Verification and certification report form for Gold Standard project activities

BASIC INFORMATION		
Title and UNFCCC reference number of the project activity	Implementation of clean energy technology in rural areas of India-2 (GS 11656)	
Scale of the project activity	☐ Large-scale ☒ Small-scale	
Version number of the verification and certification report	04	
Completion date of the verification and certification report	23/02/2023	
Monitoring period number and duration of this monitoring period	MP1 10/06/2021 to 31/08/2022 (including both days)	
Version number of the monitoring report to which this report applies	5	
Crediting period of the project activity corresponding to this monitoring period	01/06/2021 to 31/05/2026	
Project representative(s)	Greneity Infocom Service Private Limited	
Host Party	India	
Applied methodologies and standardized baselines	AMS-I.E. Switch from non-renewable biomass for thermal applications by the user - Version 12	
Mandatory sectoral scopes	01	
Conditional sectoral scopes, if applicable	-	
Estimated amount of GHG emission reductions or GHG removals for this monitoring duration in the PDD	66,651 tCO_2e	
Certified amount of GHG emission reductions or GHG removals for this monitoring period	55,748 tCO_2e	
SDG Impacts:	SDG 13: Climate Action (13.2)	55,748 tCO_2e
	SDG 8: Decent work and Economic Growth (8.5.2)	10 permanent employments
		2 trainings per year.
	SDG 7: Affordable and Clean Energy (7.1.2)	11,085 users are accessed to clean energy source.

	SDG 3: Good health and wellbeing (3.9.1)	11,085 users have improvement in health and decrease in illness
Name and UNFCCC reference number of the DOE	E-0052: Carbon Check (India) Private Ltd.	
Name, position and signature of the approver of the verification and certification report	 Amit Anand, CEO	

SECTION A. Executive summary

>> Carbon Check (India) Private Ltd. (CCIPL) is performing the first periodic verification of the GS project "Implementation of clean energy technology in rural areas of India-2" (GS project id: GS 11656) for the period 10/06/2021-31/08/2022 (inclusive of both the dates). The project activity involves bundling of 11,085 household biogas plants in the state of Punjab, India, with capacities ranging from $4m^3$. All 11,085 plants are commissioned in between June, 2021 and January, 2022.

According to the PDD /B03/ & MR /01/, the project activity "Implementation of clean energy technology in rural areas of India-2" aims to improve health and income of India by reducing time and money spent acquiring fuel for cooking and by providing local populations with improved access to clean energy. The objective of this project activity is to replace the commonly used inefficient wood-fired mud stove technology with an efficient biogas-based cook stove that is both clean and sustainable.

This report summarises the findings of the verification of the project, performed on the basis of Gold standard for global goals (GS4GG), as well as criteria given to provide for consistent project operations, monitoring and reporting and the subsequent decisions by the Gold Standard. Verification is required for all registered GS project activities intending to confirm their achieved emission reductions and proceed with request for issuance of CERs. This report contains the findings and resolutions from the verification and a certification statement for the verified emission reductions.

Verification is the periodic independent review and ex-post determination of both quantitative and qualitative information by a Validation & verification body (VVB), of the monitored reductions in GHG emissions that have occurred as a result of the registered CDM project activity during a defined monitoring period.

Certification is the written assurance by a validation & verification body (VVB) that, during a specific period, a project activity achieved the emission reductions as verified.

The objective of this verification was to verify and certify emission reductions reported for the "Implementation of clean energy technology in rural areas of India-2" in the host country "India" for the period 10/06/2021 to 31/08/2022 (including both the days).

The purpose of verification is to review the monitoring results and verify that the monitoring methodology was implemented according to the monitoring plan and monitoring data and used to confirm the reductions in anthropogenic emissions by sources, is sufficient, definitive and presented in a concise and transparent manner. CCIPL's objective is to perform a thorough, independent assessment of the registered project activity.

In particular, the monitoring plan, monitoring report and the project's compliance with relevant GS and Host Party criteria are verified in order to confirm that the component project/s has/have been implemented in accordance with the previously registered project design and conservative assumptions, as documented. It is also confirmed if the monitoring plan is in compliance with the PDD and the approved monitoring methodology.

Scope:

The scope of the verification is:

- To verify the project implementation and operation with respect to the PDD
- To verify the implemented monitoring plan with the PDD and applied baseline and monitoring methodology.
- To verify that the actual monitoring systems and procedures are in compliance with the monitoring systems and procedures described in the monitoring plan.
- To evaluate the GHG emission reduction data and express a conclusion with a reasonable level of assurance about whether the reported GHG emission reduction data is free from material misstatement.
- To verify that reported GHG emission data is sufficiently supported by evidence.

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

Verification process:

The verification comprises a review of the monitoring report /01/ over the monitoring period from 10/06/2021 to 31/08/2022 and based on the PDD as part of the monitoring parameters and monitoring plan, emission reduction calculation spreadsheet, monitoring methodology, and all related evidence provided by project participants.

On-site interviews and inspection are also performed as part of the verification process.

Conclusion:

The verification team assigned by the validation & verification body (VVB) concludes that the monitoring report /01/, meet all relevant requirements of the Gold Standard as per the requirements of GS4GG. The verification has been conducted in-line with the GS4GG requirements.

The project activity was correctly implemented according to the selected monitoring methodology, monitoring plan and the PDD /B03/. The monitoring system was installed, maintained in a proper manner, while collected monitoring data allowed for the verification of the amount of achieved GHG emission reductions. The following table provides the resulted emission reduction from the project as verified through the document review and on-site interviews by the verification team.

Vintage	**ER (tCO_2e)**
10/06/2021 – 31/12/2021	19,883 tCO_2e
01/01/2022 – 31/09/2022	35,865 tCO_2e
Total for the monitoring period	55,748 **tCO_2e**

CCIPL as a Validation & verification body (VVB) is therefore pleased to issue a positive verification opinion expressed in the attached Certification statement.

SECTION B. Verification team, technical reviewer and approver

B.1. Verification team member

No.	Role	Type of resource	Last name	First name	Affiliation (e.g. name of central or other office of DOE or outsourced entity)	Involvement in			
						Desk/document review	On-site inspection	Interviews	Verification findings
1.	Team Leader / Local Assessor	IR	Gedam	Pallavi	CCIPL	X	X	X	X
2.	Technical Expert	IR	Singh	Vikash Kumar	CCIPL	_	X	X	_
3.	Trainee Assessor	IR	Deepak Kadam	Campal	CCIPL	X	_	X	X

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

No.	Role	Type of resource	Last name	First name	Affiliation (e.g. name of central or other office of DOE or outsourced entity)
1.	Technical reviewer	IR	C	Indumathi	CCIPL

Pallavi Gedam: She is qualified as Team Leader in TA 1.2 and 3.1 and involved in various validations and verifications under CDM, VCS and Gold Standard (GS) projects. She has also attended Several Gold Standard DOE webinar trainings including training on GS4GG. She holds a Bachelor of Science degree in Chemistry and Master of Science degree in Environmental Science from University of Mumbai. She also a qualified Lead Auditor in ISO 14001:2015 Environmental Management System. She has been involved in number of GS validation and verification projects (as trainee Assessor) GS10898 PoA (GS 10899 to GS 10921) VPA 001 to VPA 023, GS7776 PoA (GS 10716 (VPA 01), GS 916 PoA , GS5417 (VPA 12) GS 5418 (VPA 13).

Vikash Kumar Singh: Qualified lead assessor and internal technical reviewer for offset projects validations and verifications under CDM, VCS and Gold Standard (GS) and actively been involved in the validation and verification or internal technical review of more than 200 GHG offset projects. He is qualified as technical expert for TA 1.2, 3.1,4.1,13.1 and 13.2 under CDM SS categorisation. He has undergone extensive training in the validation and verification of carbon offset projects including the accreditation requirements for the VVBs. He has also received accreditation from the California Air Resources Board (ARB) under Executive Order H2-13-174 as a GHG offset lead verifier for carbon offsets projects and is a specialist for the livestock protocol. Currently, he is employed with Carbon Check in the capacity of Compliance Officer. He holds a Bachelor of Science degree in Environment & Water Management and Master of Science degree in Environmental Management. He has been involved in number of GS validation and verification projects (as internal technical reviewer and team leader) in the following Gold Standard Projects:
GS 1078, GS 1044, GS 976, GS 850, GS 916 PoA (GS 1231 (VPA 01) GS 1029 (VPA 02), GS 1030(VPA 03), GS 1031(VPA 04) and GS 4364.

