

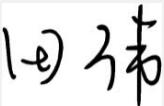


GUANGZHOU EASTERN SOLID RESOURCE RECYCLING CENTER MSW INTEGRATED TREATMENT PLANT PROJECT



Document Prepared By China Classification Society Certification Co. Ltd.

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Project ID	2746
Verification period	01-January-2023 to 31-December-2023 (both days included)
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Client	Climate Bridge (Shanghai) Ltd.
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Summary:	

China Classification Society Certification Co. Ltd. (CCSC), commissioned by Climate Bridge (Shanghai) Ltd., has performed the 3rd periodic verification of Guangzhou Eastern Solid Resource Recycling Center MSW Integrated Treatment Plant Project (hereafter referred to as "the Project") covering the monitoring period from 01-January-2023 to 31-December-2023 with both days included, on the basis of requirements of VCS standard version 4.7.

- A description of the verification of the project

The project is a MSW Integrated treatment and electricity generation project, which is treating MSW with anaerobic digesters of fresh waste from Guangzhou City and utilizing recovered biogas for electricity generation. The project was owned and implemented by Guangzhou LEO-KING Environmental Technology Co., Ltd at the Solid Resource Recycling Center, Fushan Village, Jiulong Town, Luogang District, Guangzhou City, Guangdong Province, P.R China. The geographical coordinates for the project site are east longitude 113°30'54" and north latitude 23°17'4". After implementing validation under the VCS program, the project was allocated with VCS ID 2746.

The project activity includes MSW collection, MSW pre-treatment system, biodiesel production system, anaerobic digester, biogas purification, electricity generation system and waste heat recovery. The design processing capacity of the project is 2,040 tonnes fresh waste per day. The fresh waste of the project is mainly kitchen and catering waste from Guangzhou City. The total installed capacity of the project activity is 10.45 MW, consisting of

4 sets of 1.053 MW generators and 2 sets of 3.119 MW generators. In terms of the biodiesel production system and waste heat recovery, waste oil sourced from MSW pre-treatment system will be used for biodiesel production, and the waste heat will be recovered to be the source of heat supply for the operation. The project can reduce GHG emissions by replacing the electricity generated by fossil fuel fired power plants of China Southern Power Grid (CSPG). The project utilizes biogas recovered from anaerobic digestion to avoid the emission of methane that would otherwise be vented into the atmosphere at the landfill site. To be conservative, emission reductions will not be claimed for waste heat recovery and biodiesel production system. In addition, the project owner also purchases part of surplus biogas for power generation since January 2023 from a fresh waste anaerobic digestion project (started operation in 2022, later than the operation start date of the project) of Grandtop Fushan Environmental Protection Energy Co. LTD.

The project started construction on 12-October-2017. The first day of operation is 01-April-2020, which is also considered as the start date of the crediting period. The annual average amount of exported electricity is estimated to be 61,842 MWh in the three 7-year renewable crediting periods from 01-April-2020 to 31-March-2041. And the expected total emission reductions are 2,513,097 tCO₂e during the first crediting period, with average annual emission reductions 359,014 tCO₂e.

The actual emission reductions achieved in this monitoring period from 01-January-2023 to 31-December-2023 are 320,811 tCO₂e.

- The purpose and scope of verification

The objective of verification is to have an independent review ex-post determination by a VVB (Validation and Verification Body) of the monitored GHG emission reductions that have occurred as a result of the implementation of the project during a defined monitoring period.

- The monitoring period

The first monitoring period is from 01-April-2020 to 31-December-2021 with both days included. The second monitoring period is from 01-January-2022 to 31-December-2022 with both days included. This monitoring period is the 3rd VCS monitoring period. This monitoring period is from 01-January-2023 to 31-December-2023 (both days included).

- The method and criteria used for verification

The verification was performed on the basis of VCS Program Guide version 4.4 and VCS standard version 4.7 for the VCS projects, as well as criteria given to provide consistent project operations, monitoring and reporting. The verification was conducted by means of document review, follow-up interviews and site inspections, and the resolution of outstanding issues.

- The number of findings raised during verification

CCSC appointed a qualified verification team in accordance with internal procedures to perform the verification. During the verification, 2 Clarification Requests (CLs), 1 Corrective Action Requests (CAR) and no forward action request (FAR) were raised.

- Any uncertainties associated with the verification

There are no restrictions of uncertainty with the verification.

- Summary of the verification conclusion

As a result of this verification, the verification team confirms that:

The verification is based on the baseline and monitoring methodology ACM0022 Version 03.0, and the joint PD & MR (version 2.2 dated 19-Feb-2025). The project proponents are responsible for the collection, calculation and determination of the GHG data in accordance with the monitoring plan and the reporting of GHG emission reductions on the basis set out within the joint PD & MR. Our verification approach was based on the requirements as defined under the applicable VCS standard version 4.7 and relevant UNFCCC requirements. Our approach is risk-based, drawing on an understanding of the risks associated with reporting GHG emissions data and the controls in place to mitigate these. The verification can confirm that:

- the monitoring plan in joint PD & MR is as per the applied methodology;
 - the monitoring complies with the monitoring plan in the joint PD & MR;
 - the joint PD & MR and other supporting documents provided are complete and verifiable and in accordance with the applicable VCS standard version 4.7 and CDM requirements;
 - the installed equipment being essential for generating emission reduction runs reliably and is maintained or calibrated appropriately according to relevant regulations;
 - the monitoring system is in place and generates GHG emission reductions data;
 - the GHG emission reductions are calculated without material misstatements.
 - All operations of the project are implemented and installed as planned and described in the validated joint PD & MR;
 - The registered monitoring plan is in accordance with the applied baseline and monitoring methodology for the project:
- “ACM0022 Alternative waste treatment processes (Version 03.0).
- “TOOL04: Emissions from solid waste disposal sites” (version 08.0);
- “TOOL14: Project and leakage emissions from anaerobic digesters” (version 02.0);
- “TOOL07: Tool to calculate the emission factor for an electricity system” (version 07.0);

“TOOL05: Baseline, project and/or leakage emissions from electricity consumption and monitoring of electricity generation” (version 03.0);

“TOOL08: Tool to determine the mass flow of a greenhouse gas in a gaseous stream” (version 03.0);

“TOOL06: Project emissions from flaring” (version 04.0);

Based on the information observed and evaluated, the verification team confirms that the emission reductions are correctly calculated in the MR (version 2.1 dated 19-February-2025).

In conclusion, it is CCSC's opinion that the project “Guangzhou Eastern Solid Resource Recycling Center MSW Integrated Treatment Plant Project”, as described in the MR (version 2.1 dated 19-February-2025), meets all relevant requirements for VCS and all relevant host Party criteria. Hence, CCSC is able to certify that the emission reductions from the project during the monitoring period from 01-January-2023 to 31-December-2023 (both days included) amount to 320,811 tCO₂e and requests issuance of the equivalent VCUs.

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1 INTRODUCTION

1.1 Objective

Climate Bridge (Shanghai) Ltd., has commissioned CCSC to verify and provide a verification statement of the emission reductions of the “Guangzhou Eastern Solid Resource Recycling Center MSW Integrated Treatment Plant Project” for the monitoring period from 01-January-2023 to 31-December-2023, based on the requirement of VCS Standard (version 4.7) /06/ as well as criteria to provide for consistent project operations, monitoring and reporting.

As the verification body (VVB) of the project, CCSC has been accredited as a DOE by UNFCCC and meets the competence requirements as set out in ISO 14065:2020.

Verification of emission reductions from a project activity is the independent review and ex post determination by VVB of the monitored reductions in GHG emissions during the reported monitoring period. The objectives of verification are to:

- a) Ensure that the project has been implemented and operated as per the VCS project description and monitoring report (VCS-joint PD&MR) /03/ and that all physical features (technology, project equipment, and monitoring and metering equipment) of the project are in place;
- b) Ensure that the monitoring report and other supporting documents provided are completely in accordance with the latest applicable version of Registration and Issuance Process (version 4.4) /08/ and in accordance with the additional requirements stated by the VERRA;
- c) Ensure that actual monitoring systems and procedures comply with the monitoring systems and procedures described in the monitoring plan and the approved methodology /11//21//22//23//24//25//26//27/;
- d) Evaluate the data recorded and stored as per the monitoring methodology /11//21//22//23//24//25//26//27/.

1.2 Scope and Criteria

The verification scope encompasses an independent and objective review and ex-post determination of the monitored reductions in GHG emissions by the CCSC. The verification scope covers the relevant documents (e.g. the VCS-joint PD&MR) /03/, the VCS

monitoring report (VCS-MR) /01/, the emission reduction calculation spreadsheet (ER calculation spreadsheet) /02/, supporting documents available to the verifier and information collected through performing interviews and during the on-site assessment, VERRA's requirements publicly available, relevant rules, including the host country legislation, etc.) to be independently reviewed, the project geographical locations to be visited on-site, the related project local stakeholders to be interviewed with, and processes that are necessary to acquire objective evidence for the evaluation of the project compliance to the VCS requirements and associated interpretations.

The above verification activities are conducted according to the VERRA's requirements. In doing so, the principles of accuracy and completeness, relevance, reliability and credibility were followed.

The verification is not meant to provide any consulting service towards the PPs. However, stated requests for clarifications and/or corrective actions may provide input for improvement of the project.

1.3 Level of Assurance

CCSC has undertaken a reasonable assurance engagement in accordance with VCS Standard (version 4.7) /06/. It requires a reasonable level of assurance in verification that GHG assertions are free of material errors, omissions and misrepresentations. The verification conclusion is based on the VCS-joint PD&MR /03/, VCS-MR /01/, ER calculation spreadsheet /02/ and supporting evidences available to the verifier and information collected during the on-site inspection.

1.4 Summary Description of the Project

According to the VCS Program Guide (Version 4.4) /07/ and Annex A to the Kyoto Protocol, the project is applicable under the activity categories listed below:

Sectoral Scope 1: Energy (Renewable/Non-renewable)

Sectoral Scope 13: Waste handling and disposal

The project is not a grouped project.

The Project involves the construction and operation of the MSW Integrated treatment and electricity generation project at the Solid Resource Recycling Center, Fushan Village, Jiulong Town, Luogang District, Guangzhou City, Guangdong Province, P.R China. The Project can reduce GHG emissions by replacing the electricity generated by fossil fuel fired power plants of China South Power Grid (CSPG). The annual average amount of exported

electricity is estimated to 61,842 MWh in the three 7-year renewal crediting periods from 01-April-2020 to 31-March-2041. And the expected total emission reductions are 2,513,097 tCO₂e during the first crediting period, with average annual emission reductions 359,014 tCO₂e. This is the 3rd VCS monitoring period, the total verified carbon units (VCUs) achieved are 320,811 tCO₂e.

The summary of the project is shown in the following table.

Project title	Guangzhou Eastern Solid Resource Recycling Center MSW Integrated Treatment Plant Project
VCS ID	2746
Project Participants	Guangzhou LEO-KING Environmental Technology Co., Ltd. Climate Bridge (Shanghai) Ltd. (VCU Buyer, P. R. China)
Location of the project	The Solid Resource Recycling Center, Fushan Village, Jiulong Town, Luogang District, Guangzhou City, Guangdong Province, P.R China; East longitude 113°30'54" and North latitude 23°17'4"
Project start date	01-April-2020
Applied Methodology	ACM0022 Alternative waste treatment processes (Version 03.0)
Scope/Technical Area	Scope 01: energy industries (renewable-/non-renewable sources) Sectoral scope 13: Waste handling and disposal
VCS crediting period	01-April-2020 to 31-March-2027 (both days inclusive)
VCS monitoring period (3rd)	01-January-2023 to 31-December-2023 (both days inclusive)

2 VERIFICATION PROCESS

2.1 Method and Criteria

The overall verification, from Document Review to Verification Report & Opinion, was conducted using CCSC internal procedures.

A project specific verification plan was developed by the verification team to guide the verification auditing process to ensure efficiency and effectiveness.

The purpose of the verification is to present a risk assessment for determining the nature and extent of verification procedures necessary to ensure the risk of auditing error is reduced to a reasonable level. According to the ISO14064-3, the criteria are the policy, procedure or requirement used as reference against which evidence is compared.

The verification was performed through means of the following three phases in accordance with the requirement of the applied methodology, and the VCS Standard (version 4.7) /06/ and other relevant VCS requirements/07//08//09//10/.

- A desk review of the VCS MR /01/, ER calculation spreadsheet /02/ and all support documents;
- Follow-up interviews with project stakeholders and site inspection on 22-Oct-2024;
- The resolution of outstanding issues and the issuance of the verification report and statement.

CCSC completed a strategic review and risk assessment of the project's activities and processes in order to gain a full understanding of (if applicable):

- Project Details;
- Application of Methodology;
- Estimated GHG Emission Reduction and Removals;
- Monitoring;
- Safeguards etc.

CCSC also verified the emission reductions through assessing all factors and issues that constitute the basis for emission reductions from the project, including:

- The emission reduction calculations and the relevant data records;
- The calibration and maintenance records for the monitoring instruments;
- The management systems to support the project operation and monitoring.

CCSC assessed that the reported information in the MR is complete and accurate in question. This verification report describes the findings of this assessment. The information of the assessment team has been included in below of this report.

The following sections outline each step in more detail.

2.2 Document Review

A desk review of the VCS monitoring report (VCS-MR) /01/, the emission reduction calculation spreadsheet /02/, the VCS-joint PD&MR/03/, the Joint Validation and Verification Report /04/, the 2nd Verification Report /05/, the applied monitoring methodology /11/21//22//23//24//25//26//27/ was conducted by the verification team. In addition, relevant clarifications and guidance from the Verra, and other informational /supportive references relevant to the project were assessed.

The aim of the desk review of the documentation was to verify the completeness of the data and the information presented, to carry out the compliance check of the VCS-MR /01/ with respect to the monitoring plan and the applied methodology. Particular attention was given to the quality of the metering equipment including calibration requirements, the monitored data and its evidence, and the emission reduction calculation. The evaluation of data management, the quality assurance and quality control system in the context of their influence on the generation and reporting of emission reductions was also performed.

Appendix 3 of this report contains a complete list of all documents and proofs reviewed by the verification team.

2.3 Interviews

On 22-Oct-2024, CCSC performed an on-site assessment at the physical site of the project.

The verification team verified that the actual implementation of the project is consistent with that described in the VCS-MR /01/. This included the review of the project operation based on the evidence of on-site observation and presented documents.

During the on-site assessment, the verification team has interviewed with key personnel from the project participants, the local community and local government official.

The assessment content and topics, the persons interviewed at the on-site assessment were summarized in the following table.

Date: 22-Oct-2024	
Interview topics	Interviewed Organizations and persons
--The status of VCS project implementation. -- Any changes of the VCS project. -- The project on-site inspection -- The evidences of construction status and operation of key equipment, parameters monitoring and data processing activities, monitor equipment and calibration. -- Sustainable Development Contributions -- Environmental aspects -- Monitoring data. -- Quality Management; organizational structure, responsibilities and competencies; Internal QA/QC Management procedures and document control. --Compliance with National Laws and Regulations. -- Status and operation of Guangzhou Eastern Solid Resource Recycling Center	Guangzhou LEO-KING Environmental Technology Co., Ltd. Cao Yongjian, Chief Technical Officer Deng Shuhan, Operation Manager Beijing LEO-KING Environmental Technology Co., Ltd. Wang Ge, Carbon Accounting Manager
-- The impact of the project activity. --The stakeholder consultation during the operation of the project activity. -- The sustainable development contributions of the project	Local resident of Jiulong Town, Luogang District, Guangzhou City Xu Wen, Xingfeng Villager Zou Fuqiang, Fushan Villager Fan Diehuan, Fudong Villager Xu Lihua, Suifeng Villager Local Environment Protection Bureau He Bihai, Environmental Protection Bureau officer

Date: 22-Oct-2024	
Interview topics	Interviewed Organizations and persons
Preparation of Monitoring Report.	Climate Bridge (Shanghai) Ltd. Gu Jiayi, Project manager
Compliance of the monitoring plan with the monitoring methodology	
Compliance of monitoring with the monitoring plan	
Assessment of data and calculation of GHG emission reductions	

2.4 Site Visits

CCSC has applied standard auditing techniques to evaluate the quality of available information during the on-site assessment. The on-site assessment included different aspects of the project activity as listed below:

- An assessment of the implementation and operation of the project as per the VCS-joint PD &MR/03/;
- A review of information flows for generating, aggregating and reporting the monitoring parameters;
- Interviews with relevant personnel to confirm that the operational and data collection procedures are implemented in accordance with the approved monitoring plan;
- A cross-check between information provided in the VCS monitoring report /01/ and data from other sources such as operational records or similar data sources;
- A check of the monitoring equipment including calibration performance and observations of monitoring practices against the requirements of the VCS-joint PD&MR /03/ and the selected methodology /11//21//22/ /23//24//25//26//27/;
- A review of calculations and assumptions made in determining the GHG data and emission reductions;
- An identification of quality control and quality assurance procedures in place to prevent or identify and correct any errors or omissions in the reported monitoring parameters.

During the site inspection, the project location, main equipment, monitoring equipment and project implementation were inspected and document evidence were checked. The details of the site inspection flow are described in the table below.

Date	Activity performed	Locations	Team Member
22-Oct-2024	Management interview	Project-site Office	Wang Guan Wu Wei Wang Wenya
22-Oct-2024	Documents review	Project-site Office	Wang Guan Wang Wenya
22-Oct-2024	On-site inspection	East longitude 113°30'54" and North latitude 23°17'4"	Wang Guan Wu Wei
22-Oct-2024	Finding Summary	Project-site Office	Wang Guan Wu Wei Wang Wenya
22-Oct-2024	Close meeting	Project-site Office	Wang Guan Wu Wei Wang Wenya

2.5 Resolution of Findings

During the verification of a project activity, to identify issues that need to be further elaborated upon, researched or added to in order to confirm that the project meets the VERRA's requirements and can achieve credible emission reductions, the verification team will issue a Corrective Action Request (CAR), a Clarification Request (CL) or a Forward Action Request (FAR) depending on different situations.

The verification objective of this phase is to resolve issues related to the monitoring, implementation and operations of the registered project activity that could impair the capacity of the registered project activity to achieve emission reductions or influence the monitoring and reporting of emission reductions prior to CCSC's positive conclusion on the GHG emission reduction calculation.

Findings established during the verification can either be considered as a non-fulfilment of criteria ensuring the proper implementation of a project or where a risk to deliver high quality emission reductions is identified.

