kyoto Protocol requirements, GS4GG guidelines, UNFCCC rules, applicable CDM requirements and requirement of Gold Standard. The validation report is finalized based on the assessment of the Gold Standard GS4GG PDD, and applying standard auditing techniques including but not limited to document review, follow up actions (e.g., Remote audit, telephone or e-mail interviews) and also the review of the applicable approved methodology and underlying formulae and calculations.

The report and the annexed validation checklist describe a total of 05 findings which include:

- 04 Corrective Action Requests (CARs);
- 01 Clarification Requests (CLs/CRs);
- 00 Forward Action Requests (FARs)

The Project Developer (PD) has responded these findings by modifying the Gold Standard GS4GG PDD and providing adequate additional explanations and evidences. Applus+ Certification confirms that all the findings have been "closed out" before submitting the request for renewal to GS board (Renewal of Crediting period).

⁹ Average for the crediting period

As a summary of the RCP validation, the review of the Gold Standard GS4GG PDD and the subsequent follow-up interviews have provided Applus+ Certification with sufficient evidence for the determination of the project's fulfillment with all stated criteria. In our opinion, the project meets all relevant UNFCCC requirements for the CDM and requirement of Gold Standard. Therefore, Applus+ Certification recommends the project for renewal of crediting period by the GS Registry as GSVER project.

ASSESSMENT TEAM		
Team Members	Type of Resource ¹⁰	Organization (for OEs)
Lead Auditor: Mr. Pankaj Kumar	☐ IR ☐ EI ☒ OE	M/s True Quality Certifications Private Limited
Technical Expert: Mr. Pankaj Kumar	☐ IR ☐ EI ☒ OE	M/s True Quality Certifications Private Limited
Technical Reviewer: Mr. Simon Shen	☐ IR ☒ EI ☐ OE	-

¹⁰ IR (Internal Resource); EI (External Individual); OE (Outsourced Entity)

ABBREVIATIONS	
AMS	Approved Methodology Small Scale
Applus+ LGAI / Applus+	LGAI Technological Center, S.A. (Applus+ Certification)
BM	Build Margin
CAR	Corrective Action Request
CDM	Clean Development Mechanism
CDM EB	CDM Executive Board
CER	Certified Emission Reduction
CL / CR	Clarification Request
CM	Combined Margin
CMP	Conference of the Parties serving as the Meeting of the Parties to the Kyoto Protocol
DNA	Designated National Authority
EF	Emission Factor
EIA	Environmental Impact Assessment
ER	Emission Reductions
FAR	Forward Action Request
GHG	Greenhouse Gas(es)
GS4GG (or GS)	Gold Standard for Global Goals
IPCC	Intergovernmental Panel on Climate Change
KP	Kyoto Protocol
MP	Monitoring Plan
NGO	Non-Governmental Organization
RCP Validation	Validation for Renewal of Crediting Period
SDG	Sustainable Development Goal
TAC	Gold Standard Technical Advisory Committee
OM	Operational Margin
PP	Project Participant
PS	Project Standard
PPA	Power Purchase agreement
UNFCCC	United Nations Framework Convention for Climate Change
VVB	Validation and Verification Body
VVS	CDM validation and verification standard for project activities, Version 02.0
TEIAS	Turkish Electricity Transmission Company
EMRA	Energy Management Regulatory Authority

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1. INTRODUCTION

ITC-KA Enerji Üretim Sanayi ve Ticaret A.Ş. has commissioned Applus+ Certification to perform RCP validation of “Bursa-Hamitler Landfill Gas Collection and Energy Utilization Project” (hereafter referred to as the project activity). This validation report summarizes the findings of the RCP validation of the project, performed on the basis of UNFCCC criteria refer to Article 12 of the Kyoto Protocol, the CDM modalities and procedures and the subsequent decisions by the CDM/GS Executive Board as well as requirement of Gold Standard.

PD has developed Landfill Waste Management Project, located at the Hamitler landfill site in Bursa province, Turkey. The landfill receives the waste of approximately 2.6 million people living Bursa province. The estimated average amount of MSW to be supplied to the landfill during the current crediting period will be 2,413 tons/day.

The project activity involves the covering of the landfill area and installation of a gas extraction system, capturing the Land Fill Gas (LFG) and feeding it to gas engines for electricity generation. Any excess of LFG (during emergency / non-operational phase of gas engine) will be flared in an enclosed flare system. The total installed capacity of the electricity generation unit under the project activity is 9.8 MW¹¹ with an estimated electricity generation of approximately 68.6 GWh/year¹². The generated electricity will be delivered to the national grid.

In the baseline situation, the LFG was released into the atmosphere without any collection, flaring or utilization.

The start date of project activity is 19/05/2012 and the start date of second crediting period is 01/08/2022 and will end on 31/07/2029.

In current condition, the project activity is operational with 07 operational gas engines of 1.4 MW each with total installed capacity of 9.8 MW. The activity generates approximately 68,600 MWh of energy and delivered to the national grid. The Project activity is estimated to reduce 261,180 tCO₂e/annum emission reductions during the second crediting period.

Assessment team checked the technical parameters of the project equipments during remote audit and confirm that the details as mentioned in the GS PDD^{/3/} submitted for second crediting period are correct.

Technology Transfer

No technology transfer from other countries is involved in the project.

The project activity is Landfill Gas Recovery and Gas Utilization Project. The recovered landfill gas extracted from the landfill will be utilized by gas engines to produce electricity, which will be delivered to the national grid.

The project activity is commissioned in phase wise manner as below^{/20/}:

- On 19/05/2012, five power generation units have commissioned as confirmed through the temporary Acceptance Protocol
- On 27/07/2012, one power generation unit has commissioned as confirmed through the temporary Acceptance Protocol

¹¹ The Generation License obtained from EMRA (Electricity Market Regulatory Authority is available to the DOE)

¹² Based on the assumption of a 7000 h operational hour when reaching full capacity of 9.8 MW.

- On 07/09/2012, one power generation unit has commissioned as confirmed through the temporary Acceptance Protocol

The geo-coordinates of the Project activity - 40°15'50.23" N, 28°58'24.36" E which are cross-checked during remote audit on the basis of approved PDD and google map software^{/21/}.

1.1 Objective

The purpose of an RCP validation is to have an independent third-party assessment of the GS4GG PDD for renewal of crediting period and compliance with the GS requirements as described in the Gold Standard documentation and supporting documents by the client. Validation is part of the GS VER project cycle and will finally result in a conclusion by Applus+ Certification whether a project activity is valid and should be submitted for registration/renewal of crediting period of a project activity rests at the GS and the parties involved.

1.2 Scope

The RCP validation scope is defined as an independent and objective review of the project PDD, the project's baseline study and monitoring plan and other relevant documents. The information in these documents is reviewed against all applicable GS requirements including the approved baseline and monitoring methodologies – ACM0001 version 19.0. The validation was based on the requirements in the Gold Standard GS4GG requirements^{/17//18//19/}.

The validation is not meant to provide any consulting towards the project developers. However, stated requests for clarifications and/or corrective actions may have provided input for improvement of the GS PDD.

2. METHODOLOGY

The project assessment is based on the CDM validation and verification standard for project activities, Version 03.0^{/16/} Gold Standard requirement for GS4GG and is conducted using standard auditing techniques^{/22/} to assess the correctness of the information provided by the project participants. Before the assessment begins, members of the team covering the technical scope(s), sectoral scope(s), and relevant host country experience for evaluating the project activity are appointed. Once the project is made available for Applus+ Certification, the members of the assessment team carried out:

1. A desk review of the PDD;
2. Follow-up interviews with project stakeholders;
3. The resolution of outstanding issues and the issuance of the final validation report and opinion.

The prepared validation report and other supporting documents then undergo an internal quality control before being submitted to the GS Registry.

The GS overview documents which is referred as DVR is as below

Validation Checklist Table 3: Resolution of Audit Findings
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Type:	☐ CAR	☐ CL/CR	☐ FAR	Number:	
Raised by:					
Description of the audit finding				Date:	
The description of the audit finding should be clearly included here.					
Project Participant's response				Date:	
The responses given by the project participants during the communications with the validation team should be included here.					
Documentation provided as evidence by Project Participant					
The evidences provided by the project participants should be included here.					
Auditor's assessment comment				Date:	
This section should include how the audit finding is assessed by the assessment team.					

The Complete List of CAR/CL/FAR is included as Appendix 1 of this report.

2.1 Appointment of the assessment team

According to the sectoral scope / technical area and experience in the sectoral or national business environment, LGAI Technological Center, S.A. (Applus+ Certification) has composed a project assessment team in accordance with the appointment rules in the internal Quality Management System of LGAI Technological Center, S.A. (Applus+ Certification).

The composition of audit team shall be approved by the LGAI Technological Center, S.A. (Applus+ Certification) ensuring that the required skills are covered by the team.

The four qualification levels for team members that are assigned by formal appointment rules are as presented below:

- Lead Auditor (LA).
- Auditor (A) / Auditor in Training (AiT)
- Technical Expert (TE).
- Technical Reviewer (TR).

The sectoral scope / technical area knowledge linked to the applied methodology/ies shall be covered by the assessment team.

Name	Role	SS Coverage	TA Coverage	Financial aspect	Host country experience
Mr. Pankaj Kumar	LA/TE	YES	YES	YES	YES

Mr. Simon Shen	TR	YES	YES	YES	NA
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The complete list of CVs is included as Appendix 2 of this report.

2.2 Document review

The Gold Standard PDD submitted by the Client was reviewed against the approved methodology and other relevant criteria to verify the correctness, credibility, and interpretation of the presented information. Furthermore, a cross-check between information provided and information from other sources has been done. A complete list of all documents and evidence material reviewed is included in Section 4 of this report.

2.3 Follow up Interviews

The site visit was scheduled for 04/04/2022 but physical on-site visit could not be conducted due to international travel restrictions from India (Location of auditors) to Turkey (Project site) and vice versa due to COVID-19 pandemic.

Therefore, physical site visit was not performed for validation of this project and exemption has been considered in compliance with GS4GG guidelines and recommendations¹³. It is worthwhile to note that PD already lost carbon credit revenue to delay in RCP validation process and postponement of validation may impact the investment plan of the PD and could lead to significant financial implications.

In order to allow a credible and sufficient means for the present validation, the VVB adopted standard auditing techniques for validation in line with GS4GG interim guidelines, as follows:

- Short video tour during remote audit
- Current pictures of plant and all the equipments
- Document review
- Interview with PD representatives (responsible for the management and monitoring of project activity), and
- Interview with stakeholders

Therefore, PD has provided all necessary information for a transparent and precise understanding of the project and has been considered sufficient by the VVB for the purpose of the present validation of RCP.

Interviewed Personnel	Functions	Organization
Ali Kantur	Chairman	ITC-KA Enerji Üretim Sanayi ve Ticaret A.Ş.
Yavuz Kantur	PP representative	ITC-KA Enerji Üretim Sanayi ve Ticaret A.Ş.
Ece Coşgun	Deputy Carbon Manager & Operations	EKI Energy Services Ltd.
Celal Boran	-	Local stakeholder
Dio Dede	-	Local stakeholder
Ata Ergun	-	Local stakeholder

The details activity done during remote audit is as below:

¹³ https://globalgoals.goldstandard.org/standards/RU_2022-v6_COVID-19_Interim-measures.pdf

Duration of Remote Audit: 04/04/2022				
No.	Activity performed during remote audit	Site location	Date	Team member
1.	Assessment team checked the implementation of the project, Baseline emission, Emission reduction calculation, technical description of the project and Monitoring. (Discussion with PP) Assessment team interviewed the local stakeholder and confirmed that there is no grievance resulted from the project activity in and out of the project location. The stakeholder confirmed that the project resulted in employment and improves lifestyles of the personal/families in the nearby villages. (Discussion with Stakeholder)	Hamitler landfill office, Bursa, Turkey (Remote audit through Skype)	04/04/2022	Mr. Pankaj Kumar

The stakeholder interaction during remote audit is described below:

Name of the stakeholder	Ata Ergun
Occupation	Villager
VVB QUESTION: Did this landfill project cause any pollution? Answer: No, the plant does not cause any pollution. VVB QUESTION: Did local villagers getting benefitted due to project activity? Answer: Yes, peoples are getting benefitted through CSR activities. Company providing various trainings to youths and also helping local schools for buildings and study material etc. VVB QUESTION: Did PP promised employment opportunity? Answer: Yes, employment is generated for local peoples. The landfill plant and electricity generation plant have provided various direct and indirect employment opportunities to the locals. VVB also like to conclude that during the interviews with PP, that local people were employed for security and operation related work. VVB also found that skilled local persons were also employed by the organization for the operation and maintenance of the power plant.	