Indumathi C: She is appointed Team Leader /Technical Expert for technical area TA 1.1, 1.2,3.1,13.1 & 13.2 and Technical Reviewer. She has actively been involved in the validation and verification or internal technical review of more than 200 GHG offset projects including projects with SDG component She is having more than 13 years of experience, she is certified Energy Manager, Bureau of Energy Efficiency, Govt. of India. She carried out technical reviews for climate change mitigation projects under different carbon credit mechanisms (UNFCCC, Gold Standard and Voluntary Carbon Standard) for various sectors like renewable energy (solar, wind, hydro, biomass), energy efficiency (cook stoves) and waste to energy (biogas).

Campal Kadam: - She is qualified as Trainee Assessor in TA 1.2 and 3.1. She has also attended Several Gold Standard DOE webinar trainings including training on GS4GG.

SECTION C. Means of verification

C.1. Desk/document review

>>
The verification was performed primarily based on the review of the Monitoring report /01/ and the supporting documentation. This process included review of data and information presented to verify their completeness and review of the monitoring plan and monitoring methodology. Documents reviewed or referenced during the verification are listed in Appendix 3 below.

C.2. On-site inspection

Onsite physical audit has performed from 09/09/2022 to 10/09/2022. The Team leader has conducted the on-site inspection and in particular the acceptance sampling.

VVB has conducted the sampling in line with the 'Sampling and surveys for CDM project activities and programmes of activities' version 09 and guideline 'Sampling and surveys for CDM project activities and programmes of activities' version 04 issued by UNFCCC /B04/. Where in simple random sampling approach has been adopted as all the bio digesters has common characteristics which are as follows:
1. All are same technology/model
2. Thermal energy generated is used for cooking purposes
3. Feed entered in the bio digesters is same.

Therefore, all the population involved in the project activity is homogenous in nature. Hence, CCIPL has as randomly selected samples from the database covering both the states which are representative of whole population.

Furthermore, VVB has considered the Site Visit and Remote Audit Requirements and Procedures, version 1.0/B06/ for conducting the onsite visit. In accordance with the requirements provided in the §3.1.1(b) of the Site Visit and Remote Audit Requirements and Procedures, version 1.0/B06/.

C.3. Interviews

No.	Interviewee			Date	Subject	Team member
	Last name	First name	Affiliation			
/01/	Garg	Ms.Shivani (Managing Director)	Greneity Infocom Service Private Limited	09/09/2022	• Project Design • Organisation background • Project Implementation plan • Project start date and Project Location • Project background information • Baseline surveys • Baseline Scenario • Baseline Identification and Additionality • Monitoring and reporting documentation • Qualification and Training • Quality Assurance – Management and operating system • Social and Environmental Impacts • Local Stakeholders meeting process • Compliance with relevant laws • Roles and responsibility • Observations of established practices	Pallavi gedam
/02/	Singh	Mr. Rajbir	Green Mission Welfare Society	09/09/2022	Project Implementation and operation.	Pallavi gedam
/03/	Singh	Mr. Harpreet	RET (Renewable Energy Technician) and Local stakeholder	09/09/2022	Monitoring Surveys	Pallavi gedam
/04/	Sharma	Mr. Arjun	Greneity Infocom Service	09/09/2022	Commissioning details, agreement with project developers, functioning of	Pallavi gedam

			Private Limited		biogas systems, sustainability issues, baseline fuel, Post project benefits, Impact on health and livelihood, Monitoring Surveys, Maintenance, grievance system, field visit etc.	
/06/	Singh	Mr. Jung	Households	09/09/2022	Commissioning details, agreement with project developers, functioning of biogas systems, sustainability issues, baseline fuel, Post project benefits, Impact on health and livelihood, Monitoring Surveys, Maintenance, grievance system, field visit etc.	Pallavi gedam
/07/	Singh	Mr. Netar	Households	09/09/2022		Pallavi gedam
/08/	Singh	Mr. Pyara	Households	09/09/2022		Pallavi gedam
/09/	Singh	Mr. Charn	Households	09/09/2022		Pallavi gedam
/10/	Singh	Mr. Darshan	Households	10/09/2022		Pallavi gedam
/11/	Singh	Mr. Sher	Households	10/09/2022		Pallavi gedam
/12/	Singh	Mr. Gurmail	Households	10/09/2022		Pallavi gedam
/13/	Singh	Mr. Jang	Households	10/09/2022		Pallavi gedam
/14/	Singh	Mr. Jangir	Households	10/09/2022		Pallavi gedam
/15/	Singh	Mr. Gurjeet	Households	10/09/2022		Pallavi gedam
/16/	Singh	Mr. Kartar	Households	10/09/2022		Pallavi gedam

C.4. Sampling approach

As the target population is homogeneous, PP has proposed simple random sampling plan using 90/10 as confidence/precision. This is in line with the applied methodology /B03/. The sample size for each parameter is determined following guidelines for Sampling and Surveys for CDM Project activities and Programme of Activities Ver. 4.0 (EB86, Annex 4) /B04/.

In line with paragraph 26 of the Sampling Standard, the verification team has applied acceptance sampling approach through on-site interviews on the monitoring survey as part of verification. The project participant had applied sampling approach to the monitoring survey /10/, conducted by the representatives of project participant. The verification team has chosen acceptance sampling in accordance with paragraph 28 of the sampling standard /B04/.

Applying paragraph 39 (c) of the sampling standard, version 09 /B04/, a sample size of 11 households was chosen (with no discrepant records). A sample size of 11 was determined, based on an AQL of 0.5% and UQL of 20%; producer risk and consumer risk of 10 % each in determining the DOE's sample size Acceptance number (c) thus determined for the sample is 0. However, DOE interviewed 11 samples from the monitoring survey done by project participants.

The information provided in the monitoring survey /10/, has been cross checked during the Onsite visit. As a part of acceptance sampling, the Verification team could confirm the monitoring survey data /10/ with no discrepant records. Thus, PP's set of records has been accepted in line with § 33 of the sampling standard, version 09 /B04/.

Parameter	Verification approach	Population (for DOE's sample)	DOE's Sample Size
Usage & monitoring surveys	ASP	300	11

The details of the sample interviewed are listed in section C.3 (under the list of interviewed persons). No discrepancy was found in any of the 11 samples and thus c=0, i.e., no discrepant records were observed. Thus, PP's set of records has been accepted in line with §33 of the sampling standard (version 09.0) /B04/. For the impact parameters, questionnaire was prepared and was used during the survey by the PP. During the on-site interviews, the verification team cross-checked these sample documents, and no discrepancies were found in the impact parameters as well. Furthermore, the training & competency of the personnel, who conducted such test were checked. They were also interviewed to ensure that the process, method used, and their competency to confirm such standardised test were appropriately applied. The sampling technique to draw such samples were found adequate and the sample collectors were found competent to perform such task.

C.5. Clarification requests (CLs), corrective action requests (CARs) and forward action requests (FARs) raised

The VVB has raised 05 clarifications (CLs) and 02 corrective action requests (CARs) and satisfactorily closed.