A Corrective Action Request (CAR) will be raised if one of the following occurs:

- a) Non-compliance with the monitoring plan or methodology are found in monitoring and reporting and has not been sufficiently documented by the project participants, or if the evidence provided to prove conformity is insufficient;
- b) Modifications to the implementation, operation and monitoring of the registered project activity has not been sufficiently documented by the project participants;
- c) Mistakes have been made in applying assumptions, data or calculations of emission reductions that will impact the quantity of emission reductions;
- d) Issues identified in a FAR during validation to be verified during verification or previous verification(s) have not been resolved by the project participants.

A Clarification Request (CL) will be raised if information is insufficient or not clear enough to determine whether the applicable VCS requirements have been met.

A Forward Action Request (FAR) will be raised for actions if the monitoring and reporting require attention and/or adjustment for the next verification period.

There are 2 CLs and 1 CAR raised by CCSC during the current verification. And communications were made between the Client and CCSC to guarantee the transparency of the verification process, the CLs and CAR have been satisfactorily addressed by the project proponents in the MR (Version 2.1) dated 19-February-2025/01/, the concerns raised, and responses given are summarized below in the appendix 4.

The CL-1 has been raised is that “The survey questionnaires collected from local stakeholders are not provided”, PP provided 30 survey questionnaires collected on 2023 from local stakeholders as evidence.

The CL-2 has been raised is that “The record about the operation time of the generators and the flare are not provided.”, PP provided the record about the operation time of the generators and the flare in this monitoring period and the maintenance records of equipment as evidence.

The CAR-1 has been raised is that “Based on the on-site inspection, PP has purchased biogas for power generation in this monitoring period. Please supplement the corresponding description and calculation in the MR, and provide the evidences and Calibration Certificate of the flow meter used to monitor the amount of purchased biogas

meanwhile. The Serial No of the flow meter in the MR was not match with that on the nameplate installed at inlet of the flare verified on site. It is recommended to correct the information of flow meter in the MR.”, PP provided the Biogas Purchase Contracts and biogas purchase record, and takes conservative method to re-calculate the emission reductions to ensure not to over estimate the emission reductions. PP also supplemented the corresponding description and calculation in the revised MR version 2.1 and ER calculation spreadsheet version 2.1. In the revised MR, PP made a project description deviation and analyzed that the deviation will not change or influence the applicability of methodology, additionality or the baseline scenario of the project. PP supplemented the revised IRR calculation spreadsheet considering the biogas purchase. Additionally, PP explained that the old flow meter used for monitoring the volumetric flow of the biogas has been changed by a new one for a better accuracy on 07-Dec-2023, that information has been added to the revised MR version 2.1 and the calibration certificate that can match with the nameplate for the flow meter has been provided.

The CLs and CAR above have been closed satisfactorily.

2.5.1 Forward Action Requests

No Forward Action Requests were raised during the current verification.

2.6 Eligibility for Validation Activities

The VVB “China Classification Society Certification Co. Ltd.” commissioned by the project participant is one of the eligible VVBs listed on the VERRA website (<https://verra.org/validation-verification/>), and it holds the accreditation for validation and verification for the sectoral scope: “1. Energy (renewable/non-renewable)” and “13: Waste handling and disposal”, to which the project belongs. Therefore, CCSC is eligible for the validation/verification of the project.

3 VALIDATION FINDINGS

3.1 Methodology Deviations

No deviation from the methodology needs to be submitted for this monitoring period.

3.2 Project Description Deviations

During the 2nd monitoring period, the project description deviation about the total installed capacity has been reviewed and approved by VERRA on 27-August-2024. In the Joint PD&MR (Version 2.1)/03/, the total installed capacity will be 10.34 MW included 4 generators with each 1.063 MW and 2 generators with each 3.044 MW, which is based on the data of Electricity Purchase Contract. According the nameplate of the generators during the on-site inspection, the total installed capacity is 10.45 MW included 4 generators with each 1.053 MW and 2 generators with each 3.119 MW in this monitoring period. The gas generators model and rated capacity in the MR(Version 2.1) /01/ were same to the actual nameplate.

During this monitoring period, the project description deviation about the purchase of surplus biogas from a fresh waste anaerobic digestion project for power generation has been made.

According to the registered Joint PD&MR (Version 2.1)/03/, the project treats MSW with anaerobic digesters and utilizes recovered biogas for electricity generation. The source of biogas is from the MSW treatment process. But Via the on-site inspection and interviewing with project owner during this verification process, the verification team found that PP has purchased biogas for power generation in this monitoring period.

By checking the Biogas Purchase Contracts and Biogas purchase Record/43/ and on-site inspection, it was confirmed that PP purchased surplus biogas since January 2023 for power generation from a fresh waste anaerobic digestion project (started operation in 2022, later than the operation start date of the project) owned by Grandtop Fushan Environmental Protection Energy Co., Ltd. A new pipeline with a biogas flow meter has been built connecting the project activity with the Grandtop Fushan project. The purchased biogas is measured by the newly installed flow meter and then fed to the pre-treatment system of the project site. The quantity of biogas purchased from Grandtop Fushan Environmental Protection Energy Co., Ltd. is 934071 m³ covering this monitoring period from 01-January-2023 to 31-December-2023 with both days included. This change leads to the project deviation from registered Joint PD&MR (Version 2.1)/03/.

PP had analyzed the deviation impacts to the applicability of the methodology, additionality or the appropriateness of the baseline scenario in the section 3.2.2 of MR (Version 2.1) /01/, and the verification team had checked that the analysis of impacts to the applicability of the methodology, additionality or the appropriateness of the baseline scenario by the project deviation is justified, as follows:

Type	The applied methodology ACM0022 and registered joint PD&MR (Version 2.1)	Justification of the project deviation
Applicability of applied methodology	The methodology applies to project activities that install and operate new plants for the treatment of fresh waste through any combination of the following processes: (a) Composting process under aerobic conditions; (b) Anaerobic digestion with biogas recovery and flaring and/or its use; (c) Co-composting of wastewater in combination with solid waste; (d) Anaerobic co-treatment of wastewater in combination with solid waste; (e) Mechanical/thermal treatment process to produce refuse-derived fuel (RDF) or stabilized biomass (SB) that is produced within the project boundary and its use; (f) Gasification process to produce syngas and its use; (g) Incineration of fresh	By checking the joint PD&MR (Version 2.1, 2.2) /03/, MR (Version 2.1) /01/, FSR /39/ and through on-site visit, the verification team confirmed that the project activity utilizes the biogas from anaerobic digestion of fresh waste for power generation. The project deviation does not change the facts and conditions prior to the project implementation. Therefore, the project is still applicable to (b). All other processes, i.e. (a), (c), (d), (e), (f), (g), are irrelevant to the project activity. According to condition (h), condition (i) to (n) applies to all project activities using this methodology: (i) The project plant only treats fresh waste/wastewater for which emission reductions are claimed, except for cases involving composting, co-composting and anaerobic digestion; By checking the joint PD&MR (Version 2.1, 2.2) /03/, MR (Version 2.1) /01/, FSR /39/ and through on-site visit, the verification team confirmed that the project activity utilizes fresh waste for anaerobic digestion, only emission reductions from treatment of fresh

	waste for the generation of thermal/electric energy. (h) The following conditions apply to all project activities using this methodology: (i) The project plant only treats fresh waste/wastewater for which emission reductions are claimed, except for cases involving composting, co-composting and anaerobic digestion; (j) Neither the fresh waste nor the products from the project plant are stored on-site under anaerobic conditions; (k) Any wastewater discharge resulting from the project activity is treated in accordance with applicable regulations; (l) The project activity does not reduce the amount of waste that would be recycled in the absence of the project activity. This shall be justified and documented in the clean development mechanism project design document (CDM-PDD); (m) When applicable regulations mandate any waste treatment process implemented under the project activity, the rate of compliance with such regulations for the treatment process is below 50 per cent ;	waste are claimed, emission reductions from biodiesel waste heat recovery and production system are not claimed. Therefore, condition (i) is still applicable. (j) Neither the fresh waste nor the products from the project plant are stored on-site under anaerobic conditions; By checking the joint PD&MR (Version 2.1, 2.2) /03/, MR (Version 2.1) /01/, FSR /39/ and through on-site visit, the verification team confirmed that the Fresh waste is pre-treated and fed to the anaerobic digester immediately after being transported to the project site and the digestate from the anaerobic digester is transported and incinerated directly by the nearby MSW incineration plant. Both fresh waste and digestate are not stored onsite under anaerobic conditions. Furthermore, no fresh wastes and digestate were identified through on site inspection. Therefore, condition (j) is still applicable. (k) Any wastewater discharge resulting from the project activity is treated in accordance with applicable regulations; By checking the joint PD&MR (Version 2.1, 2.2) /03/, MR (Version 2.1) /01/, EIA approval /41/ and through on-site visit, the verification team confirmed that the wastewater produced by the project is treated aerobically by wastewater treatment plant in accordance with applicable
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	(n) Hazardous wastes/ wastewater are not eligible under this methodology.	regulations. Therefore, condition (k) is still applicable. (l) The project activity does not reduce the amount of waste that would be recycled in the absence of the project activity. This shall be justified and documented in the clean development mechanism project design document (CDM-PDD); By checking the joint PD&MR (Version 2.1, 2.2) /03/, MR (Version 2.1) /01/, FSR /39/ and interview PP and stakeholder through on-site visit, the verification team confirmed that prior to the implementation of the project, the fresh waste was disposed of at nearby landfill with a partial LFG capture system. The project does not reduce the amount of waste that would be recycled in the absence of the project activity. Therefore, condition (i) is still applicable. (m) When applicable regulations mandate any waste treatment process implemented under the project activity, the rate of compliance with such regulations for the treatment process is below 50 per cent ; By checking the public information, the verification team confirmed that there is no applicable laws or regulations in China that require anaerobic digestion of fresh waste up to date. Therefore, condition (m) is still applicable. (n) Hazardous wastes/wastewater are not eligible under this methodology.
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		By checking the joint PD&MR (Version 2.1, 2.2) /03/, MR (Version 2.1) /01/, FSR /39/ and through on-site visit, the verification team confirmed that the fresh waste utilized by the project activity is municipal solid waste (MSW), not treat hazardous wastes or wastewater. Therefore, condition (n) is still applicable.
	The methodology is only applicable if the baseline scenario is: (a) The disposal of the fresh waste in a SWDS with or without a partial LFG capture system (M2 or M3); (b) In the case of co-composting or co-treatment of wastewater in an anaerobic digester, the treatment of organic wastewater in either an existing or new anaerobic lagoon or sludge pit without methane recovery (W1 or W4); (c) In the case of electricity generation, the electricity is generated in an existing/new captive fossil fuel fired power-only plant, captive cogeneration plant and/or the grid (P2, P4 or P6); (d) In the case of heat generation, the heat is generated in an existing/new fossil fuel fired cogeneration plant, boiler or air heater (H2 or H4).	By checking the joint PD&MR (Version 2.1, 2.2) /03/, MR (Version 2.1) /01/, FSR /39/ and through on-site visit, the verification team confirmed that the project deviation does not change the facts and conditions prior to the project implementation, the project is applicable to (a) and (c). The baseline scenario identified for the project is: the fresh waste was disposed at nearby landfill with a partial capture of the LFG and flaring of the captured LFG (M2); The electricity generated by the project is supplied to China South Power Grid (CSPG) which is dominated by coal-fired power stations (P6). Therefore, criteria (a) and (c) are still applicable.

	Specific applicability conditions for the different processes are provided in Table 2 of ACM0022 (Version 03.0).	By checking the joint PD&MR (Version 2.1, 2.2) /03/, MR (Version 2.1) /01/, FSR /39/ and through on-site visit, the verification team confirmed that the project deviation does not change the facts and conditions prior to the project implementation; The project utilizes the biogas from anaerobic digestion of fresh waste for power generation. By checking the Summary Table of quantity and fraction of treated fresh waste covering this monitoring period/18/, Statistic of production data covering this monitoring period/17/, it is confirmed that the fresh waste of the project is mainly kitchen and catering waste from Guangzhou City. The production of this project is biodiesel and electricity, there are no non-biodegradable materials of waste by-products that may have market value. Thus, the project is applicable to the option “Anaerobic digestion” of the column “waste treatment option under the project activity” listed in Table 2 of ACM0022 (version 03.0). Therefore, the criteria is still applicable.
Additionality	As per the registered VCS-JPM, the project activity has a project IRR of 7.87%, lower than the benchmark IRR of 12%	By checking the IRR calculation spreadsheet/42/, the revised joint PD&MR (Version 2.2)/03/, biogas purchase agreement /43/, FSR and all other related documents, it is confirmed that, since January 2023, a new pipeline with a biogas flow meter has been built by PP which connecting the project activity with the Grandtop

Fushan project to purchase surplus biogas for power generation. The project deviation will affect the investment analysis and the additionality.

PP has considered the change in the total static Investment – Cash outflow, Annual O&M cost – Cash outflow, Annual revenue from electricity generation (excluding VAT) – Cash inflow, Expected annual biogas purchased, Expected annual electricity exported and revised the investment analysis in the IRR calculation spreadsheet/42/, the revised joint PD&MR (Version 2.2)/03/. The re-calculated project IRR has added the additional sales revenue 2,725,901CNY from the expected electricity 4,628.89MWh generated from the purchased biogas (2,000,000Nm³ with a CH₄ content of 55%) to the cash inflow, and adding the cost 580,000CNY for biogas purchase(2,000,000Nm³ with the price of 0.29 CNY/Nm³) to the cash outflow. The additional project cost due to construction of biogas pipeline and other costs (such as incremental maintenance cost) is not considered in this IRR re-calculation, which is deemed conservative.

Based on the above analysis, the project IRR was updated from 7.87% to 8.17%, which is still below the benchmark of 12%.

Furthermore, the sensitivity analysis for the updated project IRR shows that

		the project IRR fluctuates between 6.47% and 9.77%. The updated investment analysis shows that the project is still not financially attractive. Thus, the project deviation has no impact on the additionality.
Baseline Scenario	The baseline scenario identified for the project is: the fresh waste was disposed at nearby landfill with a partial capture of the LFG and flaring of the captured LFG (M2); The electricity generated by the project is supplied to China South Power Grid (CSPG) which is dominated by coal-fired power stations (P6)	By checking the joint PD&MR (Version 2.1, 2.2) /03/, MR (Version 2.1) /01/, FSR /39/ and through on-site visit, the verification team confirmed that the project deviation does not change the facts and conditions prior to the project implementation; therefore, the baseline scenario of the project activity remains still.

Based on the analysis above, the verification team confirmed that the deviation does not impact the applicability of the methodology, additionality or the appropriateness of the baseline scenario. Since the deviation leads to a change in the project investment analysis, in accordance with para 3.21.2 (1) of the VCS Standard v4.7, PP had updated the description the project deviation in the section 3.5 of the joint PD&MR (Version 2.2 dated 19-Feb-2025) /03/ to justify this deviation.

By checking the registered joint PD&MR (Version 2.1) /03/, MR (Version 2.1) /01/, ER calculation spreadsheet/02/, it is confirmed that, to ensure the ER of the project is not overestimated, the electricity generated from purchased biogas ($EC_{\text{purchased},y}$) had been deducted by PP for the calculation of baseline emissions associated with energy generation ($BE_{EC,y}$) for conservativeness. In addition, all purchased biogas is considered as flared biogas and corresponding project emissions from combustion of purchased biogas are calculated. Although all purchased biogas is used for electricity generation by the project and the associated project emissions from combustion of purchased biogas is considered 0 as per the applied methodology.

Due to the fact that the electricity generated from purchased biogas cannot be monitored separately from the biogas generated by the anaerobic digestors of the project as the purchased biogas share the same pre-treatment system, biogas pipeline and biogas generators with the biogas generated by the project, the electricity generated from purchased biogas ($EC_{\text{purchased},y}$) is calculated theoretically assuming the biogas generators

By checking the MR(Version 2.1) /01/, ER calculation spreadsheet/02/, Calibration Certificate of flow meter/19/ and through on-site visit, it is confirmed that PP had monitored the quantity of purchased biogas ($V_{\text{purchased},y}$) continuous by newly installed biogas flow meter (Serial No.: 2207L4628001), but not install gas analyzer to monitor the volumetric fraction of CH_4 in the purchased biogas, it is conservatively assumed that the CH_4 content in the purchased biogas is 100%, since the value of purchased biogas is deducted from total ER and higher value of $V_{\text{purchased},y}$ will result in lower ER of the project.

[illegible]

It has been assessed by CCSC that the project descriptions deviations about the purchase of surplus biogas from a fresh waste anaerobic digestion project for power generation above do not affect the methodology applied, the additionality and the appropriateness of the baseline scenario are not affected, the calculation of GHG emission reductions will increase because of the electricity generated from the purchased biogas generated by the

Grandtop Fushan project, but the ER calculation is conservatively calculated and has not overestimated. Therefore, the project remains in conformance with the VCS rules.

3.3 New Project Activity Instances in Grouped Projects

The project is not a grouped project, hence this clause is not applicable.

3.4 Baseline Reassessment

Did the project undergo baseline reassessment during the monitoring period?