Name of the stakeholder	Dio Dede
Occupation	Employee/Villager
VVB QUESTION: Did this landfill project cause any pollution? Answer: No, the plant does not cause any pollution. VVB QUESTION: Did local villagers getting benefitted due to project activity? Answer: Yes, peoples are getting benefitted through CSR activities. Company providing various trainings to youths etc. VVB QUESTION: Did PP promised employment opportunity?	

Answer: Yes, employment is generated for local peoples. The landfill plant and electricity generation plant have provided various direct and indirect employment opportunities to the locals.

VVB also like to conclude during the interviews with PP, that local people were employed for security and operation related work. VVB also found that skilled local persons were also employed by the organization for the operation and maintenance of the power plant.

VVB also discussed labour conditions at project site during remote audit by means of interviewing local stakeholders and confirmed that PD is in compliance with national labour code/ national labour and occupational health and safety laws and no major accidents recorded at project site. All the employees at project site also given training on Occupational health and safety issues regularly.

2.4 Resolution of Clarification and Corrective Action requests

The objective of this phase of the RCP validation was to resolve the requests for corrective actions and clarification and any other outstanding issues which needs to be clarified for Applus+ Certification positive conclusion on the PDD. The Corrective Action Requests and Clarification Requests raised by Applus+ Certification were resolved during communications between the Client and Applus+ Certification to guarantee the transparency of the validation process, the concerns raised and responses given are summarized in Appendix 1 below.

The Gold Standard GS4GG PDD version 05^{/3/} submitted on 21/10/2022 for renewal of crediting period serves as the basis for the final assessment presented. Additional changes to the GS4GG PDD during the RCP validation process are not considered to be significant with respect to the main CDM and Gold Standard objectives.

2.5 Internal Quality Control

As a final step for validation of RCP assessment, the final documentation, including the Validation of RCP Report, has to undergo an internal quality control by the Technical Reviewer(s) to be approved.

Details of the Technical Reviewer(s) are provided within the Validation of RCP Report in Section 2.1. and Appendix 2 for further references of knowledge and capability to conduct the quality checking.

After the Technical Review process, the final documentation may undergo a final quality checking process called Administrative Review, done by the Applus+ Certification's Project Manager and/or Technical Support.

For final approval, the final set of documents are prepared by the VVB's Technical Manager or its deputy and signed by the authorized signatory of the VVB.

In case, any of the persons performing this final internal quality control approval process has acted as a part of the Assessment Team or Technical Review team, the approval can only be given by VVB's authorized personnel who are not part of those teams.

If the final set of documents has been satisfactorily approved, a request of renewal of the Crediting Period (GS4GG Design Certification Renewal) is submitted to the GS Registry along with the relevant documents.

3. PROJECT DESIGN CERTIFICATION ASSESSMENT

3.1 Approval

The host country of the project activity is Turkey which is validated from the registered PDD.

The Republic of Turkey is the host country. Turkey has ratified the Kyoto Protocol (on 28/05/2009)¹⁴. Turkish National Focal Point to the UNFCCC is the Ministry of Environment and Forestry.

3.2 Participation

ITC-KA Enerji Üretim Sanayi ve Ticaret A.Ş. is the project developer from the host party Turkey. The host country involved is parties to the Kyoto Protocol and meet and requirements to participate in the Gold Standard.

3.3 Scale of the project

The project activity is identified as a Large-scale project in section A.4 of the GS4GG PDD applying a Large-scale methodology ACM0001 version 19.0^{7/}. The total capacity of the power project is 9.8 MW as validated from the registered PDD^{1/}. The project activity being a landfill gas and alternate water treatment measures belongs to Type 3: Other project activities. Since the annualized emission reduction from the project activity of 261,180 tCO₂e/annum is higher than small-scale threshold of 60,000 tCO₂e per year in any year of the crediting period therefore the project activity complies to the large-scale project activity.

Assessment team also checked the requirement of latest applicable methodology i. e. ACM0001 version 19.0 and confirms that the project qualifies the requirement of the methodology also (i.e., scale, applicability, baseline, additionality and monitoring).

a) Type of project: The project type is Waste management and handling which is an eligible project type as it is in accordance with 3.1.1 (c) of the Community Services Activity Requirements, version 1.2^{18/} which is also identified in section A.1 of GS PDD.

General Eligibility Criteria under Renewable Energy Activity Requirements:

Assessment team reviewed the general eligibility criteria under Renewable Energy Activity Requirements, version 1.4^{19/} and found that criteria appropriately provided & justified in the Section A.1.1 of the GS PDD.

3.4 Greenhouse Gases

The project activity leads to displacement of electricity generation from fossil fuel-based power plants connected to the regional grid by renewable energy generated using waste handling and disposal. The operation of the project activity will result in reduction of carbon-dioxide/methane from the atmosphere due to displacement of electricity in grid by the renewable energy through LFG flaring. Hence, the greenhouse gas identified in the PDD is carbon dioxide and methane which is duly validated by the VVB.

¹⁴ <https://unfccc.int/node/61221>

The GHG emission sources considered for the project boundary and their explanations are as follows:

Source	GHGs	Included?	Justification/Explanation
Baseline scenario	Emissions from decomposition of waste at the landfill site	CH ₄ Yes	The major source of emissions in the baseline
		N ₂ O No	N ₂ O emissions are small compared to CH ₄ emissions from landfills. Exclusion of this gas is conservative.
		CO ₂ No	CO ₂ emissions from the decomposition of organic waste are not accounted.
	Emissions from electricity consumption	CO ₂ Yes	Main emission source
		CH ₄ No	Minor emission source
		N ₂ O No	Minor emission source
Project scenario	Emissions from on-site electricity use	CO ₂ Yes	This is an important source of emissions in the project activity
		CH ₄ No	Excluded for simplification. This emission source is assumed to be very small
		N ₂ O No	Excluded for simplification. This emission source is assumed to be very small

3.5 Project timeframe

Other certification scheme: The project activity has not applied, confirmed by project developer, for any other certification like Green or White certification. Therefore, the validation team concluded that the project activity meets the applicability criteria of Gold Standard. Assessment team checked the double counting clarification vide GS guideline on double counting in the context of Green Certificate Schemes, 22/01/2015. A declaration submitted by PD confirms that the project activity is not claiming GHG reductions in any other mechanism. The project is applied for GS VER regular validation. Further, project activity is also not availing any International REC benefits.

3.6 Public announcement

Assessment team is in opinion, taking note of the validation report and PDD that the incentive in the form of carbon credits was seriously considered in the decision to proceed with the project activity. The project is registered under GS mechanism¹⁵.

3.7 Project Boundary

As per ACM0001, version 19.0 para 16 (a) the project boundary of the project activity shall include the site where the LFG is captured and sites where the LFG is flared or used (e. g. flare, power plant, boiler, air heater, glass melting furnace, kiln, natural gas distribution network, dedicated pipeline or biogas processing facility).

¹⁵ <https://registry.goldstandard.org/projects/details/53>

PD has clearly defined and identified the project boundary correctly which is checked and accepted by VVB.

Further, the geographic and system boundaries for the relevant electricity grid can be clearly identified and information on the characteristics of the grid is available as required by the "Tool to calculate the emission factor for an electricity system" (version 07.0). The electricity produced on-site will be delivered to the Turkish national grid.

3.8 Baseline Identification

This is 1st renewal of crediting period and PD has established baseline as per the registered GS PDD version 12 dated 08/12/2013^{1/} which is validated by VVB through her validation report^{2/}.

PD has discussed baseline scenario identification in the current GS PDD also which was checked against applicable methodology and applicable tools and found correct and hence accepted.

As this is renewal of crediting period, VVB need to access PD's demonstration of the validity of baseline in line with Tool for "Assessment of the validity of the original/current baseline and update of the baseline at the renewal of the crediting period" Version 03.0.1^{14/}

The evaluation of the original baseline is performed in 4 steps, namely:

- Assessment of compliance of the baseline with relevant mandatory national and/or sectoral policies – PD has clearly demonstrated in section B.4 that the original baseline complies with all relevant national and sectoral policies. PP has referred the following policies which were cross checked to confirm that the current baseline complies with all relevant mandatory national and/or sectoral policies which have come into effect after the submission of the project activity for validation or the submission of the previous request for renewal of the crediting period and are applicable at the time of requesting renewal of the crediting period:
 - Electricity Market Law¹⁶
 - Law on Utilization of Renewable Energy Resources for the Purpose of Generating Electricity Energy¹⁷
 - Environmental Law¹⁸
 - Regulation on Solid Waste Control¹⁹
 - Regulation on Managed Waste Landfilling²⁰
- Assessment on impact of circumstances – the evaluation is based on 3 relevant aspects, i.e., legislation and policy environment, electricity sales prices, and similar project activities, revealing that the conditions used to determine the baseline emissions in the 1st crediting period are still valid at the time of requesting the renewal of the current crediting period. VVB has assessed the impact of circumstances and it is noted that baseline emission factor needs to be re-calculated which is calculated as per "Tool to calculate the emission factor of an electricity system" version 07.0^{11/} and no other impact of circumstances is applicable.

¹⁶ [Law Number: 4628 Ratification Date: 20/02/2001 Enactment Date: 03/03/2001] Reference: The official web page of EMRA; http://www.epdk.org.tr/mevzuat/kanun/elektrik/elektrik_piyasalari_kanunu.pdf

¹⁷ [Law Number: 5346 Ratification Date: 10/05/2005 Enactment Date: 18/05/2005] Reference: The official web page of EMRA; <http://www.epdk.org.tr/mevzuat/diger/yenilenebilir/yenilenebilir.doc>

¹⁸ [Law Number: 2827 Ratification Date: 09/08/1983 Enactment Date: 11/08/1983] Reference: The official web page of the Ministry of Environment and Forestry; www.cevreorman.gov.tr/yasa/k/2827.doc

¹⁹ [Last updated on 05/04/2005] Reference: The official web page of the Ministry of Environment and Forestry; <http://www.cygm.gov.tr/CYGM/Files/mevzuat/yonetmelik/kaky.doc>

²⁰ [Regulation number 27533 Enactment Date: 26/03/2010] Reference: The official web page of the Ministry of Environment and Forestry; http://www.cygm.gov.tr/CYGM/Files/mevzuat/yonetmelik/Duzenli_Depolama.doc

- Assessment whether the continuation of use of current baseline equipment(s) or an investment is the most likely scenario for the crediting period for which renewal is requested – the step has been correctly noted as not relevant for the project activity as the technical life time of the equipment that would have continued to be used in the absence of the project activity exceeds the crediting period for which renewal is requested.
- Assessment of the validity of the data and parameters – PD has evaluated validity of the implemented data and parameters and concluded that the Global Warming Potential for CH₄ as well as the ex-ante determined combined margin emission factor for the 1st crediting period shall be updated for the requested renewal period.

Therefore, it has been concluded that there is no need to update the original baseline scenario and is valid for the 2nd crediting period, though data and parameters shall be updated.

3.9 Eligibility Principles Assessment

- **Principle 1. Contribution to Climate Security & Sustainable Development**

The Republic of Turkey is the host country. Turkey has ratified the Kyoto Protocol (on 28/05/2009). Turkish National Focal Point to the UNFCCC is the Ministry of Environment and Forestry. Thus the project's contribution towards sustainable development has been addressed based on the following sustainable development aspects:

I. Social well-being:

Implementation of this project enhance local employment during the construction and operation of landfill gas capture and its utilization. As a result, increased job opportunities and project trade activities partially eliminated local poverty and unemployment. As a contribution of the Project to the region's welfare, the quality of the electricity consumed in the region is increased by local electricity production, which also contributes to decreasing distribution losses.

II. Economic well-being:

Implementation of the project will accelerate the growth of the LFG capture and its utilization projects. Other entrepreneurs, irrespective of the sector, are encouraged to invest in this sector. It also assists in reducing Turkey's increasing energy deficit and diversify the electricity generation mix while reducing import dependency. Importantly, rural development is maintained in the areas around the project site by providing infrastructural investments to these remote areas.

III. Environmental well-being:

The project activity replaces the grid electricity, which comprises different fuel sources causing greenhouse gas emissions. By substituting in the consumption of these fuels, it contributes to the conservation of water, soil, flora, and fauna. It transfers these natural resources and the additional supply of these primary energy sources to future generations. In the absence of the project activity, an equivalent amount of electricity would have been generated from the power plants connected to the grid, most of which are based on fossil fuels. Thus, the Project is replacing the greenhouse gas emissions (CO₂, CH₄) and other pollutants (SO_x, NO_x, particulate matters) from extraction, processing, transportation, and burning of fossil fuels for power generation connected to the national grid.