SECTION D. Verification findings

D.1. Remaining forward action requests from validation and/or previous verifications

>>
N/A

D.2. Compliance of the project implementation and operation with the registered project design document

Means of verification	Document Review, Interview
Findings	CAR 01 was raised and resolved successfully. Please refer Appendix 4 below.
Conclusion	Verification team confirms that the latest available version of the monitoring report template has been used and the MR is in compliance with the monitoring report form and related monitoring report template guide. As verified from on-site interview and third-party survey report /10/, the audit team confirm the project implementation and operation complies with the project design document /B03/. The starting date of project activity is 01/06/2021 (Purchased order released) which is confirmed from the PDD /B03/ and validation report /B03/. The Project activity involves bundling of 11,085 plants installed in rural areas of Punjab installed between June 2021 and January 2022 constructed & maintained by Green Mission Welfare Society. The project boundary in the PDD /B03/ is in line with the actual project boundary. 11,085 household biogas systems are employed for the project activity, which results in 39.72 $MW_{thermal}$, further, annual emission reduction is less than 60,000 tCO_2e. Therefore, VVB concludes that the project activity is within threshold of small-scale project. CCIPL confirms that the project biogas systems are operational through on-site visits and interviews with end users. Each biogas system has a unique identification number that was provided in the end user agreement and are correct according to the project database. Each biogas plant is also physically marked with its unique identification number. Along with the serial number, the biogas technology, end user name, address, commissioning date etc. had also been noted which were found to be consistent on ground. It is noted that no changes have been observed or identified, that may impact the

	additionality. No addition of component nor extension of technology, no addition nor removal of project sites, no change of values of the actual operational parameter relevant to determination of emission reductions which are within the control of the PP; no change has been observed or identified that may impact the scale of the project activity or applicability of baseline and monitoring methodology AMS-I.E version 12 /B01/. The operational status of all project bio-digesters, impact on identified SDGs from 10/06/2021 to 31/08/2022 has been taken into consideration. Verification team based on review of MR /01/ and provided evidence confirms that the households/end users relinquish their right of carbon credits. Verification team has verified the end user agreement /05/ and commissioning certificates /21/ states the rights transfer in the lieu of free operation and maintenance of the plant. Furthermore, the bio digester plant implemented under the project is uniquely identified, thus avoiding any potential double counting. PP has ensured each of the bio digesters have their UID on them, which will prevent any kind of double counting. Further, it has been observed that same districts with same size of bio digesters are not repeated in the different projects. This was confirmed during the validation and verification site visits undertaken by VVB. Further, PP has provided an undertaking that same project is not developed under any other carbon scheme /20/. As verified through document review and on-site interviews, the project implementation and operation, all physical features of the project complies with the project design document /B03/. Verification team has checked the information in the monitoring report /01/ and compared it against the PDD /B03/ and found to be consistent. Verification team confirms that: a) The project activity is implemented as per PDD/B03/. b) The actual operation of the proposed CDM project activity is in line with the PDD /B03/. c) It has reviewed the PDD /B03/ including the monitoring plan, the applied monitoring methodology and found that the final MR/01/ for this monitoring period is in line with all the above-mentioned documents. Verification team of CCIPL based on review of records and on-site interviews confirms that a robust and effective grievance addressal mechanism is in place and however, no grievances were reported during the monitoring period. In summary, the monitoring period is reasonable, and the operation of the project activity is in accordance with the PDD /B03/.

D.3. Post-registration changes

D.3.1. Temporary deviations from the registered monitoring plan, applied methodologies, standardized baselines or other methodological regulatory documents[1]

>> Not applicable

D.3.2. Corrections

>>
Not applicable

[1] Other standards, methodologies, methodological tools and guidelines (to be) applied in accordance with the applied(selected) methodologies are collectively referred to as the other (applied) methodological regulatory documents).

D.3.3. Changes to the start date of the crediting period

>>
Not applicable

D.3.4. Inclusion of a monitoring plan

>>
Not applicable

D.3.5. Permanent changes from registered monitoring plan, or permanent deviation of monitoring from the applied methodologies, standardized baselines or other methodological regulatory documents

>>
Not applicable

D.3.6. Changes to the project design

>>
Not applicable

D.3.7. Changes specific to afforestation and reforestation project activities

>>
Not applicable

D.4. Compliance of the registered monitoring plan with applied methodologies, applied standardized baselines, and other applied methodological regulatory documents

Means of verification	Document Review, Interview
Findings	-
Conclusion	The verification team has checked the actual monitoring plan against the registered monitoring plan and monitoring methodology and applicable tools. Furthermore, the verification team has checked monitoring system by means of comparison with the information given in the monitoring plan and monitoring methodology. The monitoring plan is completely in accordance with the approved methodology /B01/ applied by the PDD/B03/.

D.5. Compliance of monitoring activities with the registered monitoring plan

D.5.1. Data and parameters fixed ex ante or at renewal of crediting period

Means of verification	Document Review, Interview
Findings	--
Conclusion	The following ex-ante parameters are considered in the calculation of the emission reductions:

Parameter	Value	Assessment
Fraction of woody biomass saved by the project activity during year y that can be established as non-renewable biomass ($f_{NRB,y}$) in percentage.	Punjab-95.61%	f_{NRB} is calculated as per tool to calculate the fraction of non-renewable biomass and fixed for the entire crediting period as per the PDD /B03/.
Average annual consumption of woody biomass per household before the start of the project activity ($BC_{BL,HH,y}$) in tonne/household/year	Punjab-5.38	The baseline fire-wood consumption is as per third party survey report and fixed for the entire crediting period as per the PDD /B03/.
Net calorific value of the non-renewable woody	0.0156	Net Calorific Value of the wood used as cooking fuel. Default

	biomass that is substituted (NCVbiomass) in TJ/Tonne		value as per the applied methodology /B01/.
	Emission factor for the substitution of non-renewable woody biomass by similar Consumers (EFprojected_fossilfuel) in tCO2/TJ	64.4	Emission factor for the substitution of non-renewable biomass by similar consumers. Default value as per the applied methodology /B01/.
	Leakage adjustment factor (Ly) (fraction)	0.95	Net to gross Adjustment Factor. Default value as per the applied methodology /B01/.
	Number of households (biogas system) in the project activity (N_{HH})**	11,085	The parameter is fixed for the project activity and the project database with commissioning dates are submitted to Sustain Cert /08/.
	** The project activity includes 11,085 household bio digesters in the state of Punjab. The project activity is a retroactive project, wherein all the biogas digesters are fully implemented and operational. Further, PP has fixed this parameter ex-ante. However, the operational rate will be monitored ex-post. No further addition of biogas plants are envisaged related to the project activity. Verification team confirms that the data and parameters fixed ex ante are in compliance with the PDD /B03/ and monitoring plan. Please refer to the Annex 1 for assessment of each parameter.		

D.5.2. Data and parameters monitored

Means of verification	Document Review, Interview
Findings	CL 05 was raised and resolved successfully. Please refer Appendix 4 below.
Conclusion	The verification team confirms that the data and parameters monitored are in compliance with the PDD /B03/ and the monitoring plan.

Parameter	Value	Assessment
Average annual consumption of woody biomass per household in the pre-project devices during the project activity, if it is found that pre-project devices were not Completely displaced but continue to be used to some extent ($BC_{PJ,HH,y}$) tonne/household/year	Punjab-0.073	A third-party survey by EEMG, Bhopal was carried out to estimate the usage of firewood after the installation of the biogas plants. Survey was conducted in 05/05/2022 to 15/06/2022 assess the above parameter in accordance to the Guidelines for sampling and surveys for CDM project activities and programmes of activities (Ver04.0, CDM-EB67-A06-GUID) issued by UNFCCC was used. Total 300 samples were surveyed. As per the survey report /10/ it was found in Punjab 4% of the sample population, used firewood for 5 days in a year. The average value among the reported users are taken conservatively for

		entire population. VVB during on-site visit the same has been confirmed. Therefore, the value as per survey report reported in ER sheet is considered correct.
Number of households (biogas system) in the project activity in operational per year ($N_{HH,y}$)	11,085	The parameter is monitored through third party (EEMG, Bhopal) survey /10/. The survey identified sampled households as per UNFCCC guideline. As per survey results, out total 300 samples were surveyed all the samples were found in operation on the time of survey. Therefore, the effective number of biogas systems in operation during the monitoring period is 11,085 (100%).
SDG 3 – (Good health and well-being) Improvement in health and decrease in illness	11,085	Improvement in health and decrease in illness will be assessed through interview with end users due to project implementation. Users opinion on indoor air quality due to biogas usage shall be collected during monitoring survey conducted by EEMG Bhopal from 05/05/2022 to 15/06/2022. As per the survey 100% users give a positive response on improvement in health. The verification team during on-site audit has interviewed the biogas uses and the over results were confirmed.
SDG 7 – (Affordable and clean energy) Access to affordable and clean energy services	11,085	The parameter is monitored through third party (EEMG, Bhopal) survey /10/. The survey identified sampled households as per UNFCCC guideline. As per survey results, out total 300 samples were surveyed all the biogas plants were found operation at the time of survey. The verification team during on-site audit all the samples were operational. Therefore, PP's monitoring result is accepted.