☐ Yes

☒ No

4 VERIFICATION FINDINGS

4.1 Project Details

Item	Evidence gathering activities, evidence checked, and assessment conclusion:
Audit history	Through checking the registered joint PD&MR/03/, the joint validation and verification report/04/ and the verification report/05/, it was validated that the project has been registered as a VCS project with VCS ID 2746. Via checking the information on the VERRA website https://registry.verra.org/app/projectDetail/VCS/2746, the audit history mentioned in the MR/01/ has been confirmed correct.
Double counting and participation under other GHG programs	Through reviewing the registered joint PD&MR/03/, the joint validation and verification report/04/, it was confirmed the project has been registered as a VCS project with Project ID. 2746, which is available at the website of https://registry.verra.org/app/projectDetail/VCS/2746. By checking public information on the website of UNFCCC, GS, CDM, GCC, CCER, and interviewing with project owner, it was confirmed that the project is not registered or seeking registration under any other GHG programs, or rejected by another GHG program. No Double Counting statement/34/ signed by the PP also certified the project would claim only for VCUs during this monitoring period from 01-January-2023 to 31-December-2023. Therefore, it is confirmed that the project is eligible to participate under the VCS Program as there is no double counting for the emission reduction.
No double claiming with emissions trading programs or binding emission limits	Since China has initiated ETS in July 2021, and As per the Notice (Huan ban qi hou [2021] No.9) issued by Ministry of Ecology and Environment of P.R.China (MEE), there are 7+1 Pilot ETSs in China, which include Beijing city, Shanghai city, Tianjin city, Chongqing city, Shenzhen city, Guangdong province, Hubei province and Fujian province. The national emissions trading scheme in China only cover the high-emission industries just

	now, such as power generation sector that emitted at least 26,000 tons of CO₂e/year which has been verified in the public website. The project owner and the project activity is not included the mandatory emission control scheme and there is no emission cap enforced for the project owner by checking the enforced company list in public information. Hence, it is confirmed that the emission reductions will not be double counted. The verification team also checked the relevant laws, statutes, and other regulatory, and found that the allowance (CEA) for power generation industries will be allocated on the basis of carbon emission intensity, i.e. the CEA allocation is not related with the components of local grid. The No Double Counting statement/34/ issued by the project owner confirmed that the Net GHG emission reductions or removals generated by the project will not be used for compliance with an emissions trading program or to meet binding limits on GHG emissions in any Emission Trading program or other binding limits. In summary, the verification team concluded that, the project activity will not be involved on other Emissions trading programs and other binding limits, no double claiming with emissions trading programs or binding emission limits against VCS Standard requirements.
No double claiming with other forms of environmental credit	The project has not sought, received or planned to receive any other form of environmental credit or has become eligible to do so since the validation or previous verification under the VCS Program. By checking the information on I-REC website and REC Mechanism database of China, it is confirmed that the project does not apply for I-REC or REC of China. The same has been verified through checking the No Double Counting statement/34/ issued by the project owner. Therefore, the verification team can confirm no double claiming with other forms of environmental credit.
Supply chain (scope 3) emissions double claiming	By checking the MR/01/, Supply chain (scope 3) emissions no double claiming/44/ and interview PP and stakeholder through on-site visit, the verification team confirm that the project aims to capture and utilize landfill gas for power generation, the product

	of the project is the net electricity export to local power grid company, without the project, the landfill gas would be vented into the atmosphere directly and the electricity would be supplied by China South Power Grid (CSPG) which is dominated by coal-fired power stations. The project only sells electricity to local power grid company, not the environmental rights associated with the feed-in tariff. And the project does not provide precursors to other organizations to produce products. In summary, CCSC verification team can confirm that the project doesn't affect the emissions footprint of any product(s) (goods or services) that are part of a supply chain.
Sustainable development contributions	By checking China's National Plan on Implementation of the 2030 Agenda for Sustainable Development and 17 SDGs defined by UNDP, the joint PD&MR/03/, the joint validation and verification report/04/ and the verification report/05/, Employee roster, labour contracts and Payroll statement/30/, Electricity invoices and Power Settlement Statement for electricity export/14/ and interviewing with the project owner, the verification team can confirm that the project activity has contributed to sustainable development goals in the region as follows: SDG 7.2: By 2030, increase substantially the share of renewable energy in the global energy mix: the project utilizes LFG for renewable power generation and accordingly substitute equivalent electricity from thermal power, which contributes to achieve China's stated sustainable development priorities. The project has provided 10,625.281 MWh renewable energy during this monitoring period and 66,578.881 MWh from 01-April-2020 onwards. SDG 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: The project provides long-term employment positions for local villagers and increase tax revenue, which has a positive effect on the local economy. 258 employees have been provided with job opportunities and received stable payments during this monitoring period, and 308 employment positions have been provided for local villagers from 01-April-2020 onwards. SDG 13.2: Integrate climate change measures into national

	policies, strategies and planning : the project is to utilize the LFG for electricity generation to avoid methane emissions and CO₂ emissions, and equivalent amount of electricity generation by the project that would otherwise have been purchased from the CSPG, which contributes to achieve China's stated sustainable development priorities. The project has avoided a GHG emission reduction of 320,811 tCO₂e during this monitoring period and 965,818tCO₂e from 01-April-2020 onwards.
Additional information relevant to the project	No commercially sensitive information has been excluded from the public version of the PD or MR. The details are presented transparently to the verification team for analysis which lead to positive conclusion for this verification.

4.2 Safeguards and Stakeholder Engagement

4.2.1 Stakeholder Identification

Item	Evidence gathering activities, evidence checked, and assessment conclusion
Stakeholder identification	The verification team has checked the joint PD&MR/03/ and the MR/01/ and confirm that the stakeholders identification has been conducted as per the VCS standard Version 4.7 /06/. The stakeholder involved in the project has been correctly identified in the MR/01/ and in line with the same in the joint PD&MR/03/. The project owner engaged in a stakeholder mapping exercise, identifying individuals and organizations with a vested interest or potential influence over the project. Interviews and surveys were conducted with residents, businesses, and subject matter experts to gather various perspectives. People or groups who might be impacted by the project include the residents of the nearby village, staff of the project and relevant administrative staff of the local government such as environmental watchdogs, energy regulators, and local government officials. In addition, the project owner reviewed regulatory standards and consulted with government entities to ensure compliance and to identify any legal stakeholders. Via interviewing stakeholders during site visit, it was verified survey questionnaires were distributed to relevant personnel of

	the project Staff, nearby villagers, and government officials by the Project owner to invite Local stakeholders. The verification team considers the stakeholder identification of the project activity as reasonable.
Legal or customary tenure/access rights	By checking the joint PD&MR/03/, MR/01/, Project Approval /40/ and EIA approval /41/, interviewing stakeholders and PP during site visit, it is confirmed the project activity has been approved by local government, the project activities do not involve alterations to the existing legal or customary tenure/access rights of stakeholders, indigenous people (Ips), local communities (LCs), or customary rights holders, and the land is already designated for industrial purposes before the project construction. Therefore, it was verified the project activity does not violate any legal or customary tenure/access rights to territories and resources, including collective and conflicting rights, held by stakeholders, indigenous people (IPs), local communities (LCs), and customary rights holders.
Stakeholder diversity and changes over time	By checking the joint PD&MR/03/, MR/01/, survey questionnaires/29/ and interviewing stakeholders during site visit, it is confirmed there are no change for the project since the validation, the project is implemented as the design mentioned in the joint PD&MR/03/. The stakeholder diversity and changes over time in the aspects including culture, society, economy, and etc. has been checked and confirmed by the audit team by onsite interview and with expertise of the verification team. The structure of stakeholder composition does not change since validation. The number of male is slightly higher than the female. Age of people mostly locates in the range of 24-45 years old. Source of income of plant staff is the salary paid by the project owner. Occupations of the villagers are workers, farmers, self-employed and waiters. Source of income of famers is agricultural activity and the others are paid by the bodies they serve. As for the government officials, their income is the salary paid by the government. The cultural background of stakeholder is homogeneous. The ethnic group of respondents is Han. The project provides opportunities to local villagers to be project staff. The staff are responsible for project operation. Government officials play a role of supervising and

	mediating grievance. The project did not and would not bring negative environmental impacts like water pollution, noise, or air pollution. Nearby villagers and plant staff can report to government officials when they find the project negatively impact their life. There is no change in the make-up of each group during this monitoring period. Person mobility is not strong surrounding the project area. Therefore, the verification team considers the stakeholder diversity and changes over time is highly unlikely.
Expected changes in well-being	Through the site visit, the verification team can confirm the project improve local environment, increase clean electricity supply, offers job opportunities and contributes to improve the well-being of local communities, which has been described in the registered joint PD&MR/03/ and the MR/01/.
Location of stakeholders	By checking registered joint PD&MR/03/, MR/01/, and interviewing stakeholders during site visit, the verification team can confirm that the location of stakeholders are within the factories, nearby villages and local government near the project site. The project does not involve indigenous peoples, customary rights holders, and areas outside the project area that are predicted to be impacted by the project.
Location of resources	By checking registered joint PD&MR/03/, MR/01/, and interviewing stakeholders during site visit, it is confirmed the project activity has been approved by local government. Therefore, verification team confirmed no territories accessed by the project was owned or customarily accessed by the stakeholders, and no identified stakeholders own or have customary access to the territories and resources occupied by the project.

4.2.2 Stakeholder Consultation and Ongoing Communication

Item	Evidence gathering activities, evidence checked, and assessment conclusion
Ongoing consultation	By checking registered joint PD&MR/03/, MR/01/, survey questionnaires /29/ and interviewing stakeholders during site visit, it is confirmed that in this monitoring period, the project owner sets up an ongoing communication mechanism by holding

	stakeholder meetings, distributing questionnaires, or communicating with stakeholders by phone or other means once a year to collect the opinions of local stakeholders during the project operation period, the project owner. Therefore, verification team confirmed project owner had set up on-going consultation mechanism.
Date(s) of stakeholder consultation	By checking survey questionnaires /29/, the verification team confirmed that in this monitoring period, the project owner carried out questionnaire survey for the local stakeholders on 26-Dec-2023.
Communication of monitored results	By checking MR/01/, survey questionnaires /29/ and interviewing stakeholders during site visit, it is confirmed that the project owner set up an on-going communication mechanism with Local stakeholders at periodic intervals. Key implementation schedules or changes of the project were communicated to the local authority, who informed the neighborhood committee and the local residents, the comments and suggestions from residents were collected by the local authority meanwhile. Regarding environmental impact or safety issues, the relevant responsible personnel would be promptly notified for inspection and corrective action upon receiving the feedback, and an immediate report would be submitted to the company management. Besides, via interviewing with staff from local environmental protection bureau during the site visit, it is confirmed by the verification team that during the implementation stage of this monitoring period, there were no negative comments or issues from the local stakeholders during this monitoring period.
Consultation records	By checking the survey questionnaires /29/ and interviewing stakeholders during site visit, it was verified 30 questionnaires have been filled out on 26-Dec-2023, and the survey results were recollected. No negative comments have been raised in the surveys. Paper questionnaires would be retained within the whole crediting period.
Stakeholder input	By checking survey questionnaires /29/, and interviewing stakeholders during the site visit, it is confirmed that there were no negative comments received during the project operation in this monitoring period. Stakeholders generally reflect that the project did not bring any costs but bring benefits to them. And

stakeholders know about basic laws and regulations about labor right.

4.2.3 Free, Prior, and Informed Consent

Item	Evidence gathering activities, evidence checked, and assessment conclusion
Consent	By checking the survey questionnaires /29/, Notice in advance of the 3rd verification/45/, and interviewing stakeholders during site visit, it is confirmed the project owner has put up a notice on the wall of the project before implementing the 3rd verification to disclose the information since 01-Dec-2023. The information disclosed to all the stakeholders include the purpose of the project, duration of the monitoring period, project's present capacity and implementation status, a preliminary assessment of the likely economic, social, cultural and environmental impact, personnel to be involved in the verification (stakeholders, consultant, verifying body) and contact details of the project proponent. The project activity does not violate any legal rights held by stakeholders, indigenous people (IPs), local communities (LCs), and customary rights holders, and all the stakeholders were free, prior, and Informed Consent. Thus there is no negative comments received during this monitoring period.
Outcome of FPIC discussion	By interviewing stakeholders during site visit, it was verified the notice about the project information disclose was open to all identified stakeholders, and there were no ongoing or unsolved conflicts. The project does not involve IPs or customary right holders. Stakeholders participate the questionnaire survey held on 26-Dec-2023 as a result of the FPIC.

4.2.4 Grievance Redress Procedure

Item	Evidence gathering activities, evidence checked, and assessment conclusion
Grievance received and steps taken to resolve the grievance	No grievance and negative comments have been received for the project during the monitoring period.

including the outcomes of the resolution	As justified in 4.2.2 section of this report, the project owner establishes a complete grievance redress procedure, including on-site postings for receiving, phone contact for hearing, responding to the grievance in a week and attempting to resolve grievances within a month. These ways can be easily accessible to stakeholders for on-going consultation. By interviewing stakeholders during site visit, it is confirmed key implementation schedules or changes of the project would be communicated to the local authority, the neighbourhood committee and the local residents, and the comments and suggestions from residents will be collected. PP and stakeholders would discuss the solution in a week. If agreement could not be reached, the local government would be invited to solve the problem. The grievance procedure is well-documented and easily accessible to stakeholders through the on-site postings. Regular stakeholder meetings and multiple feedback channels ensure stakeholders are aware of and can easily access the grievance process.
Grievance redress procedure	Not applicable as no grievances have been received for the project during the monitoring period.

4.2.5 Public Comments

Comments received	Actions taken by the project proponent	Evidence gathering activities, evidence checked, and assessment conclusion
No comment has been received	Not applicable as no comments received.	Not applicable as no comments received.

4.2.6 Risks to Local Stakeholders and the Environment

4.2.6.1 Management Experience

By checking the registered joint PD&MR/03/, MR/01/ and interviewing PP during site visit, it is confirmed that the project owner Guangzhou LEO-KING Environmental Technology Co., Ltd. delegated the project to Climate Bridge (Shanghai) Ltd. for VCS project development. Climate Bridge (Shanghai) Ltd. have developed over 100 Clean Development Mechanism (CDM) projects and over 100 Verified Carbon Standard (VCS) projects and Gold Standard (GS) projects.

Via interviewing the project manager of Climate Bridge (Shanghai) Ltd and checking the website¹ (<https://en.climatebridge.com>) , it is confirmed that Climate Bridge (Shanghai) Ltd. has extensive experience in carbon emission reduction projects' development, and its management team have expertise or experience to support the project, which will fill the gaps of the project owner Guangzhou LEO-KING Environmental Technology Co. in expertise.

4.2.6.2 Risk Assessment

Item	Evidence gathering activities, evidence checked, and assessment conclusion
Natural and human induced risks to stakeholders' wellbeing	By checking the registered joint PD&MR/03/, MR/01/, survey questionnaires /29/ and interviewing stakeholders and PP during site visit, it is confirmed that the project aims to reduce the methane emissions and generate clean power for the local residents. Compared with the baseline scenario, there is no risk from neither natural nor human-induced risks are identified, almost all the stakeholders are supportive to the project operation, believing that the project benefits local economic development, and increase local power supply. Therefore, it was confirmed that there is no Natural and human induced risks to stakeholders' wellbeing.
Risks to stakeholder participation	By checking the registered joint PD&MR/03/, MR/01/, the survey questionnaires /29/ and interviewing stakeholders during site visit, it is confirmed that project owner had set up on-going communication mechanism with local stakeholders, and there were no negative comments received during the project operation. Therefore, it was verified no risks has been identified to stakeholder participation.
Working conditions	By checking the registered joint PD&MR/03/, MR /01/, Project Approval /40/ and EIA approval /41/, it is confirmed the project has been approved by Chinese government, in this sense, the project meets all the requirement of regulation and laws set up by Chinese government in aspect of environment, health and safety. The EIA report assesses gas leakage hazards and fire hazards. To prevent these hazards, relevant facilities are installed according to corresponding standard. The distance between gas transmission pipeline and other buildings meets the fire protection code for

¹ <https://en.climatebridge.com/>

	building design (GB50016-2014). Via on-site visit, it is confirmed that the project provides safety training and adequate labor protection supplies for employees, requirements for working conditions have been described in the project design and management manual. There are more than one exists at the production workshop, equipped with fire extinguishing appliances, and fireworks are strictly prohibited in the workshop. The project owner implemented safety production investment, eliminated safety hazards in time, the project provides safety training and adequate labor protection supplies for employees. Therefore, the verification team deemed the staff from the project are working in safety working environment, and no risks identified for working conditions.
Safety of women and girls	In order to protect the physical and mental health of minors, China published " Law of the People's Republic of China on the Protection of Women's Rights and Interests", "Labor Contract Law of the People's Republic of China" and "Special Provisions on Labor Protection for Women Workers". Article 12 of Labour Law of the People's Republic of China enforces: Labourers, regardless of their ethnic group, race, sex, or religious belief, shall not be discriminated against in employment. By checking the Employee roster, labour contracts and Payroll statement/30/, MR/01/, and interviewing stakeholders, it was verified women and girls were not exposed to further risks or hazards. The project pays attention to the occupational health of female employees, providing regular health checkups and mental health support. Women and girls had been recruited with equal payment to men, the pay structure is reviewed regularly to ensure fair pay for both male and female employees. The project proponent obeys the anti-discrimination rules set out in the law and the HR Handbook constrains the human resource practice. Therefore, it is confirmed no risks has been exposed to safety of women and girls in the local community due to project activities.
Safety of minority and marginalized groups, including children	Via interviewing stakeholders and PP, it is confirmed that the special needs of children, minorities and marginalized groups are fully taken into account to ensure the inclusiveness of project facilities and services at the project design and planning stage. Effective feedback mechanism was established by PP to ensure

	that community members can give feedback on their opinions and problems at any time. Besides, Article 12 of Labour Law of the People ' s Republic of China enforces: Labourers, regardless of their ethnic group, race, sex, or religious belief, shall not be discriminated against in employment. And article 15 enforces: The employing units are prohibited from recruiting minors under the age of 16. The project owner strictly obeys the law and the HR Handbook constrains the human resource practice. Therefore, it is confirmed no risks has been exposed to of minority and marginalized groups, including children.
Pollutants (air, noise, discharges to water, generation and release of hazardous materials and chemical pesticides and fertilizers)	Via checking the EIA approval /41/ approved by Guangzhou environmental protection bureau on 02-May-2017 and the EIA summary and conclusion provided in the registered joint PD&MR/03/, it is confirmed that the impact caused by LFG power generation on the surrounding ecosystem and residents, air, water, noise and solid waste is very limited, and measures have been identified in the EIA of the project to mitigate environmental pollution caused by construction and operation, which were implemented per environment pollution-related laws and regulations. Through interviewing stakeholders of local government, it is confirmed that the project was implemented as per environment pollution related laws and regulations and supervised by the local government, wastewater, solid wastes, noise and air pollutants are emitted strictly under the limits of relevant regulations and standard. Thus, no risks has been identified about pollutants during the monitoring period.