IV. Technological well-being:

Implementation of the project contributes to the broader deployment of the technology at a local and national level. It demonstrates the viability of the technology that supports improved energy security, alternative sustainable energy, and renewable energy industry development. This will also strengthen the pillars of the Turkish electricity supply based on ecologically sound technology.

Principle 2: Safeguarding Principles

The Safeguarding principles assessment is as below:

Safeguarding principles	Assessment questions	Assessment of relevance to the project (Yes / potentially / no)	Justification of the Assessment team	Mitigation measure (if required)
Principle 1: Human Rights	1. The Project Developer and the Project shall respect internationally proclaimed human rights and shall not be complicit in violence or human rights abuses of any kind as defined in the Universal Declaration of Human Rights. 2. The Project shall not discriminate with regards to participation and inclusion.	No	The project respects internationally proclaimed human rights including dignity, cultural property. Turkey is a party to Universal Declaration of Human Rights: http://ua.mfa.gov.tr/detay.aspx?2634	Not applicable
Principle 2: Gender Equality	1. The Project shall not directly or indirectly lead to/contribute to adverse impacts on gender equality and/or the situation of women 2. Projects shall apply the principles of non-discrimination, equal treatment, and equal pay for equal work 3. The Project shall refer to the	No	The project does not involve in any form discrimination in any kind of form. Turkey is also party to Convention on Discrimination since 1967 to prevent any form of discrimination; http://ua.mfa.gov.tr/files.a.shx?872	Not applicable

Safeguarding principles	Assessment questions	Assessment of relevance to the project (Yes / potentially / no)	Justification of the Assessment team	Mitigation measure (if required)
	country's national gender strategy or equivalent national commitment to aid in assessing gender risks 4. (where required) Summary of opinions and recommendations of an Expert Stakeholder(s)			
Principle 3 – Community Health, Safety and Working Conditions	1. The Project shall avoid community exposure to increased health risks and shall not adversely affect the health of the workers and the community.	Yes	The project leads to safe working condition and improvement in health as it will replace coal as fuel with LFG which is clean and safe. Further, periodic trainings are being implemented for all employees to ensure prevention of any unsafe working condition. Turkey has ratified ILO convention 155 and about work safety and precautions. VVB confirmed through the below web link and also during interview with PP representatives and stakeholders https://www.ilo.org/global/standards/subjects-covered-by-international-labour-standards/occupational-safety-and-health/WCMS_356966/lang--en/index.htm	Training programmes will be arranged for better safety understanding.
Principle 4 – Sites of Cultural and Historical Heritage,	Does the Project Area include sites, structures, or objects with historical, cultural, artistic, traditional or religious	No	NA	NA

Safeguarding principles	Assessment questions	Assessment of relevance to the project (Yes / potentially / no)	Justification of the Assessment team	Mitigation measure (if required)
	values or intangible forms of culture (e.g., knowledge, innovations, or practices)?			
Principle 4.2: Forced Eviction and Displacement	Does the Project require or cause the physical or economic relocation of peoples (temporary or permanent, full or partial)?	No	NA	NA
Principle 4.3: Land Tenure and Other Rights	Does the Project require any change, or have any uncertainties related to land tenure arrangements and/or access rights, usage rights or land ownership?	No	NA	NA
Principle 5 – Corruption	The Project shall not involve, be complicit in or inadvertently contribute to or reinforce corruption or corrupt Projects	No	The project does not involve any kind of corruption. Turkey is a party to United Nation Convention against Corruption since 2006; http://ua.mfa.gov.tr/detay.aspx?15042	The Project owner has not any negative track record related to corruption or any such activity.
Principle 6.1 – Labour Rights	1. The Project Developer shall ensure that there is no forced labour and that all employment is in compliance with national labour and occupational health and safety laws, with the principles and standards embodied in the International	No	Project owner protects labours rights of all employees within this company. Workers might have occupational accidents during construction and operation phase. According to project developer, during construction and operational phase of the project "Health and	Necessary health and safety measures will be taken during operation phase according to the regulation of health

Safeguarding principles	Assessment questions	Assessment of relevance to the project (Yes / potentially / no)	Justification of the Assessment team	Mitigation measure (if required)
	Labour Organization (ILO) fundamental conventions. 2. Workers shall be able to establish and join labour organisations. 3. Working agreements with all individual workers shall be documented and implemented. These shall at minimum comprise: (a) Working hours (must not exceed 48 hours per week on a regular basis), AND (b) Duties and tasks, AND (c) Remuneration (must include provision for payment of overtime), AND (d) Modalities on health insurance, AND (e) Modalities on termination of the contract with provision for voluntary resignation by employee, AND (f) Provision for annual leave of not less than 10 days per year, not		Occupational Safety Regulation" will be followed. Regulation could be found under this link too: http://www.mevzuat.gov.tr/MevzuatMetin/1.5.6331.pdf	and safety requirements in construction Works (http://www.resmigazete.gov.tr/eskiler/2013/10/20131005-2.htm)., Additionally, relevant staff will be trained to be able to work with high voltages, high heights and heavy machineries ..

Safeguarding principles	Assessment questions	Assessment of relevance to the project (Yes / potentially / no)	Justification of the Assessment team	Mitigation measure (if required)
	including sick and casual leave. 4. No child labour is allowed (Exceptions for children working on their families' property requires an Expert Stakeholder opinion) 5. The Project Developer shall ensure the use of appropriate equipment, training of workers, documentation and reporting of accidents and incidents, and emergency preparedness and response measures.			
Principle 6.2 Negative Economic Consequences	1. Does the project cause negative economic consequences during and after project implementation?	No	The project does not involve any negative impacts and no any potential risk to local economy. The project leads to economic development of the local area by means of generating employment opportunities for local people either directly or indirectly.	Not applicable
Principle 7.1 : Emissions	Will the Project increase greenhouse gas emissions over the Baseline Scenario?	No	On the contrary, it helps to reduce GHG emissions by producing green energy.	Not applicable
Principle 7.2 : Energy Supply	Will the Project use energy from a local grid or power supply (i.e., not connected to a national or regional grid) or fuel resource	No	Plant sometimes can use energy from local grid. However, this amount is really less when it is compared with its	Not applicable

Safeguarding principles	Assessment questions	Assessment of relevance to the project (Yes / potentially / no)	Justification of the Assessment team	Mitigation measure (if required)
	(such as wood, biomass) that provides for other local users?		production of green energy amount.	
Principle 8.1: Impact on natural water patterns and flow	Will the Project affect the natural or pre-existing pattern of watercourses, ground-water and/or the watershed(s) such as high seasonal flow variability, flooding potential, lack of aquatic connectivity or water scarcity?	No	VVB confirmed through remote interviews with stakeholders that are no protected aquifers close to the plant. No lakes, streams are located in the vicinity of the plant either.	Not applicable
Principle 8.2: Erosion and/or water body stability	1. Could the Project directly or indirectly cause additional erosion and/or water body instability or disrupt the natural pattern of erosion? If 'Yes' or 'Potentially' proceed to question 2. 2. Is the Project's area of influence susceptible to excessive erosion and/or water body instability?	No	The project is being implemented in a proper way (by considering the concerns indicated via the entire principle 4.2.2 Erosion and/or Water Body Instability): There is no interruption to the hydrological systems in a WPP	Not applicable
Principle 9.1: Landscape modification and soil	Does the Project involve the use of land and soil for production of crops or other products?	No	The project is being implemented in a proper way (by considering the concerns indicated via the entire principal Landscape Modification and Soil): Only potential impact to soil would be observed due to construction activities of the project, and these negligible impacts are not permanent. Furthermore,	Not applicable

Safeguarding principles	Assessment questions	Assessment of relevance to the project (Yes / potentially / no)	Justification of the Assessment team	Mitigation measure (if required)
			there is an access road to the project area so that there is no problem in accessing the area. The necessary attention to be paid to the speed limits of the trucks and the material inside the trucks will be covered. Trucks to be loaded in line with the axle load and will not be overloaded, the top 10% of the material to be moisturised.	
Principle 9.2: Vulnerability to Natural Disaster	Will the Project be susceptible to or lead to increased vulnerability, earthquakes, subsidence, landslides, erosion, flooding, drought or other extreme climatic conditions?	No	The project is being implemented in a proper way (by considering the concerns indicated via the entire principal Vulnerability to Natural Disaster): The project area is not a place to specific extreme climatic conditions and harmful natural events such as earthquake.	Not Applicable
Principle 9.3: Genetic Resources	Could the Project be negatively impacted by the use of genetically modified organisms or GMOs (e.g., contamination, collection and/or harvesting, commercial development, or take place in facilities or farms that include GMOs in their processes and production)?	No	The project is renewable energy technology (LFG utilization technology). The Project not be negatively impacted by the use of genetically modified organisms or GMOs. Thus this section is Not Applicable	Not Applicable

Safeguarding principles	Assessment questions	Assessment of relevance to the project (Yes / potentially / no)	Justification of the Assessment team	Mitigation measure (if required)
Principle 9.4: Release of pollutants	Could the Project potentially result in the release of pollutants to the environment?	No	During remote audit, PP representative confirmed that during the crediting period, the Project Activity will produce domestic waste due to employee but it will be collected appropriately. Also, waste oil will be generated due to operation of turbines and they will also be collected and disposed following related regulations and precautions defined by the laws and the Municipality. Moreover, wastewater generated by the employee use will be collected and disposed appropriately following relevant regulations.	Wastewater will be vacuumed by vacuum truck regularly. By this way, discharge of plant sourced wastewater will not be allowed. Waste oil will be vacuumed by vacuum truck regularly. By this way, discharge of plant sourced waste oil will not be allowed. Garbage bins' photos will be provided for solid household waste. By this way, solid waste disposal will not be allowed.
Principle 9.5: Hazardous and	Will the Project involve the manufacture, trade, release, and/ or	No	The project activity is a renewable energy project and doesn't involve any hazardous chemicals &	All relevant legal building

Safeguarding principles	Assessment questions	Assessment of relevance to the project (Yes / potentially / no)	Justification of the Assessment team	Mitigation measure (if required)
Non-hazardous Waste	use of hazardous and non-hazardous chemicals and/or materials?		other materials. the host party has its credible legislation "Health and Occupational Safety Regulation". Regulation could be found under this link too: http://www.resmigazete.gov.tr/eskiler/2012/06/20120630-1.htm	codes will be applied appropriately.
Principle 9.6: Pesticides and fertilizers	Will the Project involve the application of pesticides and/or fertilisers?	No	NA	Not Applicable
Principle 9.7: Harvesting of forests	Will the Project involve the harvesting of forests?	No	The project is renewable energy technology (LFG capture and utilization) power generation. The project activity does not involve any harvesting of forests. Thus this principle is Not Applicable.	Not Applicable
Principle 9.8: Food	Does the Project modify the quantity or nutritional quality of food available such as through crop regime alteration or export or economic incentives?	No	The project is renewable energy technology (LFG capture and utilization) power generation. The Project does not modify the quantity or nutritional quality of food available. Thus this principle is Not Applicable	Not Applicable
Principle 9.9: Animal Husbandry	Will the Project involve animal husbandry?	No	The project is being implemented in a proper way (by considering the concerns indicated via the entire principle 4.3.9 Animal husbandry): The project does not involve any operation that disrupt husbandry and agriculture in the region.	Not Applicable

Safeguarding principles	Assessment questions	Assessment of relevance to the project (Yes / potentially / no)	Justification of the Assessment team	Mitigation measure (if required)
Principle 9.10: High Conservation Value Areas and Critical Habitats	Does the Project physically affect or alter largely intact or High Conservation Value (HCV) ecosystems, critical habitats, landscapes, key biodiversity areas or sites identified?	No	NA	Not Applicable
Principle 9.11: Endangered Species	1. Are there any endangered species identified as potentially being present within the Project boundary (including those that may route through the area)? AND/OR 2. Does the Project potentially impact other areas where endangered species may be present through trans boundary affects?	No	NA	Not Applicable

The safeguarding principles relevant to the project activity are justified by PD based on supporting web links, references wherever applicable.

These safeguarding principles assessment is validated through reference weblinks and documentary evidence provided by PD during the remote audit.