PP has maintained monitoring service records; grievance register and operations logbook. No grievance has been raised during the monitoring period. However, only minor operational issues were raised by the users; however, all the issues

	were rectified with-in maximum 24 hours. There were no issues related to non-usage of biogas units. It is confirmed that the verification team assessed the data / information flow from the point of monitoring to emission reduction calculation and found no gap in the same. Please refer to the Annex 4 for assessment of each parameter

D.5.3. Implementation of sampling plan

Means of verification	Document Review, Interview
Findings	CL 01 was raised and resolved successfully. Please refer Appendix 4 below.
Conclusion	A third-party survey by EEMG, Bhopal was carried out /10/, survey was conducted between 05/05/2022 to 15/06/2022. According to the standard for sampling and survey /B04/ and related guidelines /B04/ the sampling plan was determined at the time of project registration and applied during the monitoring. Sampling method: Simple random sampling method is adopted as the target population is homogeneous. The sample size is determined by the requirement to achieve 90/10 precision, in line with the methodology for annual survey. Sampling approaches may follow the Guideline "Sampling and surveys for CDM project activities and programme of activities" for calculation of sample size. Data to be collected: Number of project devices of type i and operating in year y. Implementation plan: Annual or biennial. Actual implementation: - Sampling method: The sample size included all households and was randomly sampled from a list of all the project biogas system in the project for each state separately. The target population is the 11,085 during the monitoring period. The sampling frame is homogenous within itself, with respect to service level, established ex-ante baseline and user characteristics. PP has determined target sample number to be 178 as below: The total sample size has been derived using equation para 12 of appendix 1, EB 86 Annex 4, Guidelines for Sampling and Surveys for CDM Project activities and Programme of Activities Ver. 4.0. /B04/. The expected parameter values (mean, standard deviation and proportion) have been taken as per para 12 of appendix 1, EB 86 Annex 4 /B04/. Total Population (N) is 11,085 expected proportion is taken 60% and accordingly, sample size (n) come out to be 178.

D.6. Compliance with the calibration frequency requirements for measuring instruments

Means of verification	Document Review, Interview
Findings	-
Conclusion	N/A since there is no monitoring equipment which require calibration as per the monitoring plan. The equipment's used for the monitoring consists of reviewing the documents and on-site interviews.

D.7. Assessment of data and calculation of emission reductions or net removals

D.7.1. Calculation of baseline GHG emissions or baseline net GHG removals by sinks

Means of verification	Document Review, Interview
Findings	CAR 02, CL 02 and CL 03 has been raised and resolved successfully. Please refer Appendix 4 below.
Conclusion	As per the PDD /B03/ and the Methodology applied /B01/, Baseline emission reductions are calculated as per equation 1 of the methodology as below: $BEy = By * f_{NRB}, y * NCVbiomass * EFprojected\_fossilfuel$ Where, **BEy** = Baseline Emissions during the year y in tCO_2e **By** = Quantity of woody biomass that is substituted or displaced in tonnes

$f_{NRB,y}$ = Fraction of woody biomass used in the absence of the project activity in year y that can be established as non-renewable biomass, using survey methods or government data or approved default country specific fraction of non-renewable woody biomass (fNRB) values available on the CDM website. In this case fNRB, y is fixed ex-ante to be Punjab verified from PDD and validation report /B03/.
The fraction of non-renewable biomass for Punjab is 95.61% .

Assessment of $f_{NRBi,y}$

PP has calculated the f_{NRB} as per CDM Methodological Tool: "Calculation of fraction of non- renewable biomass" (v03.0). Validation team confirms that it has checked f_{NRB} calculation spread sheet prepared as prepared by PP.

As per the applied methodological tool, In the case of ex ante calculation of $f_{NRB,}$ the parameter f_{NRB} shall be estimated using the most recent historical year for which data is available. Review of f_{NRB} calculation revealed that all the data used for the calculation is latest available data at the time of validation.

Review of f_{NRB} spread sheet prepared by PP reveals that the estimation of domestic consumption was derived from the following table and the data sources were verified as a part of validation:

Description of indicators	units	Total quantity	reference
Total woodfuel consumption (HW*N+CE)	Ton/year	456000	India State of Forest Resources 2019, volume 1, chapter 10, pg 160, table 10.2
Annual wood consumption as timber for other use (NE)	Ton/year	**3682554.334**	value calculated by using section 7.4.7 (Annual fuelwood consumption)India State of Forest Resources 2011, chapter no 7

The total woody biomass consumption for Punjab as per the f_{NRB} calculation by PP is estimated to be **4138554.334** t/yr, which is deemed appropriate to the VVB.

PP has correctly calculated the renewable biomass by using the following equation of the tool:

$$RB = \sum (MAI_{forest,i} \times (F_{forest,i} - P_{forest})) + \sum (MAI_{other,i} \times (F_{other,i} - P_{other}))$$

The Mean Annual Increment of woody biomass growth per hectare in subcategory i of forest areas (t/ha/yr) and other areas is considered as 0.695 for Punjab. This parameter has been taken from the published paper "Phytomass carbon pool of trees and forests in India[2]; checked and confirmed by the VVB. The extent of forest in sub-category i (ha) **(Fforest,i) and Extent of Other Wooded Land (Fother,i)** have been taken from India State of Forest Resources 2021, chapter 13, page no. 427, the verified value for these parameters are 253,000 ha and 8,000 ha respectively. Extent of non-accessible area (e.g. protected area where extraction of wood is prohibited, geographically remote area) within forest areas (ha) is taken 0 (it's a area under tiger reserve and in Punjab there is no such area. The extent of non-accessible area (e.g. protected area where extraction of wood is prohibited, geographically remote area) within other wooded land areas (ha) is optional as per the tool and not considered by the PP and the same is deemed acceptable to the VVB.

[2] https://moef.gov.in/wp-content/uploads/2019/06/Pacific.pdf (page no. 16 of Asia-Pacific Forestry Sector Outlook Study II India Outlook Study 2020)

	The difference between woody biomass consumption (**4138554.334** t/yr) and renewable biomass (**181395** t/yr) is considered to be non-renewable i.e. 3957159 t/yr. Non-renewable biomass utilisation in Punjab is, therefore, validated as . 3957159 t/yr. The fraction of non-renewable biomass is the quotient of the non-renewable and the total biomass. The fraction of non-renewable biomass for Punjab is, therefore, accepted as 95.61% **NCVbiomass** = Net calorific value of the non-renewable woody biomass that is substituted (IPCC default for wood fuel, 0.0156 TJ/tonne) **EFprojected_fossilfuel** = Emission factor for the substitution of non-renewable woody biomass by similar consumers. Use a value of 64.4 tCO_2/TJ. '**By**' By is determined by using option (a) paragraph 27 of the methodology as follows: "Calculated as the product of the number of households multiplied by the estimate of average annual consumption of woody biomass per household that is displaced by the project activity (tonnes/ household/year)"; $B_y = N_{HH} \times (BC_{BL,HH,y} - BC_{PJ,HH,y})$ Where, N_{HH} = Number of households in the project activity, number $BC_{BL,,y}$ = Average annual consumption of woody biomass per household before the start of the project activity, tonnes/household/year $BC_{PJ,HH,y}$ = If it is found that pre-project devices were not completely displaced but continue to be used to some extent, average annual consumption of woody biomass per household in the pre-project devices during the project activity, tonnes/household/year $BC_{BL,HH,y}$ = for the project has been considered based on the survey To estimate $BC_{PJ,HH,y}$ a third-party survey by EEMG, Bhopal was carried out to estimate the usage of firewood after the installation of the biogas plants. Survey was conducted in 05/05/2022 to 15/06/2022 to assess the above parameter in accordance to the Guidelines for sampling and surveys for CDM project activities and programmes of activities (Ver04.0, CDM-EB67-A06-GUID) issued by UNFCCC was used. Total 300 samples were surveyed. As per the survey report /10/ it was found in Punjab 4% used firewood for 5 days in a year. The average value among the reported users are taken conservatively for entire population. VVB during on-site visit the same has been confirmed. Therefore, the value as per survey report reported in ER sheet is considered correct. The average annual consumption of woody biomass is estimated by survey methods to be 32.67 tonne/year which is 0.073 tonnes/household/year. The average annual consumption of woody biomass is estimated by survey methods to be 32.67 tonne in case of Punjab, as per the MR /01/, /02/. The baseline emissions (without leakage) is calculated as 58,682 tCO2e. Accordingly, the emission reductions for project activity for the monitoring period from 10/06/2021 to 31/08/2022 is calculated to be 55,748 tCO2e. VVB based on review of emission reduction spread sheet and commissioning certificates of individual biogas units (in batches) and confirms that PP has considered the commissioning of the last (in a batch) biogas digester, as start date to account the number of days for baseline emission calculation. This approach is a conservative approach and thus acceptable to the VVB.