4.2.7 Respect for Human Rights and Equity

4.2.7.1 Labor and Work

Item	Evidence gathering activities, evidence checked, and assessment conclusion
Discrimination	By checking Employee roster, labour contracts and Payroll statement /30/ and interviewing stakeholders, it is confirmed women have been employed during construction and operation period, the project owner strictly obeys the labor law. There was

	no discrimination during the monitoring period.
Sexual harassment	Via interviewing stakeholders and PP, it is confirmed that the project owner strictly obeys the labor law and set up a reporting and handling mechanism to prevent sexual harassment of female employees. Anyone could report anonymously to the project proponent whenever they experience or witness such an event. The project proponent will verify the situation and handle it in compliance with laws and regulations. There was no sexual harassment occurred during the monitoring period.
Gender equity in labor and work	By checking Employee roster, labour contracts and Payroll statement /30/ and interviewing stakeholders, it was verified the project neither increase women's workload nor prevent them from engaging in other activities. The Project has equal opportunity for women and men to contribute both in volunteer and working positions and provides the same salary to male and female employees at the same position, both male and female employees enjoy the same perks and benefits, training opportunities and promotion opportunities. Besides, China also ratified relevant ILO core conventions on equality, namely Equal Remuneration Convention (Convention No 100). Therefore, it is confirmed equal opportunities have been provided by the project activity in the context of gender equity and pay for labor and work.
Forced labor	Forced labor is an illegal activity in the host country and the local labor compliance takes into account of the same. Further, China is a party to ILO and forced labour is illegal in China. China has relevant laws and regulations in place prohibiting forced and compulsory labor, such as the Labour Contract Law, Women's Rights Protection Law, Prohibition of Child Labor Regulation. Via checking Employee roster, labour contracts and Payroll statement/30/ and interviewing stakeholders, it was verified that the project fully complies with the relevant laws and respects fundamental right of employee, All the labour is admitted through a legal recruitment process which includes background checks aimed at ensuring that the employees are not exploited and abused. Laborers have the right to resign anytime.
Child labor	China has strict prohibition for child labour. Article 15 of Labour Law of People's Republic of China enforces: The employing units are prohibited from recruiting minors under the age of 16. Via checking Employee roster, labour contracts and Payroll

	statement/30/ and interviewing stakeholders, it was verified that the project proponent strictly obeys the law, and does not involve child labour neither in construction nor at operation of project activity. Therefore, it is confirmed the project does not use child labor.
Human trafficking	Via checking Employee roster, labour contracts and Payroll statement/30/ and interviewing stakeholders, it was verified that the project proponent adopts recruitment and employment policies which comply with ILO standards and the Labor Law of China. All the employees are adults and admitted through a legal recruitment process. The project does not involve any form of human trafficking.

4.2.7.2 Human Rights

Risks identified	Evidence gathering activities, evidence checked, and assessment conclusion
Human Rights	By checking the joint PD&MR/03/, MR/01/, FSR Report/39/, Project Approval /40/ and EIA approval /41/, it is confirmed the project has been approved by Chinese government, the project construction and operation comply with all applicable laws and regulations. In this sense, the project should meet all the requirement of regulation and laws set up by Chinese government in aspect of human rights. By checking the survey questionnaires /29/ and interviewing with PP and stakeholders, it was verified the project is not in conflict with the economic livelihood or other issue of the local community and respect all human rights. The stakeholder consultation has been conducted to take their opinion prior to the project start, and there are various channels of on-going communication. Thus, the project does not cause any human rights abuse and respects internationally proclaimed human rights issue. China has published relevant regulations and practice in line with the treaties, such as "Labor Contract Law" to make sure that no action can be taken against human rights. Especially with regard to gender equality, China has published the "Women's Rights Protection Law", which stipulates detailed enforcement rules to provide support and benefits to women. China prohibits discrimination on the basis of a person's race, sex, religion, place of birth, or social status.

4.2.7.3 Indigenous Peoples and Cultural Heritage

Risks identified	Evidence gathering activities, evidence checked, and assessment conclusion
Indigenous Peoples and Cultural Heritage	Not applicable. By checking the FSR Report/39/, Project Approval /40/, EIA approval /41/ approved by government and via interviewing with stakeholders, it is confirmed that the project site is not a cultural heritage site and the construction of the project activity does not require or cause any form of physical or economic relocation of peoples. Therefore, cultural heritage is not involved in the project.

4.2.7.4 Property Rights

Risks identified	Evidence gathering activities, evidence checked, and assessment conclusion
Disputes over rights to territories and resources	By checking Project Approval /40/ and EIA approval /41/, it is confirmed the project activity has been approved by local government, the project owner has the legal right to collect and use landfill gas. Therefore, the project does not involve in the property rights of disputes over rights to territories and resources.
Respect for property rights	The project site is owned by the local government, and the project is constructed and operated after obtaining government approval, so there is no impact on the property rights of local IPs, LCs, and customary rights holders.

4.2.7.5 Benefit Sharing

Item	Evidence gathering activities, evidence checked, and assessment conclusion
Summary of the benefit sharing plan	Not applicable as the project is constructed and operated by Guangzhou LEO-KING Environmental Technology Co., Ltd., owned by local government and thus no benefit sharing plan is involved between PP and the property right of IPs, and customary rights holders.

Benefit sharing during the monitoring period	Not applicable as the project does not involve the property rights of stakeholders, IPs, LCs, and customary rights holders during its lifetime and thus no benefit sharing plan is involved between PP and the stakeholders.
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4.2.8 Ecosystem Health

Item	Evidence gathering activities, evidence checked, and assessment conclusion
Impacts on biodiversity and ecosystems	By checking EIA approval /41/ approved by government and via interviewing with stakeholders on site, it is confirmed that the project does not alter biodiversity and is not located in high conservation value areas, and there are no valuable plant and animal species. Therefore, it is confirmed the project does not adversely impacted biodiversity and ecosystems during the monitoring period.
Soil degradation and soil erosion	By checking EIA approval /41/ approved by government and via site visit, it is confirmed that the project will not cause soil degradation and soil erosion during its lifetime. Therefore, it is confirmed the project does not adversely impacted soil during the monitoring period.
Water consumption and stress	By checking EIA approval /41/ approved by government and via site visit, it is confirmed that the project does not involve groundwater consumption, the sewage of the project is discharged to the sewage treatment plant of the industrial park for further treatment and reuse. Therefore, it is confirmed the project will not cause water consumption stress.

4.2.8.1 Rare, Threatened, and Endangered species

Item	Evidence gathering activities, evidence checked, and assessment conclusion
Species or habitat	Not applicable. By checking the FSR Report/39/, Project Approval /40/, EIA approval /41/ approved by government and via interviewing with stakeholders, it is confirmed that the project is not located in or adjacent to habitats for rare, threatened, or endangered species, and it does not adversely impact species or habitat during the monitoring period.

Areas needed for habitat connectivity	Not applicable. By checking the FSR Report/39/, Project Approval /40/, EIA approval /41/ approved by government and via interviewing with stakeholders, it is confirmed that the project is not located in or adjacent to the areas needed for habitat connectivity, and it does not adversely impacted areas needed for habitat connectivity during the monitoring period.
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	Evidence gathering activities, evidence checked, and assessment conclusion
Habitats for rare, threatened, and endangered species	Not applicable. By checking the FSR Report/39/, Project Approval /40/, EIA approval /41/ approved by government and via interviewing with stakeholders, it is confirmed that there is no rare, threatened, and endangered species in the project site, and the project does not involve habitats for rare, threatened, or endangered species.
Areas for habitat connectivity	Not applicable. By checking the FSR Report/39/, Project Approval /40/, EIA approval /41/ approved by government and via interviewing with stakeholders, it is confirmed that the project does not involve Areas for habitat connectivity.

4.2.8.2 Introduction of Species

Species introduced	Evidence gathering activities, evidence checked, and assessment conclusion
N/A	Not applicable. By checking the FSR Report/39/, Project Approval /40/, EIA approval /41/ approved by government and via interviewing with stakeholders, it is confirmed that the project does not involve introduction of any species.

Existing invasive species	Evidence gathering activities, evidence checked, and assessment conclusion
N/A	Not applicable. By checking the FSR Report/39/, Project Approval /40/, EIA approval /41/ approved by government and via interviewing with stakeholders, it is confirmed that the project does not involve existing invasive species.

	Evidence gathering activities, evidence checked, and
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	assessment conclusion
Invasive species	Not applicable. By checking the FSR Report/39/, Project Approval /40/, EIA approval /41/ approved by government and via interviewing with stakeholders, it is confirmed that the project does not involve any Invasive species.

4.2.8.3 Ecosystem conversion

Item	Evidence gathering activities and evidence checked
Ecosystem conversion	Not applicable as the project is not a ARR, ALM, WRC or ACoGS project.

4.3 Accuracy of Reduction and Removal Calculations

[Data and parameters available at validation]

The data and parameters fixed ex ante available at validation have reported in the section 5.1 of the joint PD & MR/03/, and that have been verified and confirmed appropriate in the section 3.4.8 of the joint-validation-verification report /04/.

In this monitoring report, the data and parameters (GWP_{CH4} , NCV_{CH4} , $\eta_{PJflare,m}$, ϕ_y , OX , F , $DOC_{f,y}$, MCF_y , DOC_j , k_j , $EF_{grid,OM,y}$, $EF_{grid,BM,y}$, $EF_{grid,CM,y}$, $EF_{CH4,default}$, $f_{CH4,default}$, R_u , MM_i , P_n , T_n , $\rho_{i,n}$ & $\rho_{RG,n}$, $TDL_{j,y}$ and $TDL_{k,y}$, $RATE_{compliance,t,y}$) available at validation stage listed in the table below have been checked by CCSC and found consistent with the registered joint PD & MR/03/, which is fixed and used to ex-ante calculated for this crediting period.

Parameter	Description	Value	Unit	Source of data
GWP_{CH_4}	Global warming potential of CH_4	28	tCO_2e/tCH_4	joint PD & MR/03/
NCV_{CH_4}	Net calorific value of methane at reference conditions	0.0504	TJ/t CH_4	joint PD & MR/03/
$\eta_{PJflare,m}$	Flare efficiency in minute m	90%	Dimensionless	joint PD & MR/03/
ϕ_y	Model correction factor to account for model uncertainties for year y	0.85	/	joint PD & MR/03/
OX	Oxidation factor (reflecting the amount of methane from SWDS that is oxidized in the soil or other material covering the waste)	0.1	/	joint PD & MR/03/
F	Fraction of methane in the SWDS gas (volume fraction)	0.5	/	joint PD & MR/03/
$DOC_{f,y}$	Default value for the fraction of degradable organic carbon (DOC) in MSW that decomposes in the SWDS	0.5	Weight fraction	joint PD & MR/03/
MCF_y	Methane correction factor	1.0	/	joint PD & MR/03/

DOC _j	Fraction of degradable organic carbon in the waste type j (weight fraction)	Apply the following values for the different waste types j for MSW:						/	joint PD & MR/03/
		Waste classification			DOC _j (% wet waste)				
		Wood and wood product			43				
		Pulp, paper and cardboard (other than sludge)			40				
		Food, food waste, beverage and tobacco (other than sludge)			15				
		Textiles			24				
		Gardens, yard and park was			20				
		Glass, metal and other inert waste			0				
		k _j	Decay rate for the waste type j	Apply the following default values for the different waste types j:					
Waste type j				Boreal and Temperate (MAT≤20°C)		Tropical (MAT>20°C)			
				Dry (MAP/ PET<1)	Wet (MAP/ PET>1)	Dry (MAP <1000mm)	Wet (MAP> 1000m m)		
Slowly degrading	Pulp, paper, cardboard (other than sludge), textiles			0.04	0.06	0.045	0.07		
	Wood, wood products and straw			0.02	0.03	0.025	0.035		

		Moderately degrading	Other (non-food) organic putrescible garden and park waste	0.05	0.10	0.065	0.17		
		Rapidly degrading	Food, food waste, sewage sludge, beverages and tobacco	0.06	0.185	0.085	0.40		
		Note: MAT– mean annual temperature, MAP – Mean annual precipitation, PET – potential evapotranspiration. MAP/PET is the ratio between the mean annual precipitation and the potential evapotranspiration. The average temperature of Guangzhou city is 23℃. The annual mean precipitation is 1,722mm2, thus, the climate is classed as: Tropical (MAT>20℃), Wet (MAP >1000mm), and the value of k _j for this climate is applied for the project.							
EF _{grid,OM,y}	Operating margin CO ₂ emission factor in year y	0.8042						tCO ₂ /MWh	joint PD & MR/03/
EF _{grid,BM,y}	Build margin CO ₂ emission factor in year y	0.2135						tCO ₂ /MWh	joint PD & MR/03/
EF _{grid,CM,y}	Combined Margin Emission Factor of CCPG which the Project is connected to	0.50885						tCO ₂ /MWh	joint PD & MR/03/

² FSR

$EF_{CH_4, default}$	Default emission factor for the fraction of CH_4 produced that leak from the anaerobic digester	0.028	t CH_4 leaked / t CH_4 produced	joint PD & MR/03/
$f_{CH_4, default}$	Default value for the fraction of methane in the biogas	0.6	$m^3 CH_4 / m^3 biog$ as corrected to reference conditions	joint PD & MR/03/
R_u	Universal ideal gases constant	8,314	Pa.m ³ /kmol.K	joint PD & MR/03/
MM_i	Molecular mass of greenhouse gas CH_4	16.04	kg/kmol	joint PD & MR/03/
P_n	Total pressure at normal conditions	101,325	Pa	joint PD & MR/03/
T_n	Temperature at normal conditions	273.15	K	joint PD & MR/03/
$\rho_{i,n}$ & $\rho_{RG,n}$	Density of greenhouse gas CH_4 in the gaseous stream at normal conditions	0.71566	Kg gas i/m ³ gas I, i=RG= CH_4	joint PD & MR/03/
$TDL_{j,y}$ and $TDL_{k,y}$	Average technical transmission and distribution losses for providing electricity to source j or k in year y	$TDL_{j,y}$: 3% $TDL_{k,y}$: 3%	/	joint PD & MR/03/
$RATE_{compliance, t, y}$	Rate of compliance with a regulatory requirement to implement the alternative waste treatment t implemented in the project activity	0	Fraction	joint PD & MR/03/

The data and parameters ex-post monitored available at verification have reported in the section 5.2 of the joint PD & MR/03/, such as f_y , W_x , $P_{n,j,x}$, Z_x , $EC_{BL,k,y}$, $EC_{PJ,j,y}$, $Q_{CH4,y}$, $V_{t,db,n}$, $F_{CH4,RG,m}$, $V_{RG,t,db}$, $v_{i,t,db}$ ($v_{RG,t,db}$), Operation hours (to calculate $Q_{CH4,y}$)/Operation hours (to calculate $F_{CH4,RG,m}$).

The verification team has assessed the implementation of monitoring system by the project owner against the registered monitoring plan. A short summary on the verification of every parameter listed in the monitoring plan and used for emission reduction calculation is provided below:

Monitoring Parameter Requirement	Assessment/ Observation by the VVB
Data / Parameter:	f_y
Data Unit	-
Description	Fraction of methane captured at the SWDS and flared, combusted or used in another manner that prevents the emissions of methane to the atmosphere in year y
Description of measurement methods and procedures applied	According to the ACM0022 (Version 03.0), if the requirement does not specify any amount or percentage of LFG that should be destroyed but require the installation of a system to capture and flare the LFG, then it is assumed $f_y = 0.2$. According to “2021-2025 Five-Year Plan for the Development of Urban Domestic Waste Sorting and Treatment Facilities” (2021)³. local government should strengthen supervision over the operation of existing landfills and continuously optimize the operation and management model and just recommend installing the landfill gas collection and utilization system. In China, although most landfills in China are not required to equipped with gas collection devices, the scenario M2 is more conservative option to M3. then it is assumed $f_y = 0.2$.
Monitoring/Reporting frequency:	Annually
Value applied	0.2
Comments	-

³ <https://www.ndrc.gov.cn/xxgk/zcfb/tz/202105/P020210513624038179527.pdf>

Means of verification	Through on-site inspection, and interviewing with the staff of the project.
Findings	The parameter was followed up by the project owner and was determined once for the crediting period. In China, the requirement does not specify any amount or percentage of LFG that should be destroyed but require the installation of a system to capture and flare the LFG, so $f_y = 0.2$.

Monitoring Parameter Requirement	Assessment/ Observation by the VVB	
Data / Parameter:	W_x	
Data Unit	t	
Description	Total amount of waste disposed in a SWDS in year x	
Description of measurement methods and procedures applied	Measure on wet basis	
Monitoring/Reporting frequency:	Continuously, aggregated at least annually for year x Recording monthly, aggregated annually	
Value applied	year	Value
	01-January-2023 to 31-December-2023	505,371.01
Comments	The amount of waste disposed in a SWDS was monitored by the weighbridges install at the gate of the project site. The PP monitors the weight of the MSW regularly. There are four weighbridges install at the gate of the project site, but in this monitoring period, just one weighbridge was applied to monitor the amount of waste disposed by the project. The other three weighbridges were used as backup and were also calibrated regularly. The three backup weighbridges were not used in this monitoring period according to the actual production needs. The weighbridges were calibrated annually. The weighbridge information used for monitoring the amount of waste disposed by the project is as follows:	

	Monitoring equipment	Weighbridge
	Type	SCS-50
	Serial No	22050414BD
	Accuracy	III
	Calibration date	01-January-2023
	Validity date	31-December-2023
	The information of three backup weighbridges are as follows:	
	Monitoring equipment	Weighbridge (Backup 1, 2, 3)
	Type	SCS-50
	Serial No	22050413BD、22050415BD、 22050416BD
	Accuracy	III
	Calibration date	01-January-2023
Means of verification	Validity date	31-December-2023
	Periodic calibration against a primary device provided by an independent accredited laboratory is mandatory for all projects applying large scale methodology(ies). Calibration should be carried out every year according to the relevant national regulation.	
	By checking the data included in the MR(version 2.1) /01/ and ER spreadsheet /02/ against the summary Table of quantity and fraction of treated fresh waste covering this monitoring period/18/ to verify the Information flow.	
	Through on-site observation, and checking the metering instruments and calibration reports to verify the monitoring method and Calibration.	
Findings	The monitoring frequency is continuous. And the data was recorded every day and summarized monthly by project owner.	
	The verification team has checked the data included in the MR (version 2.1) /01/ and ER spreadsheet /02/ against the summary Table of quantity and fraction of treated fresh waste covering this monitoring period/18/ and can confirm that the reported monitoring data is consistent with the documented evidences, the waste amount disposed in the SWDS have been verified to be reasonable.	

Through on-site observation and checking calibration reports/19/, the verification team confirmed that, the metering instruments Weighbridges are calibrated every year by PP in accordance with the national standard. During this monitoring period, the Weighbridges are calibrated by an independent accredited laboratory Guangzhou institute of measurement and testing technology. The accuracy level of monitoring meters is same as described in the registered joint PD&MR /03/.