The SDG goals are also described below:

SDG Indicator	Assessment of Methodological choices/approaches for estimating the SDG outcome
SDG 7 – Affordable and Clean Energy: Ensure access to affordable,	Measurement Method: Electricity produced and supplied to the grid is monitored through energy meter. Monthly protocols will be signed by

SDG Indicator	Assessment of Methodological choices/approaches for estimating the SDG outcome
reliable, sustainable and modern energy for all. (7.2 'By 2030, increase substantially the share of renewable energy in the global energy mix.'")	project participants and grid operator and stored. The amount of electricity produced by each type of gas will be monitored directly at the engines. QA/QC Process: This parameter is monitored monthly, and value of parameter is cross checked with invoices. The meters are calibrated on regular frequency. Relevant SDG Target: 7.2 -By 2030, increase substantially the share of renewable energy in the global energy mix. Corresponding indicator: Electricity produced and supplied to the grid. (7.2.1 Renewable energy share in the total final energy consumption)
SDG 8 – Decent Work and Economic Growth: Promote inclusive and sustainable economic growth, full and productive employment and decent work for all (8.5 By 2030, achieve full and productive employment and decent work for all women and men, including for young people and persons with disabilities, and equal pay for work of equal value")	Measurement Method: - Training and employment generation is monitored through training records; staff register or letter from O&M contractor for training and employment details or HSE/HR records. QA/QC Process: This parameter is based on records, data and no QA/QC procedure required. The VVB confirmed this parameter during remote interviews with employees for training and employment generation. Relevant SDG Target: 8.8.2 – Quantitative employment and income generation Corresponding indicator: 2. Employment generated due to project activity (05 persons)
SDG 13 – Climate Action: Take urgent action to combat climate change and its impacts. (13.3. Improve education, awareness-raising and human and institutional capacity on climate change mitigation, adaptation, impact reduction and early warning.)	Measurement Method: - The emission reduction parameter is calculated as product of net electricity supplied to grid and grid emission factor calculated as considering the EPIAS records for the net electricity generated and the emission factor for the grid, 0.4929 tCO₂/MWh, which is calculated and published by The Ministry of Energy and Natural Resources of Turkey²¹ This is in line with "Tool to calculate the emission factor for an electricity system, version 07.0"^{11/}. The emission reductions are calculated as per registered PDD and as per methodology requirement. QA/QC Process: This parameter is calculated, and no any QA/QC procedure required. Relevant SDG Target: 13.3.1: Integrate climate change measures into national policies, strategies and planning

²¹ https://enerjiapi.etkb.gov.tr/Media/Dizin/ETKB/Duyurular//0c6b62ea-bf2f-4fea-b9b3-28bc6f48ddf2_Bilgi_Formu_-_Web_Sitesi.pdf

SDG Indicator	Assessment of Methodological choices/approaches for estimating the SDG outcome
	Corresponding indicator: Emission reductions in tCO _{2e} from the project activity

- **Principle 3: Stakeholder Inclusivity**

The project is applying for the renewal of the crediting period i. e. 2nd crediting period from 01/08/2022 to 31/07/2029. Thus, reassessment of stakeholder's inclusivity not required.

- **Principle 4: Demonstration of real outcomes**

The Sustainable monitoring plan is described below:

SDG Parameter/ Safeguarding principle	Indicator	Monitoring
SDG 7: Affordable and Clean Energy	Net Electricity Quantity to Turkish national grid delivered by the project (MWh)	Energy meter installed by Turkish grid company measure the electricity transferred to TEİAŞ substation. These meters are sealed by TEİAŞ and intervention by project proponent is not possible. Measured hourly and readings monthly.
SDG 8: Decent Work and Economic Growth	1. Employment generated due to project activity.	Project Developer has documentation pertaining to employment. Assessment team checked employment records and confirms that due to project activity peoples are getting more than minimum wages as a salary and this salary is better than local level salary. Based on the roles and responsibility of employee, the salary will be higher than the minimum salary of the region and hence the parameter monitoring is acceptable to the assessment team. Assessment team checked that 05 people are employed at site per year and at least 01 training will be conducted for the team during remote audit & employment records. The employment opportunities generated are local or temporary or permanent as checked and confirmed by the assessment team. It will be ensured that safe working condition and safety equipment's has been provided for all skilled and unskilled Labor. It will be checked during verification through audit observations and interview with people if noise level is maintained within permissible limit. Safety equipment to be provided to workers both skilled and unskilled will be checked during the

SDG Parameter/ Safeguarding principle	Indicator	Monitoring
		verification of the project activity. Assessment team however checked the same is already provided to the workers as part of companies CSR (EHS) policy.
SDG 13: Climate Action	Emission Reductions	The emission reduction calculation will be done as per the formula mentioned in the PDD. As the parameter is subjected to monitoring the same will be checked during the verification of the project activity.

Principle 5: Financial Additionality & Ongoing Financial Need

The additionality of the project activity has been demonstrated in-line with “Combined tool to identify the baseline scenario and demonstrate additionality”, version 07.0.0^{/8/}. All steps of the additionality tool have been demonstrated in the PDD^{/1/} and validation report^{/2/}.

The project activity is already registered with the GS and additionality of project already demonstrated in registered PDD (<https://registry.goldstandard.org/projects/details/53>), found the same to be correct and appropriate.

3.10 Calculation algorithm and/or formula used to determine emission reductions

The GS4GG PDD of the project activity is checked by the assessment team and found that approved methodology ACM0001, version 19.0 is used for the renewal of crediting period validation which is in line with the GS for Global Goals “Principles and Requirements” Version 1.2 which recommends the application of the latest version of the applied methodology along with the conservative argument of the approach followed. VVB confirms that the project activity is in line with the latest versions of the methodologies.

The formula used in the GS PDD was used for the calculation of emission reductions and same is found to be correct. Hence emission reduction calculation at this time of validation is conservative and appropriate.

Assessment team checked net emission reductions for the project activity are calculated in line with the applied methodologies.

LFG Capture and its Utilization for Power Generation as per ACM0001 version 19.0

Baseline Emissions

The baseline emissions are:

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

PD has determined baseline emissions according to equation (1) of ACM0001 version 19.0 as following:

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

Where:

BE_y	Baseline emissions in year y (tCO ₂ e/yr)
$BE_{CH_4,y}$	Baseline emissions of methane from the SWDS in year y (tCO ₂ e/yr)
$BE_{EC,y}$	Baseline emissions associated with electricity generation in year y (tCO ₂ e/yr)
$BE_{HG,y}$	Baseline emissions associated with heat generation in year y (tCO ₂ e/yr)
$BE_{NG,y}$	Baseline emissions associated with natural gas use in year y (tCO ₂ e/yr)

Since the project activity does not include generation of heat/thermal energy and use of natural gas. Therefore:

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

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

For estimation of baseline emissions of methane from SWDS, equation 2 of ACM0001 version 19.0 is used;

$$BE_{CH_4} = ((1 - OX_{top_layer}) \times F_{CH_4,PJ,y} - F_{CH_4,BL,y}) \times GWP_{CH_4}$$

Where:

$BE_{CH_4,y}$	Baseline emissions of methane from the SWDS in year y (t CO ₂ e/yr)
OX_{top_layer}	Fraction of methane in the LFG that would be oxidized in the top layer of the SWDS in the baseline (dimensionless)
$F_{CH_4,PJ,y}$	Amount of methane in the LFG which is flared and/or used in the project activity in year y (t CH ₄ /yr)
$F_{CH_4,BL,y}$	Amount of methane in the LFG that would be flared in the baseline in year y (tCH ₄ /yr)
GWP_{CH_4}	Global warming potential of CH ₄ (tCO ₂ e/tCH ₄)

During the crediting period $F_{CH_4,PJ,y}$ is determined as the sum of quantities of methane flared and used in power plant(s) as follows:

$$F_{CH_4,PJ,y} = F_{CH_4,flared,y} + F_{CH_4,EL,y} + F_{CH_4,HG,y} + F_{CH_4,NG,y} \quad \text{Equation 3 in ACM0001 V19}$$

Where:

$F_{CH_4,PJ,y}$	Amount of methane in the LFG which is flared and/or used in the project activity in year y (tCH ₄ /yr)
$F_{CH_4,flared,y}$	Amount of methane in the LFG which is destroyed by flaring in year y (tCH ₄ /yr)
$F_{CH_4,EL,y}$	Amount of methane in the LFG which is used for electricity generation in year y (tCH ₄ /yr)

$F_{CH_4,HG,y}$ Amount of methane in the LFG which is used for heat generation in year y (t CH₄/yr)

$F_{CH_4,NG,y}$ Amount of methane in the LFG which is sent to the natural gas distribution network and/or dedicated pipeline and/or to the trucks in year y (t CH₄/yr)

Since there are no heat generations or natural gas usage therefore *Ex-post determination of $F_{CH_4,PJ,y}$* will be limited to methane emissions from SWDS (A) and electricity generation (B) will be taken into account,

$$F_{CH_4,PJ,y} = F_{CH_4,flared,y} + F_{CH_4,EL,y}$$

$F_{CH_4,EL,y}$ is determined using the "Tool to determine the mass flow of a greenhouse gas" in a gaseous stream" and monitoring the working hours of the power plant, so that no emission reduction are claimed for methane destruction during non-working hours. This is taken into account by monitoring the hours that the equipment utilizing the LFG is operating in year y ($Op_{j,h,y}$).

$F_{CH_4,PJ,y}$ is determined using the "Tool to determine the mass flow of a greenhouse gas in a gaseous stream" version 03.0.0^{12/}

The tool provides procedures to determine the following parameter:

Parameter	SI Unit	Description
$F_{i,t}$	kg/h	Mass flow of greenhouse gas i (CO ₂ , CH ₄ , N ₂ O, SF ₆ or a PFC) in the gaseous stream in time interval t.

The mass flow of CH₄ in LFG is determined through measurement of the flow and volumetric fraction of the gaseous stream (LFG). The "Tool to determine the mass flow of a greenhouse gas in a gaseous stream" version 03.0.0 provides 6 different ways to make these measurements and the corresponding calculation option for $F_{i,t}$.

Option A is applied in the proposed project activity. Since option B and E has not been selected as an option, the absolute humidity of the gaseous stream will not be determined.

Option A:

According to the "Tool to determine the mass flow of a greenhouse gas in a gaseous stream" version 03.0.0, flow measurement on a dry measurement is not doable for a wet gaseous stream. Therefore, it will be demonstrated that the temperature of the gaseous stream (T_t) is less than 60°C (333.15 K) at the flow measurement point.

The mass flow of CH₄ ($F_{CH_4,t}$) is determined as follows:

$$F_{CH_4,t} = V_{t,db} * v_{CH_4,t,db} * \rho_{CH_4,t} \quad \text{Equation 5 in TOOL08}$$

With

$$\rho_{CH_4,t} = P_t * MM_{CH_4} / R_u * T_t \quad \text{Equation 6 in TOOL08}$$

Where:

$F_{CH_4,t}$	Mass flow of CH ₄ 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 dry basis (m ³ dry gas/h)
$V_{CH_4,t,db}$	Volumetric fraction of CH ₄ in the gaseous stream in a time interval t on a dry basis (m ³ gas CH ₄ /m ³ dry gas)
$\rho_{CH_4,t}$	Density of CH ₄ in the gaseous stream in time interval t (kg gas CH ₄ / m ³ gas CH ₄)
P_t	Absolute pressure of the gaseous stream in time interval t (Pa)
MM_{CH_4}	Molecular Mass of CH ₄ (kg/kmol)
R_u	Universal ideal gases content (Pa.m ³ /kmol.K)
T_t	Temperature of gaseous stream in time interval t (K)

The amount of methane destroyed by flaring ($F_{CH_4, flared,y}$)

The project participant opts to exclude the flare system from the baseline calculations and will not claim any emission reductions from the flaring activities (if any) within the crediting period, since the flare system is observed/envisaged to work none or for insignificant durations throughout the operational lifetime.

The exclusion of the emission reductions from flaring activities is conservative since it will result in no change (if there is no flaring activity) or decrease in the total emission reductions (if flaring activity is observed).

In accordance to the above explanation, the "Project emissions from flaring" Version 03, is not applied to the proposed project activity and no emission reductions will be claimed from the flaring activity, therefore the amount of methane destroyed by flaring $F_{CH_4, flared,y}$ is fixed to "0".