D.7.2. Calculation of project GHG emissions or actual net anthropogenic GHG removals by sinks

Means of verification	Document Review, Interview

Findings	--
Conclusion	Project Emissions (PEy): As per applied methodology AMS-I.E, version 12, project emissions are accounted for below activities: - CO2 emissions from on-site consumption of fossil fuels due to the project activity - CO2 emissions from electricity consumption by the project activity - Methane emission from solid waste disposal or waste water - Project emissions related to cultivation of feedstock - Project emissions from transportation The project activity does not involve any of the above activity and hence, project emissions for the project activity is not applicable. However, while determining By as per equation 3 of the applied methodology, firewood consumed by pre-project devices during the project activity shall be monitored and applied ex-post. Project emissions are already accounted appropriately as per the applied formula for baseline emissions calculations as discussed in above section D.7.1. Emission reductions: The final emission reduction after applying the leakage factor has been verified to be correct ERy= 55,748 tCO_2e

D.7.3. Calculation of leakage GHG emissions

Means of verification	Document Review, Interview
Findings	-
Conclusion	According to the PDD /B03/, a leakage assessment is only required every two years; however, such a leakage and thus assessment is required for this monitoring period. **<u>Project Leakage Assessment</u>** Ex post surveys of users and the areas from which this woody biomass is sourced will be used to assess leakage emissions. The following potential leakage sources must be considered: non-project households/users who previously used renewable energy sources use/divert non-renewable woody biomass saved under the project activity. If the leakage assessment identifies an increase in the use of non-renewable woody biomass by non-project households/users that is attributable to project activity, By is adjusted to account for the quantified leakage. To account for leakages, By is multiplied by a net to gross adjustment factor of 0.95, in which case surveys are not required. PP has opted default option, and By is adjusted with adjustment factor of 0.95 to account leakage. Therefore, the net benefit is = 58,682 * 0.95 = **55,748** tCO2e As per the demonstration in the PDD /B03/ and MR /01/, the adjustment factor of 0.95 has been accounted for leakage for the monitoring period.

D.7.4. Summary calculation of GHG emission reductions or net anthropogenic GHG removals by sinks

Means of verification	Document Review, Interview
Findings	-
Conclusion	Emission Reductions: The emission reductions in this monitoring period are: $ER_y = BE_y - PE_y - LE_y$

	Where, ER_y is the total emission reductions of the project activity during the year y in tCO_2e; BE_y is the baseline emissions for the project activity during the year y in tCO_2e; PE_y is the emissions for the project activity during the year y in tCO_2e; LE_y is the leakage emissions for the project activity during the year y in tCO_2e. As explained in section D.7.1 above, the resulted Baseline emissions (BEy) for the monitoring period is **58,682** tCO_2e. Similarly, as explained in section D.7.2 project emissions are accounted appropriately as per the applied formula for baseline emissions calculations and leakage emisisons are accounted to be 2934 tCO_2 for the monitoring period. Hence, resulted emission reduction for the monitoring period is 55,748tCO_2e (roundown value).

D.7.5. Comparison of actual GHG emission reductions or net anthropogenic GHG removals by sinks with estimates in PDD

Means of verification	Document Review, Interview
Findings	CAR 03 has been raised and resolved successfully. Please refer Appendix 4 below.
Conclusion	The ex-ante estimate value of the emission reductions for the monitoring period as per the PDD /B03/ is 66,651 tCO_2e and the actual emission reductions achieved for the monitoring period is 55,748 tCO_2e.

SDG	Values estimated in ex ante calculation of approved PDD	Actual values achieved during this monitoring period
13	66,651	55,748 tCO2e
8	Expected 10 permanent employments	10 permanent employments
8	Expected 2 trainings per year.	2 trainings per year.
7	11,085 users are expected to have access to clean energy source.	11,085 users are accessed to clean energy source.
3	11,085 biogas plant users expected to have improvement in health and decrease in illness	11,085 biogas plant users have improvement in health and decrease in illness

Improvement in health and decrease in illness are assessed through interview with end users, due to project implementation. Users' opinion on indoor air quality due to biogas usage collected during monitoring survey/10/ conducted by third party as per UNFCCC guideline from 05/05/2022 to 15/06/2022. As per the survey 100% users give a positive response on improvement in health. The sample survey forms and results were verified by the verification team. The verification team during on-site audit has interviewed the biogas user and the results were confirmed.

Access to affordable and clean energy services is monitored through third party survey /10/. The survey identified sampled households as per UNFCCC guideline. As per survey results, out total 300 samples were surveyed all the biogas plants were found operation at the time of survey. The verification team during on-site audit all the samples were operational. Therefore, PP's monitoring result is accepted.

The emission reduction calculations provided in the spreadsheet /02/ have been

	verified to be correct and in line with the PDD /B03/.

D.7.6. Remarks on difference from estimated value in PDD

Means of verification	Document Review, Interview
Findings	--
Conclusion	The ex-ante estimate value of the emission reductions for the monitoring period as per the PDD /B03/ is 66,651 tCO_2e and the actual emission reductions achieved for the monitoring period is 55,748 tCO_2e. For SDG 13, since actual emission reduction is lower than the estimated value and hence it is acceptable to the verification team. The monitoring report /01/ provides reason for decrease in the actual emission reduction and the same was confirmed by the verification team by interviewing the representatives of PP and by reviewing the actual implementation status of the project. For other SDG parameters, the actual values are same as those estimated in the PDD. •

SECTION E. Internal quality control

>>
The verification report passed a technical review before being submitted to the Gold Standard. The technical review is performed by a technical reviewer qualified in accordance with CCIPL's qualification scheme for CDM validation and verification.

SECTION F. Verification/Certification opinion

>>
Carbon Check (India) Private Ltd. (CCIPL) has performed the 1st periodic verification of the registered GS Project Activity "Implementation of clean energy technology in rural areas of India-2 (GS 11656)".

The verification team assigned by the VVB concludes that the project activity as described in the PDD /B03/ and the Monitoring report /01/, meets all relevant requirements of the Gold Standard. The verification has been conducted in-line with the GS4GG requirements project activities.

Verification methodology and process

The Verification team confirms the contractual relationship signed /14/ between the VVB, Carbon Check (India) Private Ltd. and the Project Participant. The team assigned to the verification meets the CCIPL's internal procedures including the UNFCCC/GS requirements for the team composition and competence. The verification team has conducted a thorough contract review as per UNFCCC and CCIPL's procedures and requirements.

The verification has been performed as per the requirements described in the GS4GG and constitutes the review and completion of the following steps:

- Reviewing the PDD /B03/, including the monitoring plan and the corresponding validation report /B03/;
- Desk review of the MR /01/ and other relevant documents including documents related to the project activities in emission reductions;
- Review of the applied monitoring methodology AMS-I.E. Switch from non-renewable biomass for thermal applications by the user - Version 12 /B01/;
- On-site inspection (09/09/2022 to 10/09/2022)
- Resolution of CARs and CLs raised during verification
- Issuance of Verification Report

The project activity was correctly implemented according to selected monitoring methodology, monitoring plan and the PDD. The monitoring system was installed, maintained in a proper manner, while collected monitoring data allowed for the verification of the amount of achieved GHG emission reductions. Through the document review and remote interviews, the verification team confirms that the project activity has resulted in the 55,748 tCO_2e emission reductions during the reported monitoring period.

This statement covers verification period from 10/06/2021 to 31/08/2022 (including both the dates).

The VVB has raised 05 clarifications and 02 corrective action requests, all of which are satisfactorily closed.

The VVB considers necessary to give reasonable assurance that reported GHG emission reductions were calculated correctly on the basis of the approved baseline and monitoring methodology and the monitoring plan contained in the PDD are fairly stated.

The VVB, hereby certifies that the project activity, achieved emission reductions by sources of GHG equal to 55,748 tCO_2e equivalent and all monitoring requirements have been fulfilled and is substantiated by an audit trail that contains evidence and records.