Monitoring Parameter Requirement	Assessment/ Observation by the VVB														
Data / Parameter:	$P_{n,j,x}$														
Data Unit	-														
Description	Weight fraction of the waste type j in the sample n collected during the year x														
Description of measurement methods and procedures applied	Sample the waste composition, using the waste types j, as provided in the table for DOC_j and k_j , and weigh each waste fraction (measure on wet basis)														
Monitoring/Reporting frequency:	Minimum of three samples every three months														
Value applied	The annual data is calculated based on the number of samples and each corresponding weight fraction of waste composition. In this monitoring period, three samples were collected by project owner every three months, and which were measured according to the relevant standard. Please refer to ER spreadsheet for every sample data during this monitoring period. <table border="1"> <tr> <td>Year</td><td>2023</td></tr> <tr> <td>Food</td><td>75.53%</td></tr> <tr> <td>Paper</td><td>6.72%</td></tr> <tr> <td>Garden and park waste</td><td>0.00%</td></tr> <tr> <td>Wood</td><td>0.00%</td></tr> <tr> <td>Others (Glass, plastic, metal, etc)</td><td>13.37%</td></tr> <tr> <td>Textile</td><td>4.38%</td></tr> </table>	Year	2023	Food	75.53%	Paper	6.72%	Garden and park waste	0.00%	Wood	0.00%	Others (Glass, plastic, metal, etc)	13.37%	Textile	4.38%
Year	2023														
Food	75.53%														
Paper	6.72%														
Garden and park waste	0.00%														
Wood	0.00%														
Others (Glass, plastic, metal, etc)	13.37%														
Textile	4.38%														

Comments	-
Means of verification	By checking the data included in the MR (version 2.1) /01/ and ER spreadsheet /02/ against the summary Table of quantity and fraction of treated fresh waste covering this monitoring period/18/ to verify the Information flow.
Findings	The verification team has checked the data included in the MR (version 2.1) /01/ and ER spreadsheet /02/ against the summary Table of quantity and fraction of treated fresh waste covering this monitoring period/18/ and can confirm that the reported monitoring data is consistent with the documented evidences.

Monitoring Parameter Requirement	Assessment/ Observation by the VVB		
Data / Parameter:	Zx		
Data Unit	-		
Description	Number of samples collected during the year x		
Description of measurement methods and procedures applied	Minimum of three samples every three months		
Monitoring/Reporting frequency:	Continuously, aggregated annually		
Value applied	year	Value	
	01-January-2023 to 31-December-2023	12	
Comments	The sample size and sampling technique must ensure the sample is representative. The samples will be measured by the project owner as per relevant standard. For Application B and if the waste includes more than one waste type j. In this monitoring period, the number of samples collected is at least three every three months, which is in line with the requirement of the methodology tool.		
Means of verification	By checking the data included in the MR(version 2.1) /01/ and ER spreadsheet /02/ against the summary Table of quantity and fraction		

	of treated fresh waste covering this monitoring period/18/ to verify the Information flow.
Findings	The verification team has checked the data included in the MR (version 2.1) /01/ and ER spreadsheet /02/ against the summary Table of quantity and fraction of treated fresh waste covering this monitoring period/18/ and can confirm that the reported monitoring data is consistent with the documented evidences.

Monitoring Parameter Requirement	Assessment/ Observation by the VVB				
Data / Parameter:	EC _{BL,k,y}				
Data Unit	MWh				
Description	Quantity of electricity that would be consumed by the baseline electricity consumption source k in year y				
Description of measurement methods and procedures applied	Electricity meter(s) and monthly recorded. All electronic data and paper documents will be archived for two years following the end of the crediting period. In this monitoring period, the electricity is monitored continuously by electricity meter and the recorded at 24:00 on the last day of every month by remote reading system.				
Monitoring/Reporting frequency:	Monitoring continuously, Recording monthly				
Value applied	Period	Meter recording	Meter recording (adjusted value)	Receipts	Minimum
	01-January-2023 to 31-January-2023	479.548	477.150	479.400	477.150
	01-February-2023 to 28-February-2023	962.166	957.355	962.200	957.355
	01-March-2023 to 31-March-2023	474.786	472.412	475.000	472.412
	01-April-2023 to 30-April-2023	1,235.798	1,229.619	1,235.600	1,229.619

	01-May-2023 to 31-May-2023	888.644	884.201	888.600	884.201
	01-June-2023 to 30-June-2023	1,050.310	1,045.058	1,050.200	1,045.058
	01-July-2023 to 31-July-2023	599.076	596.081	599.200	596.081
	01-August-2023 to 31-August-2023	855.518	851.240	855.600	851.240
	01-September-2023 to 30-September-2023	539.776	537.077	539.400	537.077
	01-October-2023 to 31-October-2023	1,032.446	1,027.284	1,032.800	1,027.284
	01-November-2023 to 30-November-2023	1,246.356	1,240.124	1,246.000	1,240.124
	01-December-2023 to 31-December-2023	1,314.250	1,307.679	1,314.200	1,307.679
	total	10,678.674	10,625.281	10,678.200	10,625.281
Comments	EC _{BL,k,y} is equivalent to the net amount of electricity generated by the alternative waste treatment process t and exported to the grid or displacing fossil fuel fired captive energy plant in year y (EG _{t,y}), which is the electricity exported by the project activity.				
	The bidirectional electricity meters M1(main meter) and M2 (backup meter) with accuracy of 0.5S installed in the high voltage switch room of the project site.				
	Monitoring equipment		Electricity meter		
	Type	DSSD71		DSSD71	
	Serial No	001800010302		001800010306	
	Accuracy	0.5S		0.5S	
	Calibration date	29-Jan-2022 18-Oct-2024		29-Jan-2022 18-Oct-2024	
	Validity date	29-Jan-2022 18-Oct-2024		29-Jan-2022 18-Oct-2024	
Periodic calibration against a primary device provided by an independent accredited laboratory is mandatory for all projects applying large scale					

	methodology(ies). Calibration should be carried out every two years according to the relevant national regulation.
Means of verification	By checking the data included in the MR(version 2.1) /01/ and ER spreadsheet /02/ against the Statistic of production data covering this monitoring period/17/, Electricity invoices and Power Settlement Statement for electricity export issued by local power grid company/14/ to verify the Information flow. Through on-site observation, and checking the metering instruments and calibration reports to verify the monitoring method and Calibration.
Findings	The monitoring frequency is continuous. And the data was recorded every day and summarized monthly by project owner. The verification team has checked the data included in the MR (version 2.1) /01/ and ER spreadsheet /02/ against the Statistic of production data covering this monitoring period/17/, Electricity invoices and Power Settlement Statement for electricity export issued by local power grid company/14/ and can confirm that the reported monitoring data is consistent with the documented evidences, the adjustment of electricity quantity have been verified to be reasonable. Through on-site observation and checking calibration reports, the assessment team confirmed that, during this monitoring period, the two electricity meters have been tested and calibrated by the grid company annually, however no calibration reports were issued to the project owner and consequently not available for ER verification. Therefore, for conservativeness, PP have made a adjustment of the monitoring results for the whole monitoring period in accordance with para.366 of CDM VVS. According to the accuracy level of monitoring meters described in the registered joint PD&MR /03/ and Electricity meter nameplate on-site, the accuracy of the electricity meters is 0.5S, which means the maximum permissible error of the electricity meters is 0.5%. The adjustment factor is determined as 0.5%. As per the calibration reports dated 18/10/2024 which is after the monitoring period in consideration, the error of the electricity meters is smaller than the maximum permissible error. 366 of CDM VVS for PA by deducting the maximum permissible error (0.5%) of the electricity meters from the quantity of electricity supplied by the project plant to the grid and adding 0.5% to the quantity of electricity delivered to the project plant from the grid. thus,the conservative value = The monitored value * (1-0.5%).

Monitoring Parameter Requirement	Assessment/ Observation by the VVB
Data / Parameter:	$EC_{PJ,j,y}$
Data Unit	MWh
Description	Quantity of electricity consumed by the project electricity consumption source j in year y
Description of measurement methods and procedures applied	Electricity meter(s) and monthly recorded. All electronic data and paper documents will be archived for two years following the end of the crediting period. In this monitoring period, the electricity is monitored continuously by electricity meter and the recorded at 24:00 on the last day of every month by remote reading system.
Monitoring/Reporting frequency:	Monitoring continuously, Recording monthly

Value applied	Period	Meter recording	Meter recording (adjusted value)	Receipts	Minimum
	01-January-2023 to 31-January-2023	1,633.000	1,641.165	1,633.000	1,641.165
	01-February-2023 to 28-February-2023	777.600	781.488	777.400	781.488
	01-March-2023 to 31-March-2023	1,056.800	1,062.084	1,057.000	1,062.084
	01-April-2023 to 30-April-2023	620.000	623.100	619.800	623.100
	01-May-2023 to 31-May-2023	661.200	664.506	661.200	664.506
	01-June-2023 to 30-June-2023	563.400	566.217	563.400	566.217
	01-July-2023 to 31-July-2023	931.200	935.856	931.200	935.856
	01-August-2023 to 31-August-2023	827.800	831.939	827.800	831.939
	01-September-2023 to 30-September-2023	702.600	706.113	702.600	706.113
	01-October-2023 to 31-October-2023	780.800	784.704	780.800	784.704
	01-November-2023 to 30-November-2023	217.600	218.688	217.600	218.688
	01-December-2023 to 31-December-2023	85.200	85.626	90.000	90.000
	total	8,857.200	8,901.486	8,861.800	8,905.860
Comments	bidirectional electricity meters M1(main meter) and M2 (backup meter) with accuracy of 0.5S installed in the high voltage switch room of the project site.				
	Monitoring equipment	Electricity meter			
	Type	DSSD71	DSSD71		
	Serial No	001800010302	001800010306		
	Accuracy	0.5S	0.5S		

	Calibration date	29-Jan-2022 18-Oct-2024	29-Jan-2022 18-Oct-2024
	Validity date	29-Jan-2022 18-Oct-2024	29-Jan-2022 18-Oct-2024
	Periodic calibration against a primary device provided by an independent accredited laboratory is mandatory for all projects applying large scale methodology(ies). Calibration should be carried out every year according to the relevant national regulation.		
Means of verification	By checking the data included in the MR(version 2.1) /01/ and ER spreadsheet /02/ against the Statistic of production data covering this monitoring period/17/, Electricity invoices and Power Settlement Statement for electricity consumed by the project electricity issued by local power grid company/15/ to verify the Information flow. Through on-site observation, and checking the metering instruments and calibration reports to verify the monitoring method and Calibration.		
Findings	The monitoring frequency is continuous. And the data was recorded every day and summarized monthly by project owner. The verification team has checked the data included in the MR (version 2.1) /01/ and ER spreadsheet /02/ against the Statistic of production data covering this monitoring period/17/, Electricity invoices and Power Settlement Statement for electricity consumed by the project electricity issued by local power grid company/15/ and can confirm that the reported monitoring data is consistent with the documented evidences, the adjustment of electricity quantity have been verified to be reasonable. Through on-site observation and checking calibration reports, the assessment team confirmed that, during this monitoring period, the two electricity meters have been tested and calibrated by the grid company annually, however no calibration reports were issued to the project owner and consequently not available for ER verification. Therefore, for conservativeness, PP have made a adjustment of the monitoring results for the whole monitoring period in accordance with para.366 of CDM VVS. According to the accuracy level of monitoring meters described in the registered joint PD&MR /03/ and Electricity meter nameplate on-site, the accuracy of the electricity meters is 0.5S, which means the maximum permissible error of the electricity meters is 0.5%. The adjustment factor is determined as 0.5%. As per the calibration reports dated 18/10/2024 which		

is after the monitoring period in consideration, the error of the electricity meters is smaller than the maximum permissible error. 366 of CDM VVS for PA by deducting the maximum permissible error (0.5%) of the electricity meters from the quantity of electricity supplied by the project plant to the grid and adding 0.5% to the quantity of electricity delivered to the project plant from the grid. thus, the conservative value = The monitored value * (1+0.5%).

Monitoring Parameter Requirement	Assessment/ Observation by the VVB	
Data / Parameter:	$Q_{CH_4, y}$	
Data Unit	t CH ₄ /y	
Description	Quantity of methane produced in the digester in year y	
Description of measurement methods and procedures applied	-	
Monitoring/Reporting frequency:	-	
Value applied	year	Value
	01-January-2023 to 31-December-2023	8,377
Comments	-	
Means of verification	By checking the data included in the MR(version 2.1) /01/ and ER spreadsheet /02/ against the Statistic of production data covering this monitoring period/17/ to verify the Information flow. Through on-site observation, and checking the metering instruments and calibration reports to verify the monitoring method and Calibration.	
Findings	The verification team has checked the data included in the MR (version 2.1) /01/ and ER spreadsheet /02/ against the Statistic of production data covering this monitoring period/17/ and can confirm	

that the reported calculation data is consistent with the documented evidences, the calculation of methane quantity produced in the digester have been verified to be correct and reasonable.

Monitoring Parameter Requirement	Assessment/ Observation by the VVB		
Data / Parameter:	$V_{t,db,n}$		
Data Unit	m³ dry gas/h		
Description	Volumetric flow of the gaseous stream in time interval t on a dry basis at normal conditions		
Description of measurement methods and procedures applied	The parameters of $V_{t,db,n}$ is measured by a flow meter continuously, which will be converted automatically into standard value $V_{t,db,n}$ (at the normal condition of 0 °C and 101,325 Pa) by the recovery monitoring system		
Monitoring/Reporting frequency:	Monitoring continuously, Recording monthly		
Value applied	In this monitoring period, volumetric flow of the biogas is monitored continuously on a dry basis at normal conditions and the average value is recorded and calculated on a monthly basis.		
	Period	Measured Value	Adjusted Value
	01-January-2023 to 31-January-2023	1,404	1,404
	01-February-2023 to 28-February-2023	2,174	2,174
	01-March-2023 to 31-March-2023	1,794	1,794
	01-April-2023 to 30-April-2023	2,329	2,329
	01-May-2023 to 31-May-2023	2,405	2,405
	01-June-2023 to 30-June-2023	2,284	2,284
	01-July-2023 to 31-July-2023	2,196	2,196

	01-August-2023 to 31-August-2023	2,293	2,293
	01-September-2023 to 30-September-2023	2,215	2,215
	01-October-2023 to 31-October-2023	2,473	2,473
	01-November-2023 to 30-November-2023	2,725	2,725
	01-December-2023 to 31-December-2023	2,690	2,703
Comments	Flow meter installed at inlet of the gas tank		
	Monitoring equipment	Flow meter	
	Type	ZD7200MT5HEX	
	Serial No	2106L3546001	
	Accuracy	±1.5%	
	Calibration date	29-January-2022	
	Validity date	28-January-2024	
	On 07-Dec-2023, this old flow meter was changed by a new one for a better accuracy. The key information of the newly installed flow meter is shown as below:		
	Monitoring equipment	Flow meter (new)	
	Type	RVM-VS12 II JF63N2	
	Serial No	18101501	
	Accuracy	±0.5%	
	Calibration date	18-Oct-2024	
	Validity date	17-Oct-2026	
	Periodic calibration against a primary device provided by an independent accredited laboratory is mandatory for all projects applying large scale methodology(ies). Calibration should be carried out every two years according to the relevant national regulation.		

Means of verification	By checking the data included in the MR(version 2.1) /01/ and ER spreadsheet /02/ against the Statistic of production data covering this monitoring period/17/ to verify the Information flow. Through on-site observation, and checking the metering instruments and calibration reports to verify the monitoring method and Calibration.
Findings	The verification team has checked the data included in the MR (version 2.1) /01/ and ER spreadsheet /02/ against the Statistic of production data covering this monitoring period/17/ and can confirm that the reported monitoring data is consistent with the documented evidences, the adjustment of volumetric flow of the gaseous stream have been verified to be reasonable. Through on-site observation and checking calibration reports, the assessment team confirmed that, during this monitoring period, the old flow meter installed at inlet of the gas tank have been tested and calibrated by PP every two years, however, the calibration of newly installed flow meter on 07-Dec-2023 has been delayed, for conservativeness, PP have made a adjustment of the monitoring results of December 2023 in accordance with para.366 of CDM VVS. According to the newly installed flow meter nameplate on-site and calibration reports, the accuracy of the newly installed flow meter is 0.5S, which means the maximum permissible error of the flow meter is 0.5%. The adjustment factor is determined as 0.5%. As per the calibration reports dated 18/10/2024 which is after the monitoring period in consideration, the error of the flow meter is smaller than the maximum permissible error. 366 of CDM VVS for PA by adding 0.5% to the value of volumetric flow of the gaseous stream. thus, the conservative value = The monitored value * (1+0.5%).

Monitoring Parameter Requirement	Assessment/ Observation by the VVB
Data / Parameter:	F _{CH4, RG, m}

Data Unit	t CH ₄				
Description	Mass flow of methane in the residual gas in the minute m				
Description of measurement methods and procedures applied	The verification details have been reported in Section 4.4 of this report.				
Monitoring/Reporting frequency:	-				
Value applied	<table border="1"> <tr> <th>Period</th><th>Value</th></tr> <tr> <td>01-January-2023 to 31-December-2023</td><td>74</td></tr> </table>	Period	Value	01-January-2023 to 31-December-2023	74
Period	Value				
01-January-2023 to 31-December-2023	74				
Comments	--				
Means of verification	By checking the data included in the MR(version 2.1) /01/ and ER spreadsheet /02/ against the Statistic of production data covering this monitoring period/17/ to verify the Information flow.				
Findings	The verification team has checked the data included in the MR (version 2.1) /01/ and ER spreadsheet /02/ against the Statistic of production data covering this monitoring period/17/ and can confirm that the reported calculation data is consistent with the documented evidences, the calculation of Mass flow of methane in the residual gas have been verified to be correct and reasonable.				