Step A.1.1: Ex-ante estimation of $F_{CH_4,PJ,y}$

An ex-ante estimate of $F_{CH_4,PJ,y}$ is required to estimate baseline emissions of methane from the SWDS (according to equation 3) in order to estimate the emission reductions of the project activity. In accordance with applied methodology, it is determined as follows:

$$F_{CH_4,PJ,y} = \eta_{PJ} \cdot BE_{CH_4,SWDS,y} / GWP_{CH_4} \quad \text{Equation 5}$$

Where:

$F_{CH_4,PJ,y}$	Amount of methane in the LFG which is flared and or used in the project activity in year y (tCH ₄ /yr)
$BE_{CH_4,SWDS,y}$	Amount of methane in the LFG that is generated from the SWDS in the baseline scenario in year y (tCO ₂ e/yr)
η_{PJ}	Efficiency of the LFG capture system that will be installed in the project activity
GWP_{CH_4}	Global Warming Potential of CH ₄ (tCO ₂ e/tCH ₄)

$BE_{CH_4,SWDS,y}$ is determined using the methodological tool "Emissions from solid disposal sites" version 08.0^{9/}. The amount of methane generated from disposal of waste at the SWDS is calculated based on a first order decay (FOD) model. The amount of methane generated from disposal of waste at the SWDS is calculated for year y as follows:

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

Equation 1 in “Emissions from solid disposal sites” version 08.0

Where:

$BE_{CH_4,SWDS,y}$	Methane emissions avoided during the year y from preventing waste disposal at the solid waste disposal site (SWDS) during the period from the start of the project activity to the end of the year y (tCO ₂ e)
ϕ	Model correction factor to account for model uncertainties (0.9)
f	Fraction of methane captured at the SWDS and flared, combusted or used in another manner
GWP_{CH_4}	Global Warming Potential of methane valid for the commitment period (tCO ₂ e/tCH ₄)
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) (0.5)
DOC_f	Fraction of degradable organic carbon (DOC) that can decompose
MCF	Methane correction factor
$W_{j,x}$	Amount of organic waste type j prevented from disposal in the SWDS in the year x (tonnes)
DOC_j	Fraction of degradable organic carbon (by weight) in the waste type j
k_j	Decay rate for the waste type j
j	Waste type category (index)
x	Year during the crediting period: x runs from the first year of the first crediting period (x=1) to the year y for which avoided emissions are calculated (x=y)
y	Year for which methane emissions are calculated

Parameters required applying the FOD model

The parameters required to apply the FOD model is listed under table below. The parameters are selected according to Application A as defined under the tool “Emissions from solid disposal sites” Version 08.0^{9/}, and under section B.2 “Applicability of the tool” in the PDD^{1/}.

Parameter	Value		
Φ_y	A default value of 0.75		
OX	A default value of 0.1		
F	A default value of 0.5		
$DOC_{f,y}$	A default value of 0.5		
MCF_y	A default value of 0.8		
k_j	The following values for the different waste types have been applied as a default value:		
	Waste type j		Boreal and Temperate (MAT < 20°C)
			WET (MAP/PET > 1)
	Slowly degrading	Pulp, paper, cardboard	0.06
		Wood, wood products and straw	0.03
	Moderately degrading	Other (non-food) organic putrescible garden and park waste	0.10

	Rapidly degrading	Food, food waste, sewage sludge, beverages and tobacco	0.185
$W_{j,x}$	Estimated once. Please refer to table 14		
DOC_j	The following values for the different waste types have been applied as a default value:		
	Waste type j	DOC_j (% wet waste)	
	Wood and wood products	43	
	Pulp, paper and cardboard	40	
	Food, food waste, beverages and tobacco	15	
	Textiles	24	
	Garden, yard and park waste	20	
	Glass, plastic, metal, other inert	0	
f_y	A default value of 0		

Determining the model correction factor (Φ_y)

In line with the requirements of the tool "Emissions from solid disposal sites" version 08.0, a default value: $\Phi_y = \Phi_{default}$ is used. $\Phi_{default}$ is set as 0.75.

Determining the amounts of waste types j disposed in the SWDS ($W_{j,x}$)

In total approximately 15.98 million tons of MSW is estimated to be accumulated between 1996 and 2021. The latest figure on the total amount of daily waste is 2,276 ton/day in year 2021 and it is increased by the population growing rate by 1.3% each upcoming year for ex-ante purposes. PD expects waste input throughout the crediting period.

Determining the fraction of DOC that decomposes in the SWDS ($DOC_{f,y}$)

In line with the requirements of the tool "Emissions from solid disposal sites" version 08.0, a default value: $DOC_{f,y} = DOC_{f,default}$ will be used. $DOC_{f,default}$ is set as 0.5.

Procedure to determine the methane correction factor (MCF_y)

In line with the requirements of the tool "Emissions from solid disposal sites" version 08.0, a default value: $MCF_y = MCF_{default}$ will be used. $DOC_{f,default}$ is set as 0.8, which corresponds to unmanaged solid waste disposal site – deep.

Step A.2: Determination of $F_{CH_4, BL, y}$

This step provides a procedure to determine the amount of methane that would have been captured and destroyed (by flaring) in the baseline due to regulatory requirements, or to address safety and odour concerns. The applied methodology provides 4 cases and corresponding instructions.

Situation at the start of the project activity:	Requirement to destroy methane	Existing LFG capture and destruction system
Case 1: No requirement to destroy methane exists and no existing LFG capture system	No	No
Case 2: Requirement to destroy methane exists and no existing LFG capture system	Yes	No
Case 3: No requirement to destroy methane exists and an LFG capture system exists	No	Yes
Case 4: Requirement to destroy methane exists and LFG capture system exists	Yes	Yes

The situation at the start of the project activity falls under Case 1 since there are no legal requirements in Turkey to destroy methane and the LFG was not captured prior to the project activity operation.

Therefore:

$$F_{CH_4, BL, y} = 0$$

Step B: Baseline emissions associated with electricity generation ($BE_{EC, y}$)

The baseline emissions associated with electricity generation in year y ($BE_{EC, y}$) is calculated in accordance with the "Baseline, project and/or leakage emissions from electricity consumption and monitoring of electricity generation " Version 3.0^{10/}. The electricity source k in the tool corresponds to the sources of electricity generated by the grid, which is identified as the most plausible baseline scenario. $EC_{BL, k, y}$ in the tool is equivalent to the net amount of electricity generated using LFG in year y ($EG_{PJ, y}$).

Generic approach

In the generic approach, baseline emissions from consumption of electricity are calculated based on the quantity of electricity consumed, an emission factor for electricity generation and a factor to account for transmission losses, as follows:

$$BE_{EC, y} = \sum EC_{BL, k, y} * EF_{EL, k, y} * (1 + TDL_{k, y}) \quad \text{Equation 1 in Baseline, project and/or leakage emissions from electricity consumption and monitoring of electricity generation, version 03.0}$$

Where:

$BE_{EC, y}$	Baseline emissions from electricity consumption in year y (tCO ₂ e/yr)
$EC_{BL, k, y}$	Net amount of electricity generated using LFG in year y (MWh/yr)
$EF_{EL, k, y}$	Emission factor for electricity generation source k in year y (tCO ₂ e/MWh)

TDL _{k,y}	Average technical and transmission and distribution losses for providing electricity to source k in year y
k	the sources of electricity generated by the grid

Determination of the Emission Factor for Electricity Generation (EF_{EL,k,y})

The emission factor of the Turkish grid (EF_{grid,CM,y}) is calculated by Ministry of Energy and Natural Resources in accordance with The Clean Development Mechanism method of the Intergovernmental Panel on Climate Change (IPCC) and published in Turkey National Network Grid Emission Factor Data Sheet²².

The CO₂ emission factor for the displacement of electricity generated by power plants in the project activity and fed to the grid is estimated using "Tool to calculate the emission factor for an electricity system", version 07.0. The estimation is carried out through following steps

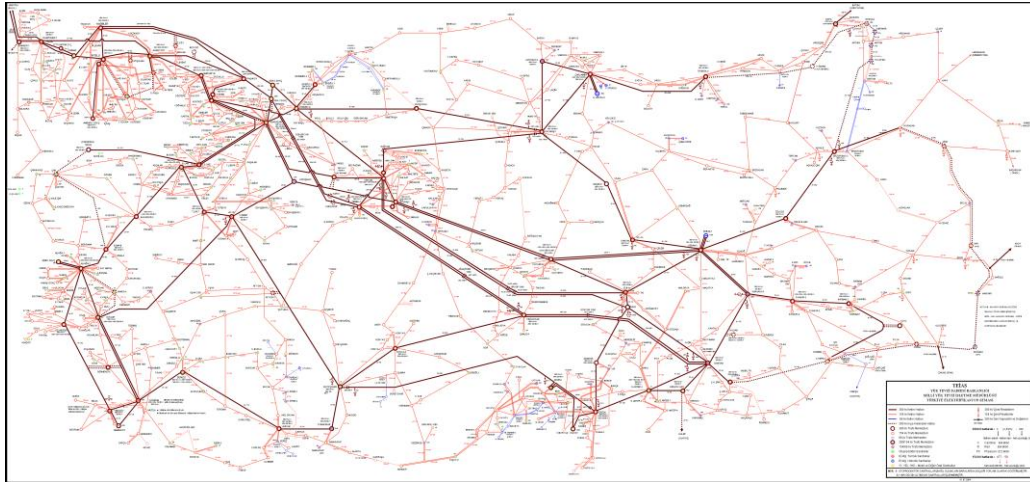
- (a) Step 1: Identify the relevant electricity systems;
- (b) Step 2: Choose whether to include off-grid power plants in the project electricity system (optional);
- (c) Step 3: Select a method to determine the operating margin (OM);
- (d) Step 4: Calculate the operating margin emission factor according to the selected method;
- (e) Step 5: Calculate the build margin (BM) emission factor;
- (f) Step 6: Calculate the combined margin (CM) emission factor.

Step 1: Identify the relevant electricity systems

As described in tool, "...For determining the electricity emission factors, identify the relevant project electricity system. Similarly, identify any connected electricity systems....". It also states that "If the DNA of the host country has published a delineation of the project electricity system and connected electricity systems, these delineations should be used".

Keeping this into consideration the delineation of the national grid of Turkey by "Türkiye Elektrik İletim A.Ş. Genel Müdürlüğü" is considered for estimation.

²² https://enerji.enerji.gov.tr/Media/Dizin/BHIM/tr/Duyurular/Bilgi_Formu_Web_Sitesi_2019_202110071443.pdf



Step 2: Choose whether to include off-grid power plants in the project electricity system (optional)

Project Developer has an option to choose between the following two options to calculate the operating margin and build margin emission factor:

Option I: Only grid power plants are included in the calculation.

Option II: Both grid power plants and off-grid power plants are included in the calculation.

The Project developer has chosen only grid power plants in the calculation.

Step 3: Select a method to determine the operating margin (OM)

The calculation of the operating margin emission factor ($EF_{grid,OM,y}$) is based on one of the following methods, which are described under Step 4:

- (a) Simple OM; or
- (b) Simple adjusted OM; or
- (c) Dispatch data analysis OM; or
- (d) Average OM.

The data required to calculate Simple adjusted OM and Dispatch data analysis OM is not possible due to lack of availability of data to project developers. The choice of other two options for calculating operating margin emission factor depends on generation of electricity from low-cost/must-run sources. In the context of the methodology low cost/must run resources typically include hydro, geothermal, wind, low-cost biomass, nuclear and solar generation.

Table: In accordance with Electricity Market Production Capacity Projections List (TWh)^{23\}

Years	2016	2017	2018	2019	2020	2021	Share in 2021 (%)
Lignite	61.24	61.33	61.33	61.33	61.33	61.33	14.26%
Hard Coal	5.91	5.91	5.91	5.91	5.91	5.91	1.37%
Imported Coal	37.90	39.63	39.67	39.67	39.67	26.82	6.23%

²³ [EMRA | Energy Market Regulatory Authority \(epdk.gov.tr\)](https://www.epdk.gov.tr/)

Natural Gas	175.07	175.15	176.01	175.79	176.01	176.01	40.91%
Geothermal	1.40	1.40	1.40	1.40	1.40	1.40	0.33%
Fuel Oil	9.22	9.22	9.22	9.22	9.22	9.22	2.14%
Diesel	0.15	0.15	0.15	0.15	0.15	0.15	0.03%
Nuclear	0	0	0	4.200	12.60	21.00	4.88%
Other	1.41	1.41	1.41	1.41	1.41	1.41	0.33%
Thermal Total	292.30	294.21	295.11	299.08	307.71	316.11	70.49%
Biogas + Waste	1.20	1.20	1.20	1.20	1.20	1.20	0.28%
Hydro	104.44	112.71	115.78	116.56	116.56	116.56	27.09%
Wind	9.21	9.21	9.21	9.21	9.21	9.21	2.14%
Total	407,148	417,317	421,292	426,044	434,670	443,070	100.0%

The above data clearly shows that the percentage of total grid generation by low-cost/ must-run plants (on the basis of average of five most recent years) for the national grid of Turkey is less than 50 % of the total generation capacity. Thus, the Average OM method cannot be applied, as low cost/must run resources constitute less than 50% of total grid generation. The simple OM emission factor is calculated as the generation-weighted average CO₂ emissions per unit net electricity generation (tCO₂/MWh) of all generating power plants serving the system, not including low-cost/must-run power plants/units.

