



VALIDATION REPORT

For the renewal of crediting period (RCP) of GS-CDM
Component Project Activity

“Nepal Biogas Support Program – CPA 02: 19,927
digesters” (GS Ref no. 3113)

UNDER PoA

“Nepal Biogas Support Program – PoA”
(GS REF. No. 3110)

REPORT No.
GS.21.VAL.002



Date of this issue: 06/07/2021		KBS Ref. No.: GS.21.VAL.002	
Organizational Unit:		Client:	
Climate Change Division, KBS		Alternative Energy Promotion Centre (AEPC)	
GS CPA-DD			
PoA Title	Nepal Biogas Support Program - PoA (GS Ref. No. 3110)		
CPA Title	Nepal Biogas Support Program - CPA 2: 19,927 digesters (GS Ref. No. 3113)		
GS Version	Gold Standard for Global Goals (GS4GG)		
Methodology	AMS.I.E. Switch from Non-Renewable Biomass for Thermal Applications by the User, Version 9.0		
Summary of validation:			
'Alternative Energy Promotion Centre (AEPC)' has commissioned KBS Certification Services Pvt. Ltd. to perform the RCP of the proposed GS CDM CPA titled: "Nepal Biogas Support Program – CPA 2: 19,927 digesters" under PoA titled "Nepal Biogas Support Program - PoA". The CPA involves implementation of biogas applications at individual household in Nepal. These applications displace firewood with biogas from animal waste and human excreta. The biogas is used as a fuel for cooking. The scope of the validation is defined as an independent and objective review of the VPA design document, the project's baseline study and monitoring plan and other relevant documents. The information in these documents is reviewed against the GS4GG Principle & Requirements, version 1.2. The report is based on the assessment of the GS PoA-DD, CPA-DD undertaken through stakeholder consultations, application of standard auditing techniques including but not limited to desk review, follow up actions (e.g., remote monitoring, electronic (telephone or e-mail) interviews) and the review of the applicable GS4GG requirements. The review of the project design documentation and the subsequent follow-up interviews have provided KBS with sufficient evidence to determine the project's fulfillment of all the stated criteria. In our opinion, the CPA meets all applicable requirements of Gold Standard for Global Goals. - ☒ Will be recommended to the Gold Standard with a request for registration - ☐ Is not recommended for registration			
Validation Status:		☐ Findings not closed	
Project type:	Small scale	☐ Draft validation report	
Subject: Gold Standard Validation- RCP		☒ Final validation report	
Validation Team:		Document Distribution	
Team Leader and technical expert 13.1: Deboshmita Dey Technical expert 1.1: Sanjay Kandari Local Expert: Sujana Adhikari Validator-Trainee: Ananya Malik		☒ No Distribution without permission from the Client ☐ Limited Distribution	
Technical Review Team:	Manager - Technical & Certification		
Technical Reviewer: Tushar Chaudhari Technical Expert (TA 13.1, 1.1): Tushar Chaudhari	Name: Tushar Chaudhari		
Authorized by:			
Name: Kaushal Goyal, Managing Director		☐ Unrestricted Distribution	



Rev Number:	Date:	
0	28/04/2021	
1	04/05/2021	
2	06/07/2021	



Abbreviations

AMS	Approved Methodology for Small-scale
BE	Baseline Emissions
CAR	Corrective Action Request
CDM	Clean Development Mechanism
CME	Coordinating management/entity
CER	Certified Emission Reduction
CL	Clarification request
COP	Conference of Parties
CPA-DD	Component Project Activity Design Document
DNA	Designated National Authority
DR	Document Review
EB	Executive Board
EF	Emission Factor
ERs	Emission Reductions
FAR	Forward Action Request
FSR	Feasibility Study Report
GHG	Greenhouse gas(es)
GS4GG	Gold Standard for Global Goals
HCA	Host Country Approval
IPCC	Intergovernmental Panel on Climate Change
KP	Kyoto Protocol
LSC	Local Stakeholder Consultation
LE	Leakage Emissions
MOP	Meeting of Parties
MoC	Modalities of Communication
MP	Monitoring Plan
PoA	Programme of Activity
PE	Project Emissions
PS	Project Standard
PCP	Project Cycle Procedure
QA/QC	Quality Assurance/Quality Control
RfR	Request for Registration
SD	Sustainable Development
T&C	Technical & Certification
UNFCCC	United Nations Framework Convention on Climate Change
VVB	Validation & Verification Body
VVS	Validation & Verification Standard



Table of Content

1. Validation Opinion	6
2. Introduction	7
2.1 Objective	7
2.2 Scope	7
3. Methodology	8
3.1 Review of CDM PoA-DD and Additional Documentation	8
3.2 Site Visit	8
3.3 Major Milestones in validation	11
3.4 Use of the Validation Protocol	11
3.5 Findings	12
3.6 Internal Quality Control	12
4. Validation Findings	13
4.1 Project Description	13
4.2 Contribution to Sustainable Development Goals	13
4.3 Baseline and monitoring methodology and Standardized baseline	14
4.4 Application of Monitoring Methodology	21
5. Safeguarding Principles Assessment	28
6. Environmental Impacts	31
7. Local Stakeholder Comments	31
8. Grievance Mechanism	32
9. References	32



1. Validation Opinion

KBS Certification Services Pvt. Ltd. has been contracted by 'Alternative Energy Promotion Centre (AEPC)' to perform a RCP validation of the CPA:

CPA Title: Nepal Biogas Support Program – CPA 2: 19,927 digesters (GS Ref. No. 3113)

PoA Title: Nepal Biogas Support Program – PoA (GS Ref. No. 3110)

Host Party: Nepal

The RCP validation was performed in accordance with the applicable Gold Standard for Global goals guidance, Version 1.2 and host country criteria, as well as criteria given to provide for consistent project operations, monitoring and reporting.

The proposed GS CPA will result in reductions of greenhouse gas (GHG) emissions that are real, measurable and give long-term benefits to the mitigation of climate change. In our opinion, the project meets all relevant Gold Standards