Monitoring Parameter Requirement	Assessment/ Observation by the VVB
Data / Parameter:	$V_{RG,t,db}$
Data Unit	m ³ dry gas/h
Description	Volumetric flow of the residue gas in time interval t on a dry basis at normal conditions
Description of measurement methods and procedures applied	The parameters of $V_{t,db,n}$ is measured by a flow meter continuously, which will be converted automatically into standard value $V_{t,db,n}$ (at the normal condition of 0 °C and 101,325 Pa) by the recovery monitoring system

Monitoring/Reporting frequency:	Monitoring continuously, Recording monthly																										
Value applied	In this monitoring period, volumetric flow of the remaining biogas is monitored continuously on a dry basis at normal conditions and the average value is recorded and calculated on a monthly basis. <table> <tr> <th>Period</th><th>Value</th></tr> <tr> <td>01-January-2023 to 31-January-2023</td><td>1,177</td></tr> <tr> <td>01-February-2023 to 28-February-2023</td><td>2,046</td></tr> <tr> <td>01-March-2023 to 31-March-2023</td><td>1,607</td></tr> <tr> <td>01-April-2023 to 30-April-2023</td><td>2,103</td></tr> <tr> <td>01-May-2023 to 31-May-2023</td><td>2,191</td></tr> <tr> <td>01-June-2023 to 30-June-2023</td><td>2,036</td></tr> <tr> <td>01-July-2023 to 31-July-2023</td><td>0</td></tr> <tr> <td>01-August-2023 to 31-August-2023</td><td>0</td></tr> <tr> <td>01-September-2023 to 30-September-2023</td><td>0</td></tr> <tr> <td>01-October-2023 to 31-October-2023</td><td>0</td></tr> <tr> <td>01-November-2023 to 30-November-2023</td><td>0</td></tr> <tr> <td>01-December-2023 to 31-December-2023</td><td>2,462</td></tr> </table>	Period	Value	01-January-2023 to 31-January-2023	1,177	01-February-2023 to 28-February-2023	2,046	01-March-2023 to 31-March-2023	1,607	01-April-2023 to 30-April-2023	2,103	01-May-2023 to 31-May-2023	2,191	01-June-2023 to 30-June-2023	2,036	01-July-2023 to 31-July-2023	0	01-August-2023 to 31-August-2023	0	01-September-2023 to 30-September-2023	0	01-October-2023 to 31-October-2023	0	01-November-2023 to 30-November-2023	0	01-December-2023 to 31-December-2023	2,462
Period	Value																										
01-January-2023 to 31-January-2023	1,177																										
01-February-2023 to 28-February-2023	2,046																										
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01-August-2023 to 31-August-2023	0																										
01-September-2023 to 30-September-2023	0																										
01-October-2023 to 31-October-2023	0																										
01-November-2023 to 30-November-2023	0																										
01-December-2023 to 31-December-2023	2,462																										
Comments	The Volumetric flow of the residue gas was measured by the Flow meter installed at inlet of the flare <table> <tr> <td>Monitoring equipment</td><td>Flow meter</td></tr> <tr> <td>Type</td><td>JF63N2</td></tr> <tr> <td>Serial No</td><td>18101502</td></tr> <tr> <td>Accuracy</td><td>0.5</td></tr> <tr> <td>Calibration date</td><td>29-January-2022</td></tr> <tr> <td>Validity date</td><td>28-January-2024</td></tr> </table>	Monitoring equipment	Flow meter	Type	JF63N2	Serial No	18101502	Accuracy	0.5	Calibration date	29-January-2022	Validity date	28-January-2024														
Monitoring equipment	Flow meter																										
Type	JF63N2																										
Serial No	18101502																										
Accuracy	0.5																										
Calibration date	29-January-2022																										
Validity date	28-January-2024																										

	Periodic calibration against a primary device provided by an independent accredited laboratory is mandatory for all projects applying large scale methodology(ies). Calibration will be carried out once every two years according to manufacturer's specifications. Accuracy level of monitoring meters is same as described in the registered joint PD&MR
Means of verification	By checking the data included in the MR(version 2.1) /01/ and ER spreadsheet /02/ against the Statistic of production data covering this monitoring period/17/ to verify the Information flow. Through on-site observation, and checking the metering instruments and calibration reports to verify the monitoring method and Calibration.
Findings	The monitoring frequency is continuous and converted automatically by the recovery monitoring system. The verification team has checked the data included in the MR (version 2.1) /01/ and ER spreadsheet /02/ against the Statistic of production data covering this monitoring period/17/ and can confirm that the reported monitoring data is consistent with the documented evidences, the volumetric flow of the remaining biogas have been verified to be correct and reasonable. Through on-site observation and checking calibration reports/19/, the verification team confirmed that, the flow meter installed at inlet of the flare are calibrated every two year by PP in accordance with the national standard. During this monitoring period, the flow meter is calibrated by an independent accredited laboratory South China National Centre of Metrology Guangdong Institute of Metrology. The accuracy level of monitoring meters is same as described in the registered joint PD&MR /03/.

Monitoring Parameter Requirement	Assessment/ Observation by the VVB
Data / Parameter:	$v_{i,t,db} (v_{RG,t,db})$

Data Unit	m ³ gas CH ₄ /m ³ dry gas		
Description	Volumetric fraction of greenhouse gas CH ₄ in a time interval t on a dry basis		
Description of measurement methods and procedures applied	Continuous gas analyzer operating on dry basis. Volumetric flow measurement should always refer to the actual pressure and temperature.		
Monitoring/Reporting frequency:	Monitoring continuously, Recording monthly		
Value applied	In this monitoring period, volumetric fraction of the CH ₄ in biogas is monitored continuously on a dry basis and recorded monthly.		
	Period	Measured Value	Adjusted Value
	01-January-2023 to 31-January-2023	61.54%	63.08%
	01-February-2023 to 28-February-2023	60.99%	62.51%
	01-March-2023 to 31-March-2023	64.21%	65.82%
	01-April-2023 to 30-April-2023	60.99%	62.51%
	01-May-2023 to 31-May-2023	61.76%	63.30%
	01-June-2023 to 30-June-2023	63.20%	64.78%
	01-July-2023 to 31-July-2023	64.86%	66.48%
	01-August-2023 to 31-August-2023	64.97%	66.59%
	01-September-2023 to 30-September-2023	63.78%	65.37%
	01-October-2023 to 31-October-2023	61.37%	62.90%
	01-November-2023 to 30-November-2023	61.72%	63.26%
	01-December-2023 to 31-December-2023	62.49%	64.05%

Comments	The value of both $v_{i,t,db}$ and $v_{RG,t,db}$ is same since the biogas from the same gas tank. The Volumetric fraction of greenhouse gas CH₄ was monitored by gas analyzer installed at inlet of gas tank <table border="1" data-bbox="597 405 1429 852"> <tr> <td>Monitoring equipment</td><td>Gas analyzer</td></tr> <tr> <td>Type</td><td>UE50</td></tr> <tr> <td>Serial No</td><td>62387/2</td></tr> <tr> <td>Accuracy</td><td>±2.5%</td></tr> <tr> <td>Calibration date</td><td>01-Jan-2022 18-Oct-2024</td></tr> <tr> <td>Validity date</td><td>31-Dec-2022 17-Oct-2026</td></tr> </table> Periodic calibration against a primary device provided by an independent accredited laboratory is mandatory for all projects applying large scale methodology(ies). Calibration should be carried out annually according to the relevant national regulation.	Monitoring equipment	Gas analyzer	Type	UE50	Serial No	62387/2	Accuracy	±2.5%	Calibration date	01-Jan-2022 18-Oct-2024	Validity date	31-Dec-2022 17-Oct-2026
Monitoring equipment	Gas analyzer												
Type	UE50												
Serial No	62387/2												
Accuracy	±2.5%												
Calibration date	01-Jan-2022 18-Oct-2024												
Validity date	31-Dec-2022 17-Oct-2026												
Means of verification	By checking the data included in the MR(version 2.1) /01/ and ER spreadsheet /02/ against the Statistic of production data covering this monitoring period/17/ to verify the Information flow. Through on-site observation, and checking the metering instruments and calibration reports to verify the monitoring method and Calibration.												
Findings	The verification team has checked the data included in the MR (version 2.1) /01/ and ER spreadsheet /02/ against the Statistic of production data covering this monitoring period/17/ and can confirm that the reported monitoring data is consistent with the documented evidences, the adjustment of Volumetric fraction of greenhouse gas CH₄ have been verified to be reasonable. Through on-site observation and checking calibration reports, the assessment team confirmed that, during this monitoring period, the calibration of the gas analyzer installed at inlet of gas tank has been delayed, and consequently not available for ER verification. Therefore, for conservativeness, PP have made a adjustment of the monitoring results for the whole monitoring period in accordance with para.366 of CDM VVS.												

	According to the gas analyzer nameplate installed at inlet of gas tank on-site, the accuracy of the the gas analyzer is 2.5%, which means the maximum permissible error of the gas analyzer is 2.5%. The adjustment factor is determined as 2.5%. As per the calibration reports dated 18/10/2024 which is after the monitoring period in consideration, the error of the gas analyzer is smaller than the maximum permissible error. 366 of CDM VVS for PA by adding 2.5% to the value of Volumetric fraction of greenhouse gas CH₄. thus, the conservative value = The monitored value * (1+2.5%).
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Monitoring Parameter Requirement	Assessment/ Observation by the VVB		
Data / Parameter:	Operation hours (to calculate $Q_{CH4,y}$) Operation hours (to calculate $F_{CH4,RG,m}$)		
Data Unit	Hours		
Description	The total operation hours of the project (to calculate $Q_{CH4,y}$) The total operation hours of the flare (to calculate $F_{CH4,RG,m}$)		
Description of measurement methods and procedures applied	-		
Monitoring/Reporting frequency:	Monitoring continuously, Recording monthly		
Value applied	In this monitoring period, operation hours of the project plant and flare are monitored continuously and recorded monthly by on-line production system. Please refer to ER spreadsheet for monthly data.		
	Year	Operation hours (to calculate $Q_{CH4,y}$)	Operation hours (to calculate $F_{CH4,RG,m}$)
	01-January-2023 to 31-December-2023	8,232	82

Comments	-
Means of verification	By checking the data included in the MR(version 2.1) /01/ and ER spreadsheet /02/ against the Statistic of production data covering this monitoring period/17/ to verify the Information flow.
Findings	The monitoring frequency is continuous and recorded monthly by on-line production system. The verification team has checked the data included in the MR (version 2.1) /01/ and ER spreadsheet /02/ against the Statistic of production data covering this monitoring period/17/ and can confirm that the reported monitoring data is consistent with the documented evidences, the operation hours of the project and the flare have been verified to be correct and reasonable.

Data / Parameter	V _{purchased,y}		
Data unit	m ³		
Description	Volume of the purchased biogas		
Description of measurement methods and procedures to be applied	The parameters is measured by a flow meter continuously, which can be converted automatically into standard value V _{purchased,y} (at the normal condition of 0°C and 101,325 Pa) by the recovery monitoring system		
Frequency of monitoring/recording	Monitoring continuously and recording monthly		
Value applied	In this monitoring period, volume of the purchased biogas is monitored continuously on a dry basis at normal conditions and the average value is recorded and calculated on a monthly basis.		
	Period	Measured Value	Adjusted value
	01-January-2023 to 31-January-2023	5,301	5,381
	01-February-2023 to 28-February-2023	45,713	46,399
	01-March-2023 to 31-March-2023	0	0
	01-April-2023 to 30-April-2023	214,394	217,610

	01-May-2023 to 31-May-2023	181,120	183,837												
	01-June-2023 to 30-June-2023	0	0												
	01-July-2023 to 31-July-2023	0	0												
	01-August-2023 to 31-August-2023	0	0												
	01-September-2023 to 30-September-2023	0	0												
	01-October-2023 to 31-October-2023	149,945	152,194												
	01-November-2023 to 30-November-2023	213,562	216,765												
	01-December-2023 to 31-December-2023	124,036	125,897												
	total	934,071	948,082												
Comments	The volume of the purchased biogas was measured by a flow meter continuously and converted automatically by the recovery monitoring system The key information of the flow meter installed to measure the purchased gas volume is shown as below: <table><tr><td>Monitoring equipment</td><td>Flow meter</td></tr><tr><td>Type</td><td>ZD7200MT3HEX</td></tr><tr><td>Serial No</td><td>2207L4628001</td></tr><tr><td>Accuracy</td><td>±1.5%</td></tr><tr><td>Calibration date</td><td>07-Dec-2023</td></tr><tr><td>Validity date</td><td>06-Dec-2025</td></tr></table> Periodic calibration against a primary device provided by an independent accredited laboratory is mandatory for all projects applying large scale methodology(ies). Calibration should be carried out once every two years according to manufacturer's specifications.			Monitoring equipment	Flow meter	Type	ZD7200MT3HEX	Serial No	2207L4628001	Accuracy	±1.5%	Calibration date	07-Dec-2023	Validity date	06-Dec-2025
	Monitoring equipment	Flow meter													
	Type	ZD7200MT3HEX													
Serial No	2207L4628001														
Accuracy	±1.5%														
Calibration date	07-Dec-2023														
Validity date	06-Dec-2025														
Means of verification	By checking the data included in the MR(version 2.1) /01/ and ER spreadsheet /02/ against the Biogas purchase Record and														

	settlement notes between the project owner and Grandtop Fushan Environmental Protection Energy Co., Ltd./43/ to verify the Information flow. Through on-site observation, and checking the metering instruments and calibration reports to verify the monitoring method and Calibration.
Findings	The verification team has checked the data included in the MR (version 2.1) /01/ and ER spreadsheet /02/ against the Biogas purchase Record and settlement notes between the project owner and Grandtop Fushan Environmental Protection Energy Co., Ltd./43/ and can confirm that the reported monitoring data is consistent with the documented evidences, the adjustment of Volume of the purchased biogas have been verified to be reasonable. Through on-site observation and checking calibration reports, the assessment team confirmed that, during this monitoring period, the calibration of the gas analyzer installed at inlet of gas tank has been delayed, and consequently not available for ER verification. Therefore, for conservativeness, PP have made a adjustment of the monitoring results for the whole monitoring period in accordance with para.366 of CDM VVS. According to the flow meter nameplate used for measuring the purchased gas volume on-site, the accuracy of the flow meter is 1.5%, which means the maximum permissible error of the flow meter is 1.5%. The adjustment factor is determined as 1.5%. As per the calibration reports dated 07-Dec-2023 which is after the monitoring period in consideration, the error of the flow meter is smaller than the maximum permissible error. 366 of CDM VVS for PA by adding 1.5% to the value of volumetric flow of the purchased gaseous stream. thus, the conservative value = The monitored value * (1+1.5%).

Data / Parameter	$T_{GE,m}$
Data unit	°C
Description	Temperature in the exhaust gas of the enclosed flare in the

	minute m												
Description of measurement methods and procedures to be applied	Measured by thermocouple installed at the monitoring port of the enclosed flare												
Monitoring/Reporting frequency	Monitoring continuously and recording monthly												
Value applied	633-721 degrees Celsius												
Comments	The temperature in the exhaust gas of the enclosed flare in the minute m was measured by a thermocouple continuously. The flare operated within the manufacturer's operating specification, which is no less than 600 degrees Celsius. The key information of the thermocouple installed to measure the temperature in the exhaust gas of the enclosed flare in the minute m is shown as below: <table border="1"> <tr> <td>Monitoring equipment</td><td>Thermocouple</td></tr> <tr> <td>Type</td><td>Type N</td></tr> <tr> <td>Serial No</td><td>2608-24</td></tr> <tr> <td>Accuracy</td><td>±1.0%</td></tr> <tr> <td>Calibration date</td><td>17-Oct-2022 11-Oct-2023</td></tr> <tr> <td>Validity date</td><td>16-Oct-2023 10-Oct-2024</td></tr> </table> Periodic calibration against a primary device provided by an independent accredited laboratory is mandatory for all projects applying large scale methodology(ies). Calibration should be carried out once every year according to manufacturer's specifications.	Monitoring equipment	Thermocouple	Type	Type N	Serial No	2608-24	Accuracy	±1.0%	Calibration date	17-Oct-2022 11-Oct-2023	Validity date	16-Oct-2023 10-Oct-2024
Monitoring equipment	Thermocouple												
Type	Type N												
Serial No	2608-24												
Accuracy	±1.0%												
Calibration date	17-Oct-2022 11-Oct-2023												
Validity date	16-Oct-2023 10-Oct-2024												

Means of verification	By checking the data included in the MR(version 2.1) /01/ and ER spreadsheet /02/ against the Statistic of production data covering this monitoring period/17/ to verify the Information flow. Through on-site observation, and checking the metering instruments and calibration reports to verify the monitoring method and Calibration.
Findings	The verification team has checked the data included in the MR (version 2.1) /01/ and ER spreadsheet /02/ against the Statistic of production data covering this monitoring period/17/ and can confirm that the reported monitoring data is consistent with the documented evidences, the temperature in the exhaust gas of the enclosed flare in the minute m have been verified to be reasonable. Through on-site observation and checking calibration reports/19/, the verification team confirmed that, the Thermocouple is calibrated every year by PP in accordance with the national standard. During this monitoring period, the thermocouple is calibrated by an independent accredited laboratory Shenzhen Guangce test technology Co.,Ltd.. The accuracy level of monitoring meters is same as described in the joint PD&MR /03/.

Data / Parameter	$F_{RG,m}$							
Data unit	m³/h							
Description	Flow rate of the residual gas on a dry basis at reference conditions in the minute m. This parameter is identical to parameter $V_{RG,t,db}$							
Description of measurement methods and procedures to be applied	Measured by flow meter continuously and converted automatically by the recovery monitoring system							
Frequency of monitoring/recording	Monitoring continuously and recording monthly							
Value applied	<table><tr><td>Period</td><td>Value</td></tr><tr><td>01-January-2023 to 31-January-2023</td><td>1,177</td></tr><tr><td>01-February-2023 to 28-February-2023</td><td>2,046</td></tr></table>		Period	Value	01-January-2023 to 31-January-2023	1,177	01-February-2023 to 28-February-2023	2,046
Period	Value							
01-January-2023 to 31-January-2023	1,177							
01-February-2023 to 28-February-2023	2,046							

	01-March-2023 to 31-March-2023	1,607											
	01-April-2023 to 30-April-2023	2,103											
	01-May-2023 to 31-May-2023	2,191											
	01-June-2023 to 30-June-2023	2,036											
	01-July-2023 to 31-July-2023	0											
	01-August-2023 to 31-August-2023	0											
	01-September-2023 to 30-September-2023	0											
	01-October-2023 to 31-October-2023	0											
	01-November-2023 to 30-November-2023	0											
	01-December-2023 to 31-December-2023	2,462											
Comments	As per the technical parameters for enclosed flare specified in section 3.1 of this report, the flow range of residue gas is between 450~4500m³/h, the monitored actual flow rate of residue gas is within the manufacturer’s operating specification for the flare.												
	The Flow rate of the residual gas on a dry basis at reference conditions in the minute m was measured continuously by the Flow meter installed at inlet of the flare: <table><tr><td>Monitoring equipment</td><td>Flow meter</td></tr><tr><td>Type</td><td>JF63N2</td></tr><tr><td>Serial No</td><td>18101502</td></tr><tr><td>Accuracy</td><td>0.5</td></tr><tr><td>Calibration date</td><td>29-January-2022</td></tr><tr><td>Validity date</td><td>28-January-2024</td></tr></table> Periodic calibration against a primary device provided by an independent accredited laboratory is mandatory for all projects applying large scale methodology(ies). Calibration will be carried out once every two years according to manufacturer’s specifications. Accuracy level of monitoring meters is same as described in the joint PD&MR/03/.		Monitoring equipment	Flow meter	Type	JF63N2	Serial No	18101502	Accuracy	0.5	Calibration date	29-January-2022	Validity date
Monitoring equipment	Flow meter												
Type	JF63N2												
Serial No	18101502												
Accuracy	0.5												
Calibration date	29-January-2022												
Validity date	28-January-2024												

Means of verification	By checking the data included in the MR(version 2.1) /01/ and ER spreadsheet /02/ against the Statistic of production data covering this monitoring period/17/ to verify the Information flow. Through on-site observation, and checking the metering instruments and calibration reports to verify the monitoring method and Calibration.
Findings	The verification team has checked the data included in the MR (version 2.1) /01/ and ER spreadsheet /02/ against the Statistic of production data covering this monitoring period/17/ and can confirm that the reported monitoring data is consistent with the documented evidences, the Flow rate of the residual gas on a dry basis at reference conditions in the minute m have been verified to be reasonable. Through on-site observation and checking calibration reports/19/, the verification team confirmed that, the Flow meter is calibrated every two year by PP in accordance with the national standard. During this monitoring period, the Flow meter is calibrated by an independent accredited laboratory South China National Centre of Metrology Guangdong Institute of Metrology.