For the simple OM, the simple adjusted OM and the average OM, the emissions factor can be calculated using either of the two following data vintages:

(a) Ex-ante option: if the ex-ante option is chosen, the emission factor is determined once at the validation stage, thus no monitoring and recalculation of the emissions factor during the crediting period is required.

OR

(b) Ex-post option: if the ex-post option is chosen, the emission factor is determined for the year in which the project activity displaces grid electricity, requiring the emissions factor to be updated annually during monitoring.

Step 4: Calculate the operating margin emission factor ($EF_{grid,OM,y}$) according to the selected method

For OM factor calculation, Chronological order of power generation plants from TEİAŞ Load Dispatch Department with, fuel types, electricity generation for the calculated year were used as input data. By using all the data which were mentioned above, Turkish Ministry of Energy and Natural Resources calculated $EF_{grid,OM,y}$ ²⁴:

$$EF_{grid,OM,y} = 0.7258 \text{ tCO}_2/\text{MWh}$$

Step 5: Calculate the build margin (BM) emission factor ($EF_{grid,BM,y}$)

As per Methodological tool: "Tool to calculate the emission factor for an electricity system" (Version 07.0, EB 100, Annex 4) para 72:

²⁴https://enerji.enerji.gov.tr/Media/Dizin/BHIM/tr/Duyurular//Bilgi_Formu_Web_Sitesi_2019_202110071443.pdf

In terms of vintage of data, project participants can choose between one of the following two options:

(a) Option 1 - for the first crediting period, calculate the build margin emission factor ex ante based on the most recent information available on units already built for sample group at the time of PDD submission to the DOE for project verification. For the second crediting period, the build margin emission factor should be updated based on the most recent information available on units already built at the time of submission of the request for renewal of the crediting period to the VVB. For the third crediting period, the build margin emission factor calculated for the second crediting period should be used. This option does not require monitoring the emission factor during the crediting period.

(b) Option 2 - For the first crediting period, the build margin emission factor shall be updated annually, ex post, including those units built up to the year of registration of the project activity or, if information up to the year of registration is not yet available, including those units built up to the latest year for which information is available. For the second crediting period, the build margin emissions factor shall be calculated ex ante, as described in Option 1 above. For the third crediting period, the build margin emission factor calculated for the second crediting period should be used.

Option 1 as described above is chosen by PP to calculate the build margin emission factor for the project activity. BM is calculated ex-ante based on the most recent information available at the time of submission of PDD and is fixed for the entire crediting period.

For BM factor calculation by Turkish Ministry of Energy and Natural Resources $EF_{grid,BM,y}$ ²⁵ chronological order of power generation plants from TEİAŞ Load Dispatch Department with commissioning dates, plant names, fuel types, installed power values, electricity generation for the calculated year were used as input data.

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

Step 6: Calculate the combined margin (CM) emission factor ($EF_{grid,CM,y}$)

As per Methodological tool: "Tool to calculate the emission factor for an electricity system", version 07.0, paragraph 81:

The calculation of the combined margin (CM) emission factor ($EF_{grid,CM,y}$) is based on one of the following methods:

- (a) Weighted average CM; or
- (b) Simplified CM

PP has chosen option (a) i.e weighted average CM to calculate the combined margin emission factor for the project activity.

²⁵ https://enerji.enerji.gov.tr/Media/Dizin/BHIM/tr/Duyurular//Bilgi_Formu_Web_Sitesi_2019_202110071443.pdf

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

$$EF_{grid,BM,y} = EF_{grid,OM,y} * W_{OM} + EF_{grid,BM,y} * W_{BM} \quad \text{Equation 16}$$

Where:

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

According to the Tool for power generation project activities other than wind and solar;
 $W_{OM} = 0.25$ and $W_{BM} = 0.75$ for the second crediting period.

Then:

$$EF_{grid,CM,y} = 0.7258 \text{ tCO}_2/\text{MWh} * 0.25 + 0.4153 \text{ tCO}_2/\text{MWh} * 0.75 = 0.4929 \text{ tCO}_2/\text{MWh}$$

$EF_{grid,CM,y} = 0.4929 \text{ tCO}_2/\text{MWh}$

Project Emissions

In accordance with the applied methodology, the project emissions are calculated as follows:

$$PE_y = PE_{EC,y} \quad \text{Equation 22 of the applied methodology}$$

Where:

$PE_{EC,y}$	Emission from consumption of electricity due to the project activity in year y (tCO ₂ e/yr).
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Since there are no consumption of fossil fuels due to the project activity, for the purpose other than electricity generation, there are no emissions from fossil fuel consumption and therefore $PE_{FC,y}$ is equal to "0" and has not been included in equation.

The project emissions from consumption of electricity by the project activity $PE_{EC,y}$ are calculated using the "Baseline, project and/or leakage emissions from electricity consumption and monitoring of electricity generation " Version 3.0.

$PE_{EC,y}$ is calculated as follows:

$$PE_{EC,y} = \sum EC_{PJ,y} * EF_{EL,j,y} * (1 + TDL_{j,y}) \quad \text{Equation 2 in of the applied tool}$$

Where:

$PE_{EC,y}$	Project emissions from electricity consumption in year y (tCO ₂ e/year)
$EC_{PJ,y}$	Quantity of electricity consumed by the project electricity consumption source j in year y (MWh/year)
$EF_{EL,j,y}$	Emission factor for electricity generation for source j in year y (tCO ₂ e/MWh)
$TDL_{j,y}$	Average technical transmission and distribution losses for providing electricity to source j in year y

The combined margin emission factor of the applicable electricity system, has been determined as emission factor for the electricity system ($EF_{EL,j,y}$), in line with Option A1 of scenario A (Electricity consumption from grid) under the “Baseline, project and/or leakage emissions from electricity consumption and monitoring of electricity generation ” Version 3.0.

Leakage

In accordance with the applied methodology - ACM0001, version 19.0, no leakage effects are accounted which is accepted as it is in line with paragraph 71 of the applied methodology.

VVB assessed and confirmed the parameters considered ex-ante and ex-post in the current GS PDD and the assessment is presented below:

Sr. No.	Data / Parameter	Description	Value	Assessment
1	OX_{top_layer}	Fraction of methane that would be oxidized in the top layer of the SWDS in the baseline	0.1	The value is considered based on methodological tool “Emissions from solid waste disposal sites, version 08.0” and is consistent with how oxidation is accounted for and found correct.
2	GWP_{CH_4}	Global warming potential of CH_4	28 tCO ₂ e/tCH ₄	The value applied is as per Default value from IPCC Sixth Assessment Report (AR6) available at https://www.ipcc.ch/assessment-report/ar6/ and found correct.
3	η_{PJ}	Efficiency of the LFG capture system that will be installed in the project activity	50%	The value applied is Default value under ACM0001, version 19.0 and hence accepted.
4	R_u	Universal ideal gases constant	8.314	The value applied is as referred under “Tool to determine the mass flow of a greenhouse gas in a gaseous stream” and hence accepted.
5	MM_{CH_4}	Molecular mass of CH_4	16.04	The value applied is As referred under “Tool to determine the mass flow of a greenhouse gas in a gaseous stream, version 03.0” and hence accepted.
6	$\Phi_{default}$	Default value for the model correction factor to account for	0.75	The value applied is as per the tool “Emissions from solid disposal sites, version 08.0” and hence accepted.

		model uncertainties																
7	OX	Oxidation factor (reflecting the amount of methane from SWDS that is oxidized in the soil or other material covering the waste)	0.1	The value is based on extensive review of published literature on this subject, including the IPCC 2006 Guidelines for National Greenhouse Gas Inventories and hence accepted.														
8	DOC _{f,default} _{it}	Default value for the fraction of degradable organic carbon (DOC) in MSW that can decompose in the SWDS	0.5	The value is based on extensive review of published literature on this subject, including the IPCC 2006 Guidelines for National Greenhouse Gas Inventories and hence accepted.														
9	MCF _{default}	Methane correction factor	0.8	This value is based on tool 04: Emissions from solid waste disposal sites, version 08.0 for unmanaged solid waste disposal sites – deep. This comprises all SWDS not meeting the criteria of managed SWDS and which have depths of greater than or equal to 5 meters. The value was cross checked and confirmed.														
10	DOC _j	Fraction of degradable organic carbon (by weight) in waste type j	<table><tr><th>Waste type j</th><th>DOC_i (% wet waste)</th></tr><tr><td>Wood and wood products</td><td>43</td></tr><tr><td>Pulp, paper and cardboard</td><td>40</td></tr><tr><td>Food, food waste, beverages and tobacco</td><td>15</td></tr><tr><td>Textiles</td><td>24</td></tr><tr><td>Garden, yard and park waste</td><td>20</td></tr><tr><td>Glass, plastic, metal, other inert</td><td>0</td></tr></table>	Waste type j	DOC _i (% wet waste)	Wood and wood products	43	Pulp, paper and cardboard	40	Food, food waste, beverages and tobacco	15	Textiles	24	Garden, yard and park waste	20	Glass, plastic, metal, other inert	0	The values are based on tool 04: Emissions from solid waste disposal sites, version 08.0. The value was cross checked and confirmed.
Waste type j	DOC _i (% wet waste)																	
Wood and wood products	43																	
Pulp, paper and cardboard	40																	
Food, food waste, beverages and tobacco	15																	
Textiles	24																	
Garden, yard and park waste	20																	
Glass, plastic, metal, other inert	0																	
11	k _j	Decay rate for the waste type j	<table><tr><td></td><td>Boreal and Temperate (MAT≤20° C)</td></tr></table>		Boreal and Temperate (MAT≤20° C)	The values are based on tool 04: Emissions from solid waste disposal sites, version 08.0. The value was cross checked and confirmed.												
	Boreal and Temperate (MAT≤20° C)																	

²⁶ <https://www.mgm.gov.tr/veridegerlendirme/il-ve-ilceler-istatistik.aspx?k=H>

				calculated the emission factor by using the "Tool to calculate the emission factor for an electricity system, version 07.0". Since it was updated in 07/10/2021 by the Ministry, these factors have been used for emission reduction calculation and found correct.
14	EF _{grid,CM,y}	Combined Margin CO ₂ emission factor in year y	0.4929 tCO ₂ e/MWh	The value is calculated in line with tool 07: Tool to calculate the emission factor for an electricity system, version 07.0 and confirmed.

Ex-post parameters accessed and the information is presented in the following table:

Sr. No.	Data / Parameter	Description	Observation
1	Op _{j,h}	Operation of the equipment that consumes the LFG	As per the registered PDD, plant equipment operation will be calculated in hour 'h' by monitoring the product generated i.e. electricity generation on an hourly basis. Data will be archived electronically during the crediting period and two years after.
2	V _{t,db}	Volumetric flow of the gaseous stream in time interval t on a dry basis	Generated gas will be monitored using volumetric flow meter in m ³ on continuous basis. The flow meter will be periodically calibrated against primary device of independent laboratory on a frequency specified by the manufacturer. Records of calibration and maintenance will be archived. Data will be archived electronically during the crediting period and two years after.
3	V _{CH₄,t,db}	Volumetric fraction of CH ₄ in a time interval t on a dry basis	The value of methane (CH ₄) will be continuously monitored using gas analyser on dry basis in m ³ . The gas analyser will be periodically calibrated against primary device of independent laboratory on a frequency specified by the manufacturer. Records of calibration and maintenance will be archived. Data will be archived electronically during the crediting period and two years after.
4	T _t	Temperature of the gaseous stream in time interval t	Gas temperature will be monitored on continuous basis in 'k' using analog or digital instrument. The temperature reading instrument will be periodically calibrated against primary device of independent laboratory on a frequency specified by the manufacturer. Records of calibration and maintenance will be archived. Data will be

			archived electronically during the crediting period and two years after.
5	EC _{BL,y}	Net amount of electricity generated using LFG by the project activity in year y	The generated electricity will be monitored using energy meters on continuous basis and monthly readings will be recorded. These energy meters are used to measure net electricity export to the electricity grid and the net export is used for billing purpose by PD. The meters are sealed by TEIAS (Turkish Electricity Transmission Co.). The meters will be calibrated as per TEIAS norms ²⁸ . Records of calibration and maintenance will be archived. Data will be archived electronically during the crediting period and two years after.
6	EC _{Pj,y}	Quantity of electricity consumed by the project activity	The electricity consumed will be monitored using energy meters on continuous basis and monthly readings will be recorded. These energy meters are used to measure energy consumption by the project activity. The meters are sealed by TEIAS (Turkish Electricity Transmission Co.). The meters will be calibrated as per TEIAS norms. Records of calibration and maintenance will be archived. Data will be archived electronically during the crediting period and two years after.
7	TDL _{j,y}	Average technical transmission and distribution losses for providing electricity for source j, in year y	The grid company calculates the TDL factor monthly and will use the factor directly for the creation of the monthly reports. The value will be monitored annually and in the absence of the data from the relevant year, most recent figures should be used. Data will be archived electronically during the crediting period and two years after
8	Number of Employment Generation	Number of people employed directly due to the project activity	Plant records or the training records for all the employees/SSI Records/Letter from O&M independent for employment generation/VVB interview with employees, local stakeholders etc. to be checked to confirm the monitored number. The staff register/ HR records for income generation of staff/ HR Policies regarding health insurance/social security is checked for staff income generation and company policy benefits. This parameter also monitors number of men/women employed by the project activity. The project activity ensures that "equal pay for work of equal value" for

²⁸ In accordance with the Regulation on metering equipment's, the calibration frequency is set for a 10-year period.
 Reference: <http://www.mevzuat.gov.tr/Metin.Aspx?MevzuatKod=7.5.12316&MevzuatIliski=0&sourceXmlSearch=>

			both men and women and there is no any discrimination against women.
9	Quality of Employment	Training to staff	Plant records or training records for all the employees/Letter from O&M contractor for employment generation/VVB interview with employees, local stakeholders etc. to be checked to confirm the monitored number. Together with the technology supplier, the Project proponent will organise training for the staff on the technology and the monitoring of the plant operation, and the emergency and safety procedures.