Appendix 1. Abbreviations

Abbreviations	Full texts
BE	Baseline Emissions
CA	Corrective Action/ Clarification Action
CER	Certified Emission Reduction
CAR	Corrective Action Request
CCIPL	Carbon Check (India) Private Ltd.
CDM	Clean Development Mechanism
CH_4	Methane
CL	Clarification Request
CO_2	Carbon Dioxide
CO_{2e}	Carbon Dioxide Equivalent
DVR	Draft Verification Report
EB	CDM Executive Board
EF	Emission Factor
FA	Final Approval
FAR	Forward Action Request
FVR	Final Validation Report
GHG	Greenhouse gas(es)
GWh	Giga Watt Hour
GWP	Global Warming Potential
IPCC	Intergovernmental Panel on Climate Change
LE	Leakage Emissions
MP	Monitoring Period
MR	Monitoring Report
MWh	Mega Watt Hour
OSV	On Site Visit
PE	Project Emissions
PP(s)	Project Participant(s)
PRC	Post registration change
QC/QA	Quality Control/ Quality Assurance
TA	Technical Area
TR	Technical Review
UNFCCC	United Nations Framework Convention on Climate Change
VVS	Validation and Verification Standard
VVB	Validation & verification body

Appendix 2. Competence of team members and technical reviewers

Carbon CHECK

Carbon Check (India) Private Ltd.

Ms. Pallavi Gedam

has been qualified as per CCIPL's internal qualification procedures, in accordance with requirements of Accreditation Standard (version 07.0):

For following functions:

Validator	☒	**Team Leader**	☒	**Technical reviewer**	☐		
Verifier	☒	**Technical Expert**	☒	**Local Assessor**[1]	☒		

In the following Technical Areas:

TA 1.1	☐	**TA 4.1**	☐	**TA 9.1**	☐	**TA 13.1**	☐
TA 1.2	☒	**TA 5.1**	☐	**TA 9.2**	☐	**TA 13.2**	☐
TA 3.1	☒	**TA 5.2**	☐	**TA 10.1**	☐	**TA 14.1**	☐

Mr. Vikash Kumar Singh
Compliance Officer

Mr. Amit Anand
CEO

Date of Approval
29/11/2021

Valid Till
28/11/2022

Revision History of the Document

01/03/2020[2]	Interim Revision for office address change
01/09/2020	Interim Revision for CCIPL logo change
24/12/2020	Annual Revision
29/11/2021	Revision in response to qualification as Team Leader and Technical Expert

[1] India

[2] Please refer to previous version of competency certificates for the revision history.

CARBON CHECK (INDIA) PRIVATE LIMITED
CIN: U74930DL2012PTC232495
Regd. Off: 2071/38, 2nd Floor, Naiwala, Karol Bagh, New Delhi - 110005
Corporate off: Unit No. 1701, Logix City Centre Office Tower, Plot No. BW-58, Sector-32 Noida, Uttar Pradesh
Tel: +91 120 4373114 | **URL:** www.carboncheck.co.in | **e-mail:** info@carboncheck.co.in

Carbon CHECK

Carbon Check (India) Private Ltd.

Vikash Kumar Singh

has been qualified as per CCIPL's internal qualification procedures, in accordance with requirements of Accreditation Standard (version 07.0):

For following functions:

Validator	☒	**Team Leader**	☒	**Technical reviewer**	☒
Verifier	☒	**Technical Expert**	☒	**Local Assessor**[1]	☒

In the following Technical Areas:

TA 1.1	☒	**TA 4.1**	☒	**TA 9.1**	☐	**TA 13.1**	☒
TA 1.2	☒	**TA 5.1**	☐	**TA 9.2**	☐	**TA 13.2**	☒
TA 3.1	☒	**TA 5.2**	☐	**TA 10.1**	☐	**TA 14.1**	☐

Mr. Amit Anand
CEO

Date of Approval	**Valid Till**
24/12/2021	23/12/2022

Revision History of the Document

01/03/2020[2]	Interim Revision for office address change
01/09/2020	Interim Revision for CCIPL logo change
24/12/2020	Annual Revision
24/12/2021	Annual Revision

[1] India, South Africa, Spanish speaking countries

[2] Please refer to previous version of competency certificates for the revision history.

CARBON CHECK (INDIA) PRIVATE LIMITED
CIN: U74930DL2012PTC232495
Regd. Off: 2071/38, 2nd Floor, Naiwala, Karol Bagh, New Delhi - 110005
Corporate off: Unit No. 1701, Logix City Centre Office Tower, Plot No. BW-58, Sector-32 Noida, Uttar Pradesh
Tel: +91 120 4373114 | **URL:** www.carboncheck.co.in | **e-mail:** info@carboncheck.co.in

Carbon CHECK

Carbon Check (India) Private Ltd.

Ms. Indumathi. C

has been qualified as per CCIPL's internal qualification procedures, in accordance with requirements of Accreditation Standard (version 07.0):

For following functions:

Validator	☐	**Team Leader**	☒	**Technical reviewer**	☒
Verifier	☐	**Technical Expert**	☒	**Local Assessor**[1]	☒

In the following Technical Areas:

TA 1.1	☒	**TA 4.1**	☐	**TA 9.1**	☐	**TA 13.1**	☒
TA 1.2	☒	**TA 5.1**	☐	**TA 9.2**	☐	**TA 13.2**	☒
TA 3.1	☒	**TA 5.2**	☐	**TA 10.1**	☐	**TA 14.1**	☐

Mr. Vikash Kumar Singh
Compliance Officer

Mr. Amit Anand
CEO

Date of Approval
24/12/2021

Valid Till
23/12/2022

Revision History of the Document

01/03/2020[2]	Interim Revision for office address change
01/09/2020	Interim Revision for CCIPL logo change
24/12/2020	Annual Revision
24/12/2021	Annual Revision

[1] India.

[2] Please refer to previous version of competency certificates for the revision history.

CARBON CHECK (INDIA) PRIVATE LIMITED
CIN: U74930DL2012PTC232495
Regd. Off: 2071/38, 2nd Floor, Naiwala, Karol Bagh, New Delhi - 110005
Corporate off: Unit No. 1701, Logix City Centre Office Tower, Plot No. BW-58, Sector-32 Noida, Uttar Pradesh
Tel: +91 120 4373114 | **URL:** www.carboncheck.co.in | **e-mail:** info@carboncheck.co.in

Appendix 3. Documents reviewed or referenced

S. No.	Document
/01/	a) Monitoring report, version 01, Dated: - 02/07/2022 b) Monitoring report, version 02, dated :- 02/08/2022 c) Monitoring report, version 03, dated :- 17/12/2022 d) Monitoring report, version 04, dated :- 20/01/2023 e) Monitoring report, version 05 dated :- 22/02/2023
/02/	• Emission reduction calculation spread sheet corresponding to /01-a/ • Emission reduction calculation spread sheet corresponding to /01-b/ • Emission reduction calculation spread sheet corresponding to /01-c/ • Emission reduction calculation spread sheet corresponding to /01-d/ • Emission reduction calculation spread sheet corresponding to /01-e/
/03/	Distribution records including sample sales receipt
/04/	Evidence for the biodigester specifications distributed under the project
/05/	Evidence of Carbon Credits waiver/end user agreement
/06/	Evidence for the random sample generator for the parameters opted for sampling/survey.
/07/	Initial Sample size calculation sheet along with actual samples conducted and the reliability assessment.
/08/	Evidence for unique identification number under the project
/09/	Records of monitoring Survey of the project and Biogas user survey
/10/	Third party survey report
/11/	Employment records: a) Permanent Employment records b) Contractual Employment records
/12/	The grievance register applicable for the monitoring period
/13/	Monitoring log books
/14/	Verification contract between VVB & PP
/15/	Biogas Service Records
/16/	Training records: a) Summer b) Winter
/17/	Salary slips: a) Permanent Employee b) Contractual Employee
/18/	Monitoring Survey Forms
/19/	Contract between PP and third party for monitoring survey
/20/	Undertaking provided by PP to ensure no double counting related to the project activity.
/21/	Commissioning certificates of bio digesters

Background Documents

Ref no.	Reference Document

/B01/	AMS-I.E. Switch from non-renewable biomass for thermal applications by the user - Version 12
/B02/	Community Services Activity Requirements (version 1.1) under GS4GG https://globalgoals.goldstandard.org/200-gs4gg-community-services-activity-requirements/
/B03/	PDD, Version 4 and corresponding Validation Report
/B04/	Standards a) CDM Sampling Standard, version 09.0 b) Guidelines for Sampling and Surveys for CDM Project activities and Programme of Activities Ver. 4.0. c) CDM validation and verification standard for project activities, version 04.0
/B05/	IPCC 2006, volume 2, chapter 1
/B06/	Site Visit and Remote Audit Requirements and Procedures, version 1.0

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

CAR ID	01	Section no.	MR	Date: 19/09/2022
Description of CAR				
PP to clearly mention the monitoring period in the Monitoring report.				
PP response				Date20/09/2022:
Pp has mentioned the same in MR version 02				
Documentation provided by PP				
DOE assessment				Date: 11/10/2022
PP has provided the revised MR, which has been verified by the verification team. Hence this CAR is closed.				