Data / Parameter	Flame _m	
Data unit	Flame on/Flame off	
Description	Flame detection of flare in minute m	
Description of measurement methods and procedures to be applied	Measure using a fixed installation Infra-Red flame detector	
Frequency of monitoring/recording	Once per minute. Detection of flame recorded as a minute that the flame was on, otherwise recorded as a minute that the flame was off	
Value applied	Period	Hours of Flame on
	01-January-2023 to 31-January-2023	0.16
	01-February-2023 to 28-February-2023	0.16
	01-March-2023 to 31-March-2023	40.06

	01-April-2023 to 30-April-2023	0.50										
	01-May-2023 to 31-May-2023	16.29										
	01-June-2023 to 30-June-2023	6.38										
	01-July-2023 to 31-July-2023	0										
	01-August-2023 to 31-August-2023	0										
	01-September-2023 to 30-September-2023	0										
	01-October-2023 to 31-October-2023	0										
	01-November-2023 to 30-November-2023	0										
	01-December-2023 to 31-December-2023	18.62										
Comments	The Flame detection of flare in minute m was measured by a Infra-Red flame detector once per minute. The key information of the Infra-Red flame detector installed to measure the Flame detection of flare in minute m is shown as below: <table><tr><td>Monitoring equipment</td><td>Infra-Red flame detector</td></tr><tr><td>Type</td><td>DH-HY-IF43DA-EX</td></tr><tr><td>Serial No</td><td>19662382</td></tr><tr><td>Calibration date</td><td>17-Oct-2022</td></tr><tr><td>Validity date</td><td>16-Oct-2024</td></tr></table> Periodic calibration against a primary device provided by an independent accredited laboratory is mandatory for all projects applying large scale methodology(ies). Calibration should be carried out once every two years according to manufacturer’s specifications.		Monitoring equipment	Infra-Red flame detector	Type	DH-HY-IF43DA-EX	Serial No	19662382	Calibration date	17-Oct-2022	Validity date	16-Oct-2024
Monitoring equipment	Infra-Red flame detector											
Type	DH-HY-IF43DA-EX											
Serial No	19662382											
Calibration date	17-Oct-2022											
Validity date	16-Oct-2024											
Means of verification	By checking the data included in the MR(version 2.1) /01/ and ER spreadsheet /02/ against the Statistic of production data covering this monitoring period/17/ to verify the Information flow. Through on-site observation, and checking the metering instruments and calibration reports to verify the monitoring method and Calibration.											

Findings

The verification team has checked the data included in the MR (version 2.1) /01/ and ER spreadsheet /02/ against the Statistic of production data covering this monitoring period/17/ and can confirm that the reported monitoring data is consistent with the documented evidences, the Flame detection of flare in minute m have been verified to be reasonable.

Through on-site observation and checking calibration reports/19/, the verification team confirmed that, the metering instruments Infra-Red flame detector is calibrated every two years by PP in accordance with the national standard. During this monitoring period, the Infra-Red flame detector is calibrated by an independent accredited laboratory Shenzhen Guangce test technology Co.,Ltd..

[Calibration information]

As describe above, the accuracy and calibration frequency of the monitoring equipments have been checked and confirmed in accordance with the requirements of the monitoring plan. Calibration records have been checked by the audit team, and the following calibration information is confirmed:

Verified calibration information of monitoring meters

Monitoring equipment	Monitoring parameter	Serial Number	Type	Accuracy Class	Frequency	Calibration Date	Validity	Calibration Party
Weighbridge	Wx	22050414BD	SCS-50	III	Annually	01-January-2023	31-December-2023	Guangzhou Institute of Measurement and Testing Technology /19/
		22050413BD/ 22050415BD/ 22050416BD (Backup)				01-January-2023	31-December-2023	
Electricity meter	EC _{BL,k,y} EC _{PJ,j,y}	001800010302	DSSD71	0.5S	Annually	29-Jan-2022 18-Oct-2024	28-Jan-2023 17-Oct-2025	South China National Centre of Metrology Guangdong Institute of Metrology /19/
		001800010306	DSSD71	0.5S	Annually	29-Jan-2022 18-Oct-2024	28-Jan-2023 17-Oct-2025	South China National Centre of Metrology Guangdong Institute of Metrology /19/
Flow meter	V _{t,db,n}	2106L3546001 (before 07-Dec-2023)	ZD7200 MT5HEX	±1.5%	Once every two years	29-January-2022	28-January-2024	South China National Centre of Metrology Guangdong Institute of Metrology /19/
		18101501 (since 07-Dec-2023)	RVM- VS12 II JF63N2	±0.5%	Once every two years	18-Oct-2024	17-Oct-2026	Anzheng metrology and tset Co.Ltd./19/

Monitoring equipment	Monitoring parameter	Serial Number	Type	Accuracy Class	Frequency	Calibration Date	Validity	Calibration Party
Flow meter	$V_{RG,t,db}$	18101502	JF63N2	0.5	once every two years	29-January-2022	28-January-2024	South China National Centre of Metrology Guangdong Institute of Metrology /19/
Gas analyzer	$v_{i,t,db}$ / $v_{RG,t,db}$	62387/2	UE50	$\pm 2.5\%$	Annually	01-Jan-2022 18-Oct-2024	31-Dec-2022 17-Oct-2026	South China National Centre of Metrology Guangdong Institute of Metrology /19/ Shenzhen Guangce Test Technology Co.Ltd./19/
Flow meter	$V_{purchased,y}$	2207L4628001	ZD7200 MT3HEX	$\pm 1.5\%$	once every two years	07-Dec-2023	06-Dec-2025	Wuxi institute of inspection, testing and certification/19/

Via site view, the verification team confirmed that the installation of the electricity metering equipment fulfills the requirements of "DL/T448-2016 Technical Administrative Code of Electric Energy Metering". The accuracy should not be less than 0.5S. The installation of flow meters with accuracy of $\pm 1.5\%$ and gas analyzers with accuracy of $\pm 0.5\%$ fulfill the national standard.

Via checked the Calibration records, the verification team confirmed that in this monitoring period, the equipments are not timely calibrated by the project owner, thus the conservative deducted value added the maximum accuracy difference of the equipment is applied to calculate the emission reduction.

[Calculation of baseline GHG emissions]

➤ Baseline emissions of methane from the SWDS ($BE_{CH_4,y}$)

According to the methodology ACM0022 (version 03.0), baseline emissions are determined based on the section 4.1 of joint-PD&MR (Version 2.2). The BE_y is ex-post determined as the following equations:

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

$$= \phi_y \times (1 - f_y) \times GWP_{CH_4} \times (1 - OX) \times \frac{16}{12} \times F \times DOC_{f,y} \times MCF_y \times \sum_{x=1}^y \sum_j (W_x \times \frac{\sum_{n=1}^{Z_x} P_{n,j,x}}{Z_x} \times DOC_j \times e^{-k_j \cdot (y-x)} \times (1 - e^{-k_j}) + \sum_k (EC_{BL,k,y} - EC_{Purchased,y}) \times EF_{EL,k,y} \times (1 + TDL_{k,y})) \quad (1)$$

The electricity generated from purchased biogas ($EC_{purchased,y}$) is calculated as follows:

$$EC_{purchased,y} = V_{purchased,y} \times V_{purchased,t,db} \times \rho_{CH_4,n} \times NCV_{CH_4} \times \varphi \div 3.6 \quad (6)$$

Where,

$V_{purchased,y}$	=	Quantity of purchased biogas in year y (m3)
$V_{purchased,t,db}$	=	100% (m ³ gas CH ₄ /m ³ dry gas)
$\rho_{CH_4,n}$	=	0.71566 (kg/m3)
NCV_{CH_4}	=	0.0504 (GJ/kg)
φ	=	42%, highest power generation efficiency of biogas generator, sourced from registered VCS-JPM
3.6	=	Unit conversion from GJ to MWh

Quantity of purchased biogas ($V_{purchased,y}$) is monitored by newly installed biogas flow meter. However, the PP did not install gas analyzer to monitor the volumetric fraction of CH₄ in the purchased biogas, it is conservatively assumed that the CH₄ content in the purchased biogas is 100%, since the value of purchased biogas is deducted from total ER and higher value of $V_{purchased,y}$ will result in lower ER of the project.

By checking data sources listed in section 4.4.2 of this report, the ER calculation spreadsheet) /02/ and based on equations, parameters justified above, the fixed value $(\phi_y \times (1 - f_y) \times GWP_{CH4} \times (1 - OX) \times \frac{16}{12} \times F \times DOC_{f,y} \times MCF_y)$ is calculated as 5.712.

$\sum_{x=1}^y \sum_j (W_x \times \frac{\sum_{n=1}^{Z_x} P_{n,j,x}}{Z_x} \times DOC_j \times e^{-k_j \cdot (y-x)} \times (1 - e^{-k_j}))$ is calculated based on the monitored data and parameters, which is ex-post calculated value during this monitoring period as the follows.

Table 4-4 The ex-post calculation of $\sum_{x=1}^y \sum_j (W_x \times \frac{\sum_{n=1}^{Z_x} P_{n,j,x}}{Z_x} \times DOC_j \times e^{-k_j \cdot (y-x)} \times (1 - e^{-k_j}))$

Period (y=3)	x	Food (t)	Paper (t)	Garden and park waste (t)	Wood (t)	Others (t)	Textile (t)	Total
01-January-2023 to 31-December-2023	1	5,579.61	664.28	0.00	0.00	0.00	210.71	6,454.59
	2	11,307.17	905.70	0.00	0.00	0.00	333.07	12,545.94
	3	17,385.59	1,025.34	0.00	0.00	0.00	321.86	18,732.79
	4	18,746.20	918.39	0.00	0.00	0.00	359.16	20,023.74

By checking data sources listed in section 4.4.2 of this report and based on equations, parameters justified above, the assessment team confirmed the value of $BE_{CH4,y}$ of this monitoring period were as follows:

Table 4-5 The ex-post calculation of $BE_{CH4,y}$

Period	x	$BE_{CH4,y}$ (t CO ₂ e)
01-January-2023 to 31-December-2023	1	36,868.64
	2	71,662.41
	3	107,001.70
	4	115,117.94
Total	-	330,650

➤ Baseline emissions associated with electricity generation ($BE_{EN,t,y}$)

By checking data sources listed in section 4.4.1 of this report and based on equations, parameters justified above, the assessment team confirmed the value of $BE_{EN,t,y}$ of this monitoring period were as follows:

Table 4-6 The calculation of $BE_{EN,t,y}$ ($BE_{EC,y}$)

Period	$EC_{BL,k,y}$ (MWh)	$EF_{EL,k,y}$ (tCO ₂ /MWh)	$TDL_{k,y}$	$BE_{EN,t,y}$ ($BE_{EC,y}$) (t CO ₂ e)
01-January-2023 to 31-December-2023	10,625.281	0.50885	3%	3,477
Total	10,625.281	-	-	3,477

Therefore, baseline emission of this project activity during this monitoring period is calculated as:

Table 4-7 The ex-post calculation of BE_y

Period	$BE_{EN,t,y}$ ($BE_{EC,y}$) (t CO ₂ e)	$BE_{CH4,y}$ (t CO ₂ e)	BE_y (t CO ₂ e)
01-January-2023 to 31-December-2023	3,477	330,650	334,127
Total	3,477	330,650	334,127

Thus, the total baseline emission of the project is 334,127 tCO₂e during this monitoring period from 01-January-2023 to 31-December-2023.

[Calculation of project emissions]

According to the methodology ACM0022 (version 03.0), project emissions (PE_y) are determined based on the section 4.2 of joint-PD&MR (Version 2.2). The PE_y is ex-post determined as the following equations:

$$PE_y = PE_{AD,y} = PE_{EC,y} + PE_{CH4,y} + PE_{flare,y} \quad (2)$$

$$PE_{EC,y} = \sum_j EC_{PJ,j,y} \times EF_{EL,j,y} \times (1 + TDL_{j,y}) \quad (3)$$

$$PE_{CH4,y} = Q_{CH4,y} \times EF_{CH4,default} \times GWP_{CH4} = \frac{V_{t,db} \times v_{i,t,db} \times \rho_{i,n} \times h}{1000} \times EF_{CH4,default} \times GWP_{CH4} \quad (4)$$

$$PE_{flare,y} = GWP_{CH_4} \times (V_{t,db} \times v_{RG,t,db} \times \rho_{RG,n} \times h + V_{purchased,y} \times V_{purchased,t,db} \times \rho_{RG,n}) \times (1 - \eta_{flare,m}) \times 10^{-3} \quad (5)$$

By checking data sources listed in the ER calculation spreadsheet, section 4.4.2 of this report and based on equations, parameters above, the assessment team confirmed the value of $PE_{EC,y}$ of this monitoring period were as follows:

Table 4-8 The calculation of $PE_{EC,y}$

Period	$EC_{PJ,j,y}$ (MWh)	$EF_{EL,j,y} = EF_{grid,CM,y}$ (tCO ₂ /MWh)	$TDL_{j,y}$	$PE_{EC,y}$ (t CO ₂ e)
01-January-2023 to 31-December-2023	8,905.860	0.50885	3%	4,668
Total	8,905.860	-	-	4,668

Based on the monitored data and parameters above, $PE_{flare,y}$ and $PE_{CH_4,y}$ are ex-post calculated value during this monitoring period as the follows. $Q_{CH_4,y}$ and $F_{CH_4,RG,m}$ is shown on the monitored parameters in section 4.4.2.

Table 4-9 The calculation of $PE_{CH_4,y}$

Period	$Q_{CH_4,y}$ (t CH ₄)	$EF_{CH_4,default}$ (t CH ₄ leaked / t CH ₄ produced)	GWP_{CH_4} (tCO ₂ /tCH ₄)	$PE_{CH_4,y}$ (t CO ₂ e)
01-January-2023 to 31-December-2023	8,377	0.028	28	6,568
Total	8,377	-	-	6,568

Table 4-10 The calculation of $PE_{flare,y}$

Period	$F_{CH_4,RG,m}$ (t CH ₄)	$\eta_{flare,m}$ (%)	GWP_{CH_4} (tCO ₂ /tCH ₄)	$PE_{flare,y}$ (t CO ₂ e)
01-January-2023 to 31-December-2023	74	90	28	2,080
Total	74	-	-	2,080

Therefore, during this monitoring period from 01-January-2023 to 31-December-2023, PE_y is ex post calculated value as the following table.

Table 4-11 The ex-post calculation of PE_y

Period	$PE_{EC,y}$ (t CO ₂ e)	$PE_{flare,y}$ (t CO ₂ e)	$PE_{CH_4,y}$ (t CO ₂ e)	PE_y (t CO ₂ e)
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01-January-2023 to 31-December-2023	4,668	2,080	6,568	13,316
Total	4,668	2,080	6,568	13,316

Thus, during this monitoring period from 01-January-2023 to 31-December-2023, the total project emission of the project is 13,316 tCO₂e.

[Calculation of Leakage emissions]

As per ACM0022 (Version 03.0), leakage emissions are associated with composting/co-composting, anaerobic digestion and the use of RDF/SB that is exported outside the project boundary. And the waste by-products of the project do not involve compost or co-compost and the use of RDF/SB outside the project boundary. Leakage emissions associated with anaerobic digestion of waste (LE_{AD,y}) are calculated according to “TOOL14: Project and leakage emissions from anaerobic digesters” (Version 02.0). According to the tool, the leakage emissions associated with the anaerobic digester (LE_{AD,y}) depend on how the digestate is managed. They include emissions associated with storage and composting of the digestate. Since the solid digestate is outward transported and incinerated directly in thermal power plant and not be stored under anaerobic conditions and the wastewater is treated aerobically by wastewater treatment plant nearby during this monitoring period, leakage emission is zero, LE_y =0. Therefore, no leakage effects are accounted in this project.

[Calculation of Emission Reductions]

The verification team has confirmed that the emission reductions of the project have been conservatively calculated in line with Formula mentioned above in the emission reduction calculation spreadsheet/02/. The verification team has checked and confirmed that the emission reduction has be correctly accounted. The total calculated emission reduction in this monitoring period is as following: Verified GHG emission reductions and removals from 01-January-2023 to 31-December-2023 is shown below:

Table 4-12 Verified EG_{facility,y} during this monitoring period

Year	Baseline emissions or removals (tCO ₂ e)	Project emissions or removals (tCO ₂ e)	Leakage emissions (tCO ₂ e)	Net GHG emission reductions or removals (tCO ₂ e)
01-January-2023 to 31-December-2023	334,127	13,316	0	320,811

Total	334,127	13,316	0	320,811
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[Comparison of actual emission reductions or net anthropogenic GHG removals by sinks with estimates ex-ante]

This monitoring period is from 01-January-2023 to 31-December-2023 (Both days included), with totally 365 days. Based on the annual estimated emission reductions, the amount of emission reductions for this monitoring period would be 382,808 tCO₂e. The actual emission reductions in this monitoring period (365 days) are 320,811 tCO₂e, which is 16.20% lower than the estimation and at the normal fluctuation range. Thus, net GHG emission reduction during this monitoring period is considered to be reasonable.