SDG 13 Climate Action

Parameter: GHG Emission Reduction

Year	Baseline estimate	Project estimate	Leakage estimate	Net benefit
01/08/2022-31/07/2023	250,723	2,296	0	248,427
01/08/2023-31/07/2024	255,074	2,296	0	252,778
01/08/2024-31/07/2025	259,352	2,296	0	257,056
01/08/2025-31/07/2026	263,571	2,296	0	261,275
01/08/2026-31/07/2027	267,743	2,296	0	265,447
01/08/2027-31/07/2028	271,879	2,296	0	269,583
01/08/2028-31/07/2029	275,987	2,296	0	273,691
Total	1,844,329	16,071	0	1,828,257
Total number of crediting years	7			
Annual average over the crediting period	263,476	2,296	0	261,180

VVB confirmed that due to delay in the completion of re-validation beyond the last date of 1st Crediting Period, no ERs will be issued for the delayed period (i.e., 18/05/2019 to 31/07/2022).

SDG 7: Affordable and Clean Energy

Parameter: Amount of Clean electricity supplied to grid (MWh)

Year	Baseline estimate	Project estimate	Net benefit
01/08/2022-31/07/2023	0	68,600	68,600
01/08/2023-31/07/2024	0	68,600	68,600
01/08/2024-31/07/2025	0	68,600	68,600
01/08/2025-31/07/2026	0	68,600	68,600
01/08/2026-31/07/2027	0	68,600	68,600
01/08/2027-31/07/2028	0	68,600	68,600
01/08/2028-31/07/2029	0	68,600	68,600
Total	0	480,200	480,200

Total number of crediting years	7		
Annual average over the crediting period	0	68,600	68,600

SDG 8: Decent Work and Economic Growth

Parameter: Number of Jobs created

Year	Baseline estimate	Project estimate	Net benefit
01/08/2022-31/07/2023	0	Jobs- 05, training – 01	Jobs- 05, training - 01
01/08/2023-31/07/2024	0	Jobs- 05, training - 01	Jobs- 05, training - 01
01/08/2024-31/07/2025	0	Jobs- 05, training - 01	Jobs- 05, training - 01
01/08/2025-31/07/2026	0	Jobs- 05, training - 01	Jobs- 05, training - 01
01/08/2026-31/07/2027	0	Jobs- 05, training – 01	Jobs- 05, training - 01
01/08/2027-31/07/2028	0	Jobs- 05, training - 01	Jobs- 05, training - 01
01/08/2028-31/07/2029	0	Jobs- 05, training - 01	Jobs- 05, training - 01
Total	0	Jobs- 05, training - 01	Jobs- 05, training - 01
Total number of crediting years	7		
Annual average over the crediting period	0	Jobs- 05, training - 01	Jobs- 05, training - 01

4. REFERENCE

S. No.	Document/Evidence/Reference/Web blink, Version, Date
1	GS-PDD for 1 st crediting period Version 12 dated 18/12/2013
2	Validation report for 1 st crediting period Version 02 dated 31/01/2013
3	GS PDD for current crediting period , version 05 dated 21/10/2022
4	Emission reduction Sheet version 2 dated 15/07/2022
5	Verification report for the period 19/05/2012 to 31/05/2013 Version 1.3Aa dated 06/04/2015
6	GS deviation request form dated 17/01/2022
7	ACM0001: Flaring or use of landfill gas, version 19.0
8	Tool 02: Combined tool to identify the baseline scenario and demonstrate additionality”, version 07.0.0
9	Tool 04: Emissions from solid waste disposal sites, version 08.0
10	Tool 05: Baseline, project and/or leakage emissions from electricity consumption and monitoring of electricity generation, version 05.0
11	Tool 07: Tool to calculate the emission factor for an electricity system, version 07.0
12	Tool 08: Tool to determine the mass flow of a greenhouse gas in a gaseous stream” Version 03.0
13	Tool 14: Project and leakage emissions from anaerobic digesters, version 02
14	Tool 11: Assessment of the validity of the original/current baseline and update of the baseline at the renewal of the crediting period, version 03.0.1

S. No.	Document/Evidence/Reference/Web link, Version, Date
15	CDM project standard for project activities, version 03.0
16	CDM validation and verification standard for project activities, version 03.0
17	The Gold Standard for Global Goals "Principles and Requirements" Version 1.2
18	Community Services Activity Requirements, version 1.2
19	Renewable Energy Activity Requirements, version 1.4
20	Commissioning reports for the project activity
21	Google map software to cross check the geographical co-ordinates
22	GS4GG Site Visit and Remote Audit Requirements and Procedures, version 01
23	Turkey National Network Grid Emission Factor Data Sheet

5. **FINAL PROJECT DESIGN CERTIFICATION RENEWAL STATEMENT**

Applus+ Certification have performed an RCP validation of the "Bursa-Hamitler Landfill Gas Collection and Energy Utilization Project". The RCP validation was performed on the basis of UNFCCC criteria of CDM validation and verification standard for project activities, Version 03.0, Gold Standard GS4GG guideline and host country criteria, as well as criteria given to provide for consistent project operations, monitoring and reporting.

The review of the GS4GG PDD and the subsequent follow-up interviews has provided Applus+ Certification with sufficient evidence to determine the fulfillment of stated criteria. In our opinion, the project meets all relevant UNFCCC and Gold Standard requirements for the Gold Standard and all relevant host country criteria. The project will hence be recommended by Applus+ Certification for renewal of crediting period with the Gold Standard Registry.

By recovering, preventing and utilization of methane and by displacing fossil fuel-based electricity with electricity generated from a renewable source, the project results in reductions of CO₂ emissions that are real, measurable and give long-term benefits to the mitigation of climate change. Emission reductions attributable to the project are hence additional to any that would occur in the absence of the project activity. Given that the project is implemented as designed, the project is likely to achieve the estimated amount of average annual emission reductions of 261,180 tCO₂e per year.

The RCP validation has been performed following the requirements of the latest version of the CDM validation and verification standard for project activities, Version 03.0, Gold Standard GS4GG guideline and on the basis of the contractual agreement.

In detail the conclusions can be summarized as follows:

- The project does not result in negative social, environmental and/or economic impacts.
- The project contribution to Environment, Social Development and Economic and technological development
- The project additionality is sufficiently justified in the Gold Standard PDD
- The project does not result in diversion of ODA.
- Conservative assumptions were applied in the project description.
- The monitoring plan of SD parameters is transparent and adequate.

- The project meets the stakeholder consultation requirements.

The conclusions of this report show, that the project, as it was described in the project documentation, is in line with all criteria applicable for the RCP validation.

Date: 02/11/2022

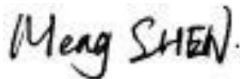
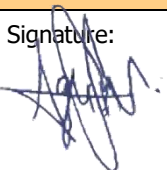
Lead Auditor: Mr. Pankaj Kumar

Tech. Expert: Mr. Pankaj Kumar

Tech. Reviewer: Mr. Simon Shen

Approver (*Applus+ Certification VVB Technical Manager*)

Mr. Agustín Calle de Miguel

ASSESSMENT TEAM	
Lead Auditor: Mr. Pankaj Kumar	Technical Reviewer: Mr. Simon Shen
Signature: 	Signature: 
Approver: Mr. Agustín Calle de Miguel	
Signature: 	

Appendix 1: Corrective Action Request/Clarification Request/Forward Action Request resolution table

Type:	☐ CAR ☒ CL/CR ☐ FAR	Number:	01
Raised by:	Pankaj Kumar		
Description of the audit finding	Date:	20/04/2022	
• PD requested to submit Design Review by GS for CP 1, GS Validation Report and latest performance review completed by GS. • PD requested to submit commissioning certificates, Nodal Agency approval and PPA in support of legal ownership of the project activity. • PD requested to submit Declaration confirming that there would not be double counting of credits for any particular monitoring period under any other GHG mechanism other than GS. • The supporting documents related to Data and parameters to be monitored is not submitted to assessment team. PD shall also provide evidence for the employment generated by the project activity.			
Project Participant's response	Date:	20/08/2022	
1. Design Review by GS for CP 1, GS Validation Report and latest performance review completed by GS are shared. 2. Commissioning certificates EÜ/3519-39/2166 dated 19/05/2012 for total cumulative capacity of 5x1.400 MW, EÜ/3519-39/2166 dated 27/07/2012 for total cumulative capacity of 1 x 1.400 MW, EÜ/3519-39/2166 dated 07/09/2012 for total cumulative capacity of 1 x 1.400 MW issued by Ministry of Energy and Natural Resources is submitted to establish the legal ownership of the project proponent on the project activity is submitted ("1. Project Information" folder). Generation License (EU/10758-2/05123) dated 03/02/2022 issued by Energy Market Regulatory Authority along with PPA is submitted to establish the legal ownership of the project proponent on the project activity. The details of project ownership reference included under section A.1.2 of the revised GS-PDD. 3. Declaration by Project Proponent submitted to confirm that there would not be double counting of credits for any particular monitoring period under any other GHG mechanism other than GS is shared in "8. Certification Declaration" folder. 4. For electricity generation; Electricity Invoices, EPIAS Screenshots and Meter Reading Forms to substantiate data and parameters monitored are shared in "4. Generation Documents" folder. Record of training and employment submitted in "7. Employment and Trainings" folder.			
Documentation provided as evidence by Project Participant			
1. GS1068_8-Week_Review_Final_Round_27012014, 4_Bursa_GS_LFG_FVR_02_Approved_20130926, GS1068 Issuance Review Period 1st MP_23.03.2015 Design Review by GS for CP 1, GS Validation Report and latest performance review completed by GS are shared in "5. GS Documents" folder. 2. Commissioning certificates are in "1. Project Information" folder. Nodal Agency approval is shared as "Generation License" along with PPA in "1. Project Information" folder. 3. "Certification Declaration" is shared in "8. Certification Declaration" folder. 4. For electricity generation; Electricity Invoices, EPIAS Screenshots and Meter Reading Forms are shared in "4. Generation Documents" folder. For employment; please refer to "7. Employment and Trainings" folder.			
Auditor's assessment comment	Date:		
1. PD has submitted GS design review 27/01/2014, issuance review dated 23/03/2015 and validation report by DNV version 02 dated 26/09/2013 was checked to confirm that no FAR is			

still open. The verification report for 1st monitoring period version 1.3Aa dated 06/04/2015 confirmed that 2 FARs were raised during performance review which were closed as a part of verification and no FAR is open. Hence this part of CL is closed. 2. The submitted commissioning certificates, generation license were checked and project ownership with the PD was confirmed by VVB. Hence this part of CL is closed. 3. PP has submitted the required declaration dated 16/05/2022 which was checked and found appropriate. Hence this part of CL is closed. 4. PP has submitted electricity generation; Electricity Invoices, EPIAS Screenshots and Meter Reading Forms which were checked to confirm the monitoring plan for the parameters monitored and records of training and employment which further confirmed the employment and training details as mentioned in the GS PDD. Hence this part of CL is closed. CL is closed.
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Type:	☒ CAR ☐ CL/CR ☐ FAR	Number:	01
Raised by:	Pankaj Kumar		
Description of the audit finding	Date:	19/04/2022	
1. PD shall maintain consistent font, font colour and size throughout the GS PDD. Also, date format shall be consistent as DD/MM/YYYY			
2. PD has made reference to 'Tool for the demonstration and assessment of additionality'. This is not the correct nomenclature for the said tool and shall be corrected. Latest version of the same shall be used and mentioned throughout GS PDD			
Project Participant's response	Date:	20/08/2022	
1. GS PDD format is revised as per GS PDD template Version 1.2.			
2. The reference of the Tool for the demonstration and assessment of additionality Version 07 is corrected.			
Documentation provided as evidence by Project Participant			
1. Revised PDD			
Auditor's assessment comment	Date:	01/09/2022	
1. Revised PDD version 03 dated 20/08/2022 was checked to confirm PD has now made font, font colour, size and date format consistent throughout GS PDD. Hence this part of CAR is closed.			
2. PD response is unclear. The registered GS PDD does not refer to this tool. Further, PD has referred to 'Combined tool to identify the baseline scenario and demonstrate additionality' too in the GS PDD. It is not clear to VVB why these 2 tools are used by PD. Hence, this part of CAR is open.			
CAR is open			
Project Participant's response	Date:		
Section B.1 of the revised PDD only refers to Combined tool to identify the baseline scenario and demonstrate additionality" Version 07.0.0.			
Documentation provided as evidence by Project Participant			
Revised PDD			
Auditor's assessment comment	Date:	30/09/2022	
The latest PDD was checked to confirm that reference to the tool for demonstration of additionality has been removed and correct tool i. e. Combined tool to identify the baseline scenario and demonstrate additionality is being added and its applicability is demonstrated in the section B.4. Hence, this CAR is closed.			