CAR ID	02	Section no.	MR	Date: 19/09/2022
Description of CAR				
Emission reduction achieved during the monitoring period is inconsistent through out the monitoring report, Also the number of biogas plant installed is inconsistent with the emission reduction sheet and database.				
PP response				Date: 20/09/2022
MR version 02 has been revised. ERs are now consistent in all the documents				
Documentation provided by PP				
DOE assessment				Date: 11/10/2022
PP has provided the revised MR, which has been verified by the verification team. Hence this CAR is closed.				

CL ID	01	Section no.	MR	Date: 19/09/2022
Description of CAR				
PP has used the sampling standard version 08. Moreover PP while calculating sample size uses the household population of 6468, while it bis observed that the actual biogas installed is more than 10,000. PP to clarify, whether this inconsistency effects the monitoring sample size of the project.				
PP response				Date: 20/09/2022
MR version 02 has been revised.				
Documentation provided by PP				
DOE assessment				Date: 11/10/2022
PP has provided the revised MR, which has been verified by the verification team. Hence this CL is closed.				

CL ID	02	Section no.	MR	Date: 19/09/2022
Description of CAR				
Baseline calculated value is inconsistent with in the monitoring report and emission reduction sheet.				
PP response				Date: 20/09/2022
MR version 02 has been revised				
Documentation provided by PP				
DOE assessment				Date: 11/10/2022
PP has provided the revised MR, which has been verified by the verification team. Hence this CL is closed.				

CL ID	03	Section no.	MR	Date: 19/09/2022
Description of CAR				
Under section E.5.1 , PP has mentioned "*As per registered PDD*....." . Moreover, the monitoring period covers 21 months, but the emission reduction sheet covers 17 months. PP to clarify on the same.				
PP response				Date: 20/09/2022
Section E.5.1 of the MR version 02 has been revised				
Documentation provided by PP				
DOE assessment				Date: 11/10/2022
PP has provided the revised MR, which has been verified by the verification team. Hence this CL is closed.				

CL ID	04	Section no.	MR	Date: 19/09/2022
Description of CAR				
In section E.2 of the monitoring report, PP to clarify on the SDG Impacts and indicators proposed.				
PP response				Date: 20/09/2022
Section E.2 of the MR version 02 has been revised				
Documentation provided by PP				
DOE assessment				Date: 11/10/2022
PP has provided the revised MR, which has been verified by the verification team. Hence this CL is closed.				

CL ID	05	Section no.	MR	Date: 19/09/2022
Description of CAR				
In section D.2 of the monitoring report, values of all the monitoring parameters have not been mentioned. PP to clarify the same				
PP response				Date: 20/09/2022
Section D.2. of the MR version 02 has been revised				
Documentation provided by PP				
DOE assessment				Date: 11/10/2022
PP has provided the revised MR, which has been verified by the verification team. Hence this CL is closed.				

1. FARs from this verification.

FAR ID		Section no.		Date:
Description of CL				
PP response				Date:
Documentation provided by PP				
DOE assessment				Date:

Annex 1: Assessment of data and parameters fixed ex-ante at the time of validation

Relevant SDG Indicator	SDG 13, Climate action
Parameter	N_{HH}
Data unit	Number
Default values used	11,085
Purpose of data	Estimation of Baseline
Source of verification of the source	Project Proponent's project database

Relevant SDG Indicator	SDG 13, Climate action
Parameter	$BC_{BL,HH,y}$
Data unit	tonnes/household/year
Default values used	5.38
Purpose of data	Estimation of Baseline
Source of verification of the source	Baseline survey

Relevant SDG Indicator	SDG 13, Climate action
Parameter	$f_{NRB,y}$
Data unit	Percentage
Default values used	95.61%
Purpose of data	Estimation of Baseline
Source of verification of the source	Calculated

Relevant SDG Indicator	SDG 13, Climate action
Parameter	NCVbiomass
Data unit	TJ/tonne
Default values used	0.0156
Purpose of data	Calculation of Baseline emissions
Source of verification of the source	IPCC default value for wood/B05/

Relevant SDG Indicator	SDG 13, Climate action
Parameter	$EFprojected_fossilfue$l
Data unit	tCO_2/TJ
Default values used	64.4 tCO2/TJ
Purpose of data	Estimation of Baseline
Source of verification of the source	Default value from the methodology, AMS-I.E

Annex 2: Assessment of data and parameters monitored

Monitoring Parameter Requirement	Assessment/ Observation by the VVB
Data / Parameter: (As in monitoring plan of GS PD):	Average annual consumption of woody biomass per household in the pre-project devices during the project activity, if it is found that pre-project devices were not completely displaced but continue to be used to some extent. ($BC_{PJ,HH,y}$)
Measuring frequency/Time Interval:	At least once in every two years.
Reporting frequency:	At least once in every two years.
Reported value:	0.073 t/household/year
Is measuring and reporting frequency in accordance with the monitoring plan and monitoring methodology? (Yes / No)	Yes
Details of monitoring equipment:	Value obtained from monitoring survey of samples /09/
Is accuracy of the monitoring equipment as stated in the VCS PD? If the VCS PD does not specify the accuracy of the monitoring equipment, does the monitoring equipment represent good monitoring practise?	NA
Calibration frequency /interval: Is it monitoring methodology /CDM EB guidance / local or national standards / manufacturers specification	NA
Is the calibration interval in line with the monitoring plan of the VCS PD? If the VCS PD does not specify the frequency of calibration, does the selected frequency represent good monitoring practise?	NA. QA/QC procedures stated in MR comply with PDD /B03/
Company performing the calibration(internal or external calibration):	NA
Did calibration confirm proper functioning of monitoring equipment? (Yes / No):	NA
Is (are) calibration(s) valid for the whole	NA

reporting period?	
If applicable, has the reported data been cross-checked with other available data?	Yes, the reported data in MR has been compared with monitoring survey records /09/ and the ER sheet /02/.
How were the values in the monitoring report verified?	NA
Does the data management (from data generation to emission reduction calculation) ensure correct transfer of data and reporting of emission reductions and are necessary QA/QC processes in place?	Yes, the data management ensures correct transfer of data and reporting of emission reductions and all necessary QA/QC processes are in place.
In case only partial data are available because activity levels or non-activity parameters have not been monitored in accordance with the registered monitoring plan, has the most conservative assumption theoretically possible been applied or has a request for deviation been approved?	NA

Monitoring Parameter Requirement	Assessment/ Observation by the VVB
Data / Parameter: (as in monitoring plan of VCS PD):	Number of households (biogas system) in the project activity in operational per year (N_{HH})
Measuring frequency/Time Interval:	At least once in every two years.
Reporting frequency:	At least once in every two years.
Reported value:	11,085
Is measuring and reporting frequency in accordance with the monitoring plan and monitoring methodology? (Yes / No)	Yes
Details of monitoring equipment:	Value obtained from Project Proponent's project database.
Is accuracy of the monitoring equipment as stated in the VCS PD? If the VCS PD does not specify the accuracy of the monitoring equipment, does the monitoring equipment represent good monitoring practise?	NA
Calibration frequency /interval: Is it monitoring methodology /CDM EB guidance / local or national standards / manufacturers specification	NA
Is the calibration interval in line with the monitoring plan of the VCS PD? If the VCS PD does not specify the frequency of calibration, does the selected frequency represent good monitoring practise?	NA. QA/QC procedures stated in MR comply with PDD /B03/
Company performing the calibration(internal or external calibration):	NA
Did calibration confirm proper functioning of monitoring equipment? (Yes / No):	NA
Is (are) calibration(s) valid for the whole reporting period?	NA
If applicable, has the reported data been cross-checked with other available data?	Yes, the reported data in MR has been compared with monitoring survey records /09/ and the ER sheet /02/.
How were the values in the monitoring report verified?	NA
Does the data management (from data generation to emission reduction calculation) ensure correct transfer of data and reporting of emission reductions and are necessary	Yes, the data management ensures correct transfer of data and reporting of emission reductions and all necessary QA/QC processes are in place.