Vintage period	Ex-ante estimated reductions/removals	Achieved reductions/removals	Percent difference	Explanation for the difference
01-Jan-2023 to 31-Dec-2023	382,808	320,811	-16.20%	This is the normal fluctuation range caused by the generation efficiency, temperature, waste composition, etc.
Total	382,808	320,811	-16.20%	This is the normal fluctuation range caused by the generation efficiency, temperature, waste composition, etc.

[Conclusion]

Based on the above assessment, CCSC can conclude that the emission reduction during the monitoring period from 01-January-2023 to 31-December-2023 have been quantified correctly in accordance with the project description and applied methodology /11//21//22//23//24//25//26/, and the emission reduction during this monitoring period is verified as 320,811 tCO₂e. Compared with the estimated emission reductions under the same days from 01-January-2023 to 31-December-2023 in the registered VCS-joint PD&MR /03/, 382,808 tCO₂e, the verified emission reduction is 16.20% less than the estimated value. Through checking the registered VCS-joint PD&MR and on-site interviewing with project implanter, CCSC confirms that the reason for this is the normal fluctuation range caused by generation efficiency, temperature, waste composition, etc.

CCSC is able to confirm that the actual emission reductions reported in this monitoring period are reasonable and appropriate. CCSC verified the input data for calculating emission reductions and the calculating process, and confirmed the result were complete and transparent. And CCSC is able to confirm that GHG emission reductions and removals have been quantified correctly in accordance with the monitoring plan and applied methodology for this verification period.

4.4 Quality of Evidence to Determine Reductions and Removals

As a result of verification of the ER calculation process, the verification team confirmed that all the parameters required for the determination of the emission reductions have been included in the MR /01/ and ER Calculation Spreadsheet /02/ of this monitoring period and are consistent with the applied methodology ACM0022: Alternative waste treatment processes Version 03.0 and the monitoring plan in the joint PD & MR/03/. The parameters are complete in this monitoring period.

After verifying the reported figures with the raw data sources, it's confirmed that the values of the parameters from the raw data sources are consistent with those quoted in the ER/02/ and MR/01/ of this monitoring period. The verification process for the same has been clearly described above in section 4.3 of the report.

The verification team confirmed that all measurements were performed by calibrated equipment, and the key data can be cross-checked via other sources, such as receipts and inventory data. No assumptions are used that have any material influence on reported emission reductions.

CCSC concludes that during this monitoring period, the evidences for determination of emission reductions are sufficient and reasonable, and the calculation of emission reductions is reliable.

4.5 Non-Permanence Risk Analysis

Not applicable since the project is not an AFOLU project.

5 VERIFICATION OPINION

5.1 Verification Summary

China Classification Society Certification Co., Ltd (CCSC) has been commissioned by Climate Bridge (Shanghai) Ltd. to perform the verification of the project “Guangzhou Eastern Solid Resource Recycling Center MSW Integrated Treatment Plant Project”. This verification covers the period from 01-January-2023 to 31-December-2023 with both days included.

The verification was performed based on the requirements set by VCS Standard Version 4.7 /06/, relevant UNFCCC requirements/07//08//09//10/ and ISO 14064-3: 2019, as well as criteria given to provide for consistent project operations, monitoring and reporting.

The review of the project documentation and the subsequent follow-up site visits and interviews have provided CCSC sufficient evidence to determine that the project conforms with the verification criteria for projects and their GHG emission reductions or removals set out in VCS Standard Version 4.7/06/ and has been implemented in accordance with the registered VCS-joint PD&MR /03/.

In the course of the verification, 2 Clarification Requests (CL), 1 Corrective Action Request (CAR) was raised while no forward request (FAR) was proposed. Before the issuance of this version of report, the raised CLs and CAR were successfully closed.

The verification is based on the baseline and monitoring methodology ACM0022_(v03.0)/11/, VCS-MR /01/, the VCS-joint PD&MR /03/, ER calculation spread sheet /02/ and other supporting documents available to CCSC. The project proponents are responsible for the collection, calculation and determination of the GHG data in accordance with the monitoring plan and the reporting of GHG emission reductions on the basis set out within the Monitoring Report/01/. Our verification approach was based on the requirements as defined under the applicable VCS Standard Version 4.7/2/. Our approach is risk-based, drawing on an understanding of the risks associated with reporting GHG emissions data and the controls in place to mitigate these. As the result of the verification, CCSC confirms that:

- The project has been implemented and operated as per the registered VCS-joint PD&MR /03/ and that all physical features (technology, project equipment, and monitoring and metering equipment) of the project are in place;

- The VCS-MR /01/ and other supporting documents provided are completely in accordance with the latest applicable version of the VCS Registration & Issuance Process /08/ and in accordance with the additional requirements stated by the VERRA;
- The actual monitoring systems and procedures comply with the monitoring systems and procedures described in the monitoring plan and the applied methodology ACM0022: Alternative waste treatment processes Version 03.0 /11/;
- The GHG emission reductions are calculated without material misstatements and in a conservative and appropriate manner.
- It is CCSC's responsibility to provide an independent verification statement on the reported GHG emission reductions for the project. Based on an understanding of the risks associated with reporting of GHG emission data and the controls in place to mitigate these, CCSC planned and performed our work to obtain the information and explanations that we considered necessary to provide reasonable assurance that reported GHG emission reductions are fairly stated.
- CCSC does not assume any responsibility towards the issuance and utilization of the VCU's hereby verified and certified. Request for issuance of VCUs shall be made by the project proponent to an approved VCS Program Registry based on the requirements set out under the most recent version of the VCS Program Guidelines clause on VCS Registration.
- The verification of reported emission reductions is based on the information made available to CCSC and the engagement conditions detailed in this report.

In conclusion, it is CCSC's opinion that the project "Guangzhou Eastern Solid Resource Recycling Center MSW Integrated Treatment Plant Project", in the Monitoring Report/01/ meets all relevant requirements for VCS activities and all relevant host Party criteria and in conformity with the registered VCS joint PD&MR/03/.

5.2 Verification Conclusion

Our verification approach was based on the requirements as defined under the applicable VCS standards, relevant UNFCCC requirements and ISO 14064-3: 2019. Our approach is risk-based, drawing on an understanding of the risks associated with reporting GHG emissions data and the controls in place to mitigate these. The achieved level of assurance for this verification is a reasonable level of assurance as per the requirements set out in the applied VCS Standard version 4.7 clause 4.1.10 (1).

Based on the evidence and information that are necessary to guarantee the appropriate GHG emission reductions calculation, CCSC confirms the following statement:

Verification period: From 01-January-2023 to 31-December-2023

Verified GHG emission reductions and carbon dioxide removals in the above verification period:

Vintage period	Baseline emissions (tCO ₂ e)	Project emissions (tCO ₂ e)	Leakage emissions (tCO ₂ e)	Reduction VCU _s (tCO ₂ e)	Removal VCU _s (tCO ₂ e)	Total VCU _s (tCO ₂ e)
01-Jan-2023 to 31-Dec-2023	334,127	13,316	0	320,811	0	320,811

5.3 Ex-ante vs Ex-post ERR Comparison

Vintage period	Ex-ante estimated reductions/removals	Achieved reductions/removals	Percent difference	Explanation for the difference
01-Jan-2023 to 31-Dec-2023	382,808	320,811	-16.20%	This is the normal fluctuation range caused by the generation efficiency, temperature, waste composition, etc.

APPENDIX 1: COMMERCIALLY SENSITIVE INFORMATION

Section	Information	Justification	Assessment method and conclusion
Not applicable	Not applicable	Not applicable	Not applicable

APPENDIX 2: ABBREVIATIONS

Abbreviations	Full texts
AFOLU	Agriculture, Forestry and Other Land Use
CAR	Corrective Action Request
CL	Clarification Request
FAR	Forward Action Request
CDM	Clean Development Mechanism
CCER	China Certified Emission Reductions
CCSC	China Classification Society Certification Co., Ltd.
CO ₂	Carbon dioxide
CO ₂ e	Carbon dioxide equivalent
CSPG	China South Power Grid
DOE	Designated Operation Entity
EF	Emission Factor
EIA	Environmental Impact Assessment
ETN	Electronic Transaction Notes
ER	Emission Reduction
FSR	Feasibility Study Report
GHG(s)	Greenhouse gas(es)
IPCC	Intergovernmental Panel on Climate Change
MEE	Ministry of Ecology and Environment of the People's Republic of China
MR	Monitoring Report
PD	Project Description
PP	Project Proponent
PPA	Power Purchase Agreement

PRC	post-registration change
QA/QC	Quality Assurance / Quality Control
UNFCCC	United Nations Framework Convention on Climate Change
VCS	Verified Carbon Standard
VCU	Voluntary Carbon Unit
VVB	Validation / Verification Body

APPENDIX 3: REFERENCE

Documents provided by the project participant and relevant background documents have been reviewed or referenced for the periodic verification conclusions.

Ref no.	Reference Document
/1/	Monitoring Report Version 1.0, dated 18-Sep-2024, Version 2.0, dated 18-Nov-2024, Version 2.1, dated 19-February-2025
/2/	Climate Bridge (Shanghai) Ltd., ER calculation spreadsheet, Version 1.0, dated 18-Sep-2024, Version 2.0, dated 18-Nov-2024, Version 2.1, dated 19-February-2025
/3/	Climate Bridge (Shanghai) Ltd., The VCS-Joint PD&MR version 2.1 dated 14-July-2022, version 2.2 dated 19-Feb-2025
/4/	Shenzhen CTI International Certification Co., Ltd, the joint validation and verification report V01.0 dated 15-July-2022
/5/	CCSC, the verification report V2.0 dated 24-July-2024
/6/	VERRA, VCS Standard, version 4.7
/7/	VERRA, VCS Program Guide Version 4.4
/8/	VERRA, Registration & Issuance Process Version 4.4
/9/	VERRA, Monitoring Report Template Form Version 4.4
/10/	VERRA, verification-report-template Version 4.4
/11/	ACM0022 Alternative waste treatment processes (v03.0)
/12/	Business License of Guangzhou LEO-KING Environmental Technology Co., Ltd.
/13/	Power Purchase Agreement signed by both project owner and local grid company.

/14/	Electricity invoices and Power Settlement Statement for electricity export issued by local power grid company covering the monitoring period from 01-January-2023 to 31-December-2023
/15/	Electricity invoices and Power Settlement Statement for electricity consumed by the project electricity issued by local power grid company covering the monitoring period from 01-January-2023 to 31-December-2023
/16/	Nameplates of Gas generator
/17/	Guangzhou LEO-KING Environmental Technology Co., Ltd., Statistic of production data covering this monitoring period from 01-January-2023 to 31-December-2023
/18/	Guangzhou LEO-KING Environmental Technology Co., Ltd., Summary Table of quantity and fraction of treated fresh waste covering this monitoring period from 01-January-2023 to 31-December-2023
/19/	Guangzhou Institute of Measurement and Testing Technology, Calibration Certificate of weighbridge covering this monitoring period from 01-January-2023 to 31-December-2023 South China National Centre of Metrology Guangdong Institute of Metrology, Calibration Certificate of flow meter 、 Gas analyzer covering this monitoring period from 01-January-2023 to 31-December-2023 Accreditation certificates of Guangzhou Institute of Measurement and Testing Technology and South China National Centre of Metrology Guangdong Institute of Metrology
/20/	Photos of recovery monitoring system Display Screen, flow meter, electricity meters, weighbridge, gas analyzer
/21/	am-tool-04-v8.0 Emissions from solid waste disposal sites (version 08.0)
/22/	am-tool-14-v2 Project and leakage emissions from anaerobic digesters
/23/	am-tool-03-v3 Tool to calculate project or leakage CO2 emissions from fossil fuel combustion
/24/	am-tool-05-v3.0 Baseline, project and/or leakage emissions from electricity consumption and monitoring of electricity generation
/25/	am-tool-08-v3.0 Tool to determine the mass flow of a greenhouse gas in a gaseous stream
/26/	am-tool-06-v4.0 Project emissions from flaring

/27/	am-tool-07-v7.0 Tool to calculate the emission factor for an electricity system
/28/	project management and monitoring manual
/29/	Questionnaire survey of Local Stakeholder in this monitoring period from 01-January-2023 to 31-December-2023
/30/	Employee roster, labour contracts and Payroll statement
/31/	Notice on Strengthening Enterprise Greenhouse Gas Emission Report Management
/32/	List of key emissions in the national carbon emissions transaction quota management in 2019-2020
/33/	National Enterprise Credit information Publicity System Report
/34/	No Double Counting Statement-signed
/35/	Maintenance records
/36/	training records and personnel qualification certificates
/37/	Business License of Climate Bridge (Shanghai) Ltd.
/38/	Construction Contract signed by both project owner and Shenzhen LEO-KING Environmental Technology Co., Ltd.
/39/	FSR Report
/40/	Project Approval
/41/	EIA approval
/42/	IRR calculation spreadsheet
/43/	Biogas Purchase Contracts, Biogas purchase Record and settlement notes
/44/	Supply chain (scope 3) emissions no double claiming
/45/	Notice in advance of the 3 rd verification

APPENDIX 4: RESOLUTION OF CLARIFICATION REQUESTS AND CORRECTIVE ACTION REQUESTS AND FORWARD ACTION REQUESTS

Table 1. CL from this verification

CL ID	CL-1	Section no.	2.1.2	Date: 29-Oct-2024
Description of CL				
The survey questionnaires collected from local stakeholders are not provided.				
Project participant response				Date: 18-Nov-2024
The survey questionnaires have been provided to VVB.				
Documentation provided by project participant				
30 survey questionnaires collected on 2023 from local stakeholders				
DOE assessment				Date: 18-Nov-2024
The verification team has checked newly provided survey questionnaires and the revised VCS Monitoring report accordingly,				
Thus, CL-1 is closed.				

CL ID	CL-2	Section no.	2.2.2	Date: 29-Oct-2024
Description of CL				
The record about the operation time of the generators and the flare are not provided.				
Project participant response				Date: 18-Nov-2024
PP provided the record about the operation time of the generators and the flare covering this monitoring period as evidence.				
Documentation provided by project participant				
The record about the operation time of the generators and the flare covering this				

monitoring period	
DOE assessment	Date: 18-Nov-2024
CCSC has checked the record about the operation time of the generators and the flare, it is confirmed that the record about the operation time of the generators and the flare is consistent with the updated MR. Thus, CL-2 is closed.	

Table 2. CAR from this verification

CAR ID	CAR-1	Section no.	3.1; 4.2; 5.2	Date: 29-Oct-2024
Description of CAR				
Based on the on-site inspection, PP has purchased biogas for power generation in this monitoring period. Please supplement the corresponding description and calculation in the MR, and provide the evidences and Calibration Certificate of the flow meter used to monitor the amount of purchased biogas meanwhile. The Serial No of the flow meter in the MR was not match with that on the nameplate installed at inlet of the flare verified on site. It is recommended to correct the information of flow meter in the MR.				
Project participant response				Date: 18-Nov-2024
PP provided the Biogas Purchase Contracts and biogas purchase record, and takes conservative method to re-calculate the emission reductions to ensure not to over estimate the emission reductions. PP supplemented the corresponding description and calculation in the revised MR version 2.1 and ER calculation spreadsheet version 2.1, and supplemented the revised IRR calculation spreadsheet considering the biogas purchase. PP explained that the old flow meter used for monitoring the volumetric flow of the biogas has been changed by a new one for a better accuracy on 07-Dec-2023, that information has been added to the revised MR version 2.1 and the calibration certificate that can match with the nameplate for the flow meter has been provided.				
Documentation provided by project participant				
The Biogas Purchase Contracts and biogas purchase record, the revised MR version 2.1 and ER calculation spreadsheet version 2.1, the revised IRR calculation spreadsheet.				
DOE assessment				Date: 18-Nov-2024

CCSC has checked the Biogas Purchase Contracts and biogas purchase record, the revised MR version 2.1, the revised ER calculation spreadsheet version 2.1 and the revised IRR calculation spreadsheet, it is confirmed that PP has supplemented the corresponding description and calculation in the revised MR version 2.1, the biogas purchase record is consistent with the updated MR and ER calculation spreadsheet. the revised IRR calculation spreadsheet is correct and reasonable, the calibration certificate of the flow meter newly provided can match with the nameplate.

Thus, CAR-1 is closed.

Table 3. FAR from this validation

FAR ID	N/A	Section no.	N/A	Date: N/A
Description of FAR				
N/A				
Project participant response				Date: N/A
N/A				
Documentation provided by project participant				
N/A				
DOE assessment				Date: N/A
N/A				

APPENDIX 5: COMPETENCE OF TEAM MEMBERS AND TECHNICAL REVIEWERS

CCS 认证公司

Appendix 9

CERTIFICATE OF COMPETENCE

Date of issue: 30/06/2023

Mr. Wang Guan

Has been qualified in accordance with *CDM Personnel Competence Requirements and Professional Competence Evaluation Instructions* (CDMI0301) as

- CDM validator for Technical Area(s): TA1.2/TA13.1/TA14.1
- CDM verifier for Technical Area(s): TA1.2/TA13.1/TA14.1
- ☐ Technical expert for Technical Area(s): _____



Tian Wei
CCSC General Manager

CCS 认证公司

Appendix 9

CERTIFICATE OF COMPETENCE

Date of issue: 04/01/2023

Mr. Tang Zhiang

Has been qualified in accordance with *CDM Personnel Competence Requirements and Professional Competence Evaluation Instructions* (CDMI0301) as

- CDM validator for Technical Area(s): TA1.1/TA1.2/TA.2.1/TA3.1/TA.4.1/TA9.2/TA13.1
- CDM verifier for Technical Area(s): TA1.1/TA1.2/TA.2.1/TA3.1/TA.4.1/TA9.2/TA13.1
- ☐ Technical expert for Technical Area(s): _____



Tian Wei
CCSC General Manager



Appendix 9

CERTIFICATE OF COMPETENCE

Date of issue: 04/01/2023

Ms. Piao Lijing

Has been qualified in accordance with *CDM Personnel Competence Requirements and Professional Competence Evaluation Instructions (CDMI0301)* as

- ☒ CDM validator for Technical Area(s): TA1.1/TA1.2/TA9.2
- ☒ CDM verifier for Technical Area(s): TA1.1/TA1.2/TA9.2
- ☐ Technical expert for Technical Area(s): _____



Tian Wei
CCSC General Manager