Type:	☒ CAR	☐ CL/CR	☐ FAR	Number:	02
Raised by:	Pankaj Kumar				
Description of the audit finding				Date:	19/04/2022
1. In section B.4,					

a. step 1.b mentions related laws and regulations for the proposed project activity. However, the weblinks provided are not working and hence assessment team cannot check whether these are the latest applicable laws and regulations. The correct weblinks shall be provided. b. step 2 mentions 'Combined tool to identify the baseline scenario and demonstrate the additionality' with the applied version as version 05.0.0 which is not the latest version available. c. Under the table in outcome of step 2, it is mentioned '.....The grid emission factor (presented above) is revised at the point renewal.....' which is incorrect and shall be revised as no information is provided in above sections before this table. 2. In section B.6.1, version number of 'Tool to determine the mass flow of a greenhouse gas in a gaseous stream' is inconsistent as both version 02 and 03 are referred. 3. In section B.6.1, under option A, parameter $F_{CH_4,t}$ is mentioned as $F_{CH,t}$. Correction for consistency is required. 4. The equation referencing based on applicable methodology ACM0001 is incorrect and shall be corrected. E.g. in GS PDD, section B.6.1, step A.1.1 Ex-ante estimation of $F_{CH_4,PJ,y}$ mentions - $F_{CH_4,PJ,y} = \eta_{PJ} * BE_{CH_4,SWDS,y} / GWP_{CH_4}$ as equation 11 from the methodology however, this equation is equation 05 in the methodology. PD shall re-check referencing of all equations with respect to applied methodology and tool and correct as applicable. It is observed that PD has provided numbers to be equations which are not as per the tool/methodology. PD shall either provide equation numbers as per the applicable tool/methodology or provide reference of which equation from tool/methodology this number refers to. 5. In section B.6.1, under Determining the amounts of waste types j disposed in the SWDS (W_j,x), it is mentioned that '..... In total approximately 8 million tons of MSW is estimated to accumulate between 1996 and 2011.....' This shall be revised and corrected for the renewal of crediting period and latest period shall be used. 6. In section B.6.1, step B mentions 'Tool to calculate baseline, project and leakage emissions from electricity consumption'. The tool name is changed and version applied in the GS PDD is incorrect. Same shall be checked and corrected under Project emissions too. 7. In section B.6.1, for Determination of the emission factor for electricity generation, 'Tool to calculate the emission factor of an electricity system' version 07.0 is applied. As per para 14 of the applied tool, PD shall apply 6 steps for calculation of emission factors which are not found in the submitted GS PDD.		
Project Participant's response	Date:	20/08/2022
1.a. Weblinks are corrected in step 1.b under Section B.4. 1.b. It is corrected as 'Combined tool to identify the baseline scenario and demonstrate the additionality' Version 7 in step 2 under Section B.4. 1.c. The mentioned sentence is corrected in outcome of step 2 under Section B.4. 2. Version number of "Tool to determine the mass flow of a greenhouse gas in a gaseous stream" is corrected as Version 03 in Section B.6.1. 3. $F_{CH_4,t}$ parameter notation is corrected in Section B.6.1. 4. The reference numbers of equations are corrected as per methodologies and tools in Section B.6.1. 5. The indicated sentence and values are corrected in Section B.6.1. 6. Tool name is corrected as "Baseline, project and/or leakage emissions from electricity consumption and monitoring of electricity generation " Version 3.0 in Section B.6.1 and in the rest of PDD. 7. The combined margin emission factor has been estimated in accordance with the Tool to calculate the emission factor of an electricity system' version 07.0		
Documentation provided as evidence by Project Participant		
1. Revised PDD		
Auditor's assessment comment	Date:	01/09/2022
1. In revised GS PDD version 03, PD has revised section B.4 and, a. step 1.b now provides correct weblinks which were checked and confirmed.		

b.	The version of 'Combined tool to identify the baseline scenario and demonstrate the additionality' is now corrected to version 07.0.0 which is checked and confirmed.
c.	The sentence is now corrected which is checked and confirmed.
Hence this part of CAR is closed.	
2.	In revised GS PDD version 03, PD has revised section B.6.1 and correct version i.e. 03 is now mentioned which is checked and confirmed. Hence this part of CAR is closed.
3.	In revised GS PDD version 03, section B.6.1 is now revised to mention the parameter correctly as $F_{CH_4,t}$ which is checked and confirmed. Hence this part of CAR is closed.
4.	In revised GS PDD version 03, PD has correctly referred the equation numbers as per the applied methodology/tools which is checked and confirmed. Hence this part of CAR is closed.
5.	In revised GS PDD version 03, PD has revised section B.6.1 which is checked and confirmed. Hence this part of CAR is closed.
6.	In revised GS PDD version 03, PD has revised section B.6.1, step B to mention correct name of tool as "Baseline, project and/or leakage emissions from electricity consumption and monitoring of electricity generation which is checked and confirmed. Hence this part of CAR is closed.
7.	In revised GS PDD version 03, PD has revised section B.6.1 and all the applicable 6 steps of 'Tool to calculate the emission factor of an electricity system' version 07.0 are now correctly shown and justified. Hence this part of CAR is closed.
CAR is closed.	

Type:	☒ CAR ☐ CL/CR ☐ FAR	Number:	03
Raised by:	Pankaj Kumar		
Description of the audit finding		Date:	19/04/2022
In section B.6.3, emission reduction is considered from the year 2019. AS per Principles and Requirements paragraph 5.1.46, <i>Delay in the completion of re-validation beyond the last date of current certification cycle shall result in a reduction of any issuance of Certified Products and/or Impact Statements available during following certification cycle (for example, a delay of 1 year beyond the first cycle shall mean that no Certified Impact Statements shall be issued for the period of delay).</i>			
As per the registered GS-PDD, current certification cycle has ended in year 2019 and design certification renewal request is submitted in the year 2022. PD shall correct the crediting years mentioned accordingly.			
Project Participant's response		Date:	20/08/2022
The crediting period have been modified to 01/08/2022 -31/07/2029 in the revised version of the PDD.			
Documentation provided as evidence by Project Participant			
Revised PDD			
Auditor's assessment comment		Date:	01/09/2022
In revised GS PDD version 03, crediting period is now correctly mentioned as 01/08/2022 to 31/07/2029 which is checked and confirmed. Further, VVB has also checked the deviation request form dated 17/01/2022 which also confirms that PD's request was rejected and the current crediting period is appropriate.			
CAR is closed.			

Type:	☒ CAR ☐ CL/CR ☐ FAR	Number:	04
Raised by:	Pankaj Kumar		
Description of the audit finding		Date:	19/04/2022
In line with template guide for Project Design Document;			
- In section A.4, <i>Justify the scale referring to the applied Activity Requirements</i> - In section C.1.1, <i>State (and supply a copy where relevant) the evidence proving this date and</i> <i>As per GS4GG Principle 4, Justify if the project is regular, or retroactive and ensure KPI table matches.</i>			

3. In section C.1.2, <i>Specify in years and months how long the project will be active.</i>		
Project Participant's response	Date:	20/08/2022
1. The scale of project is justified under section A.4 in accordance to the GS Product Requirement - GHG Emissions Reduction & Sequestration Product Requirements, Version 2.1. 2. A. The start date of the Project activity relates to date of construction agreement and is elaborated in section C.1.1 of the revised PDD. B. The Project is a "regular" project activity as per Paragraph 4.1.42 of the Principles and Requirement Version 1.2 as the Local Stakeholders Consultation Meeting was carried out (on 21/04/2011) before the start date of the project activity which is 20/06/2011. Section C.1. of the PDD is revised accordingly 3. Expected operational lifetime of project is specified as per request.		
Documentation provided as evidence by Project Participant		
1. Revised GS-PDD. 2. Construction agreement in "1. Project Information" folder.		
Auditor's assessment comment	Date:	01/09/2022
Revised GS-PDD version 03 was checked and following issues were checked, 1. Section A.4 is now revised and scale is justified in line with the applicable requirement which is checked and confirmed. Hence this part of CAR is closed. 2. In section C.1.1, <i>PD has revised section mentioning the evidence which proved the project is regular which is correct and confirmed. Hence this part of CAR is closed.</i> 3. <i>Section C.1.2 is revised to mention operational lifetime as 28 years 3 months 2 days which is in line with the template guidelines and hence accepted.</i> CAR is closed.		

Appendix 2: Audit Team CVs

Name	SHORT CV. BACKGROUND INFORMATION
Mr. Pankaj Kumar	Mr. Pankaj Kumar worked as team leader – Bihar for South Asia Climate Proofing and Growth Development (CPGD) – Climate Change Innovation Programme (CCIP) supported by DFID that seeks to mainstream climate change resilience into planning and budgeting at the national and sub-national level in India , Pakistan, Nepal, and Afghanistan. Pankaj Kumar has worked previously with IL&FS Infrastructure Development Corporation and BUIDCO (Bihar Urban Infrastructure Development Corporation), Govt. Of Bihar as Environmental Specialist for WB & ADB funded projects. Prior to this, he worked with Carbon Check (UNFCCC accredited VVB), Johannesburg, RSA as Team Leader for validation, verification of around 100 GHG projects in Asia, Africa, USA, Asia Pacific & Americas. Pankaj is accredited Lead Auditor, Validator, Verifier and Technical Expert for Sectoral Scope/Technical Area – 1.1, 1.2, 3.1 & 13.1 by UNFCCC DoE (Designated Operational Entity), APPLUS, Spain. He is also member of task force on climate change & human health, Health Department, GoB and on roster of UNICEF's WASH experts. He is an experienced, qualified and result oriented Environment Professional having more than 14 yrs. Of relevant experience in Climate Change (Mitigation & Adaptation), Environmental Due Diligence, Disaster Risk Reduction, Validation and Verification of GHG project under CDM, Verified Carbon Standard, Gold Standard & Social Carbon Standard, Brazil. He provides technical support for environmental investigative, consultative and remedial projects involving air, water and soil, Waste management, EIA, Environmental Compliance, ISO 14001, OHSAS 18001, GHG accounting (ISO 14064) and Carbon foot printing. Pankaj Kumar is Masters in Environment Management from Forest Research Institute (University), I.C.F.R.E, Dehradun, which is Centre of Excellence in South East Asia for Forestry education & research and PGDEL from National Law School of India University, Bangalore (India)
Mr. Simon Shen	Mr. Simon Shen (Master Degree in Thermal Energy Engineering, Bachelor Degree in Environmental Engineering) is a Lead Auditor appointed by Applus+ LGAI for the GHG project assessment. He is based in Shanghai. He has several years of work experience in environmental protection field. Before he joined Applus+ LGAI, he had been worked for TÜV SÜD as a GHG Validator/Assessment team and ISO 9001/14001 Lead Auditor for 3.5 years. before he joined Applus+. Mr. Simon Shen has extensive experience also as former Applus+ Shanghai CDM Technical Manager. Mr. Simon Shen is based in Shanghai, China. Mr. Simon Shen participates in the project's technical review team.