QA/QC processes in place?	
In case only partial data are available because activity levels or non-activity parameters have not been monitored in accordance with the registered monitoring plan, has the most conservative assumption theoretically possible been applied or has a request for deviation been approved?	NA

Monitoring Parameter Requirement	Assessment/ Observation by the VVB
Data / Parameter: (as in monitoring plan of VCS PD):	Unemployment rate, by sex, age and persons with disabilities (SDG 8)
Measuring frequency/Time Interval:	Annual
Reporting frequency:	Annual
Reported value:	2
Is measuring and reporting frequency in accordance with the monitoring plan and monitoring methodology? (Yes / No)	Yes
Details of monitoring equipment:	Value obtained from records of training programme /16/
Is accuracy of the monitoring equipment as stated in the VCS PD? If the VCS PD does not specify the accuracy of the monitoring equipment, does the monitoring equipment represent good monitoring practise?	NA
Calibration frequency /interval: Is it monitoring methodology /CDM EB guidance / local or national standards / manufacturers specification	NA
Is the calibration interval in line with the monitoring plan of the VCS PD? If the VCS PD does not specify the frequency of calibration, does the selected frequency represent good monitoring practise?	NA. QA/QC procedures stated in MR comply with PDD /B03/
Company performing the calibration(internal or external calibration):	NA
Did calibration confirm proper functioning of monitoring equipment? (Yes / No):	NA
Is (are) calibration(s) valid for the whole reporting period?	NA
If applicable, has the reported data been cross-checked with other available data?	Yes, the reported data in MR has been compared with records of training /16/ and the ER sheet /02/.
How were the values in the monitoring report verified?	NA
Does the data management (from data generation to emission reduction calculation) ensure correct transfer of data and reporting of emission reductions and are necessary QA/QC processes in place?	Yes, the data management ensures correct transfer of data and reporting of emission reductions and all necessary QA/QC processes are in place.
In case only partial data are available because activity levels or non-activity parameters have not been monitored in accordance with the registered monitoring plan, has the most conservative assumption theoretically possible been applied or has a request for deviation been approved?	NA

Monitoring Parameter Requirement	Assessment/ Observation by the VVB
Data / Parameter: (as in monitoring plan of VCS PD):	Quantitative employment and income generation (8.5.2)
Measuring frequency/Time Interval:	Annual
Reporting frequency:	Annual
Reported value:	10 permanent employments
Is measuring and reporting frequency in accordance with the monitoring plan and monitoring methodology? (Yes / No)	Yes
Details of monitoring equipment:	Value obtained from employment records /11/
Is accuracy of the monitoring equipment as stated in the VCS PD? If the VCS PD does not specify the accuracy of the monitoring equipment, does the monitoring equipment represent good monitoring practise?	NA
Calibration frequency /interval: Is it monitoring methodology /CDM EB guidance / local or national standards / manufacturers specification	NA
Is the calibration interval in line with the monitoring plan of the VCS PD? If the VCS PD does not specify the frequency of calibration, does the selected frequency represent good monitoring practise?	NA. QA/QC procedures stated in MR comply with PDD /B03/
Company performing the calibration(internal or external calibration):	NA
Did calibration confirm proper functioning of monitoring equipment? (Yes / No):	NA
Is (are) calibration(s) valid for the whole reporting period?	NA
If applicable, has the reported data been cross-checked with other available data?	Yes, the reported data in MR has been compared with employment records /11/ and the ER sheet /02/.
How were the values in the monitoring report verified?	NA
Does the data management (from data generation to emission reduction calculation) ensure correct transfer of data and reporting of emission reductions and are necessary QA/QC processes in place?	Yes, the data management ensures correct transfer of data and reporting of emission reductions and all necessary QA/QC processes are in place.
In case only partial data are available because activity levels or non-activity parameters have not been monitored in accordance with the registered monitoring plan, has the most conservative assumption theoretically possible been applied or has a request for deviation been approved?	NA

Monitoring Parameter Requirement	Assessment/ Observation by the VVB
Data / Parameter: (as in monitoring plan of VCS PD):	Access to affordable and clean energy services (7.1.2)
Measuring frequency/Time Interval:	At least once in two years
Reporting frequency:	At least once in two years
Reported value:	11,085
Is measuring and reporting frequency in accordance with the monitoring plan and monitoring methodology? (Yes / No)	Yes

Details of monitoring equipment:	Value obtained from Biogas user survey /09/
Is accuracy of the monitoring equipment as stated in the VCS PD? If the VCS PD does not specify the accuracy of the monitoring equipment, does the monitoring equipment represent good monitoring practise?	NA
Calibration frequency /interval: Is it monitoring methodology /CDM EB guidance / local or national standards / manufacturers specification	NA
Is the calibration interval in line with the monitoring plan of the VCS PD? If the VCS PD does not specify the frequency of calibration, does the selected frequency represent good monitoring practise?	NA. QA/QC procedures stated in MR comply with PDD /B03/
Company performing the calibration(internal or external calibration):	NA
Did calibration confirm proper functioning of monitoring equipment? (Yes / No):	NA
Is (are) calibration(s) valid for the whole reporting period?	NA
If applicable, has the reported data been cross-checked with other available data?	Yes, the reported data in MR has been compared with monitoring survey /09/ and the ER sheet /02/.
How were the values in the monitoring report verified?	NA
Does the data management (from data generation to emission reduction calculation) ensure correct transfer of data and reporting of emission reductions and are necessary QA/QC processes in place?	Yes, the data management ensures correct transfer of data and reporting of emission reductions and all necessary QA/QC processes are in place.
In case only partial data are available because activity levels or non-activity parameters have not been monitored in accordance with the registered monitoring plan, has the most conservative assumption theoretically possible been applied or has a request for deviation been approved?	NA

Monitoring Parameter Requirement	**Assessment/ Observation by the VVB**
Data / Parameter: (as in monitoring plan of VCS PD):	Improvement in health and decrease in illness (3.9.1)
Measuring frequency/Time Interval:	At least once in two years
Reporting frequency:	At least once in two years
Reported value:	11,085
Is measuring and reporting frequency in accordance with the monitoring plan and monitoring methodology? (Yes / No)	Yes
Details of monitoring equipment:	Value obtained from Biogas user survey /09/
Is accuracy of the monitoring equipment as stated in the VCS PD? If the VCS PD does not specify the accuracy of the monitoring	NA

equipment, does the monitoring equipment represent good monitoring practise?	
Calibration frequency /interval: Is it monitoring methodology /CDM EB guidance / local or national standards / manufacturers specification	NA
Is the calibration interval in line with the monitoring plan of the VCS PD? If the VCS PD does not specify the frequency of calibration, does the selected frequency represent good monitoring practise?	NA. QA/QC procedures stated in MR comply with PDD /B03/
Company performing the calibration(internal or external calibration):	NA
Did calibration confirm proper functioning of monitoring equipment? (Yes / No):	NA
Is (are) calibration(s) valid for the whole reporting period?	NA
If applicable, has the reported data been cross-checked with other available data?	Yes, the reported data in MR has been compared with monitoring survey /09/ and the ER sheet /02/.
How were the values in the monitoring report verified?	NA
Does the data management (from data generation to emission reduction calculation) ensure correct transfer of data and reporting of emission reductions and are necessary QA/QC processes in place?	Yes, the data management ensures correct transfer of data and reporting of emission reductions and all necessary QA/QC processes are in place.
In case only partial data are available because activity levels or non-activity parameters have not been monitored in accordance with the registered monitoring plan, has the most conservative assumption theoretically possible been applied or has a request for deviation been approved?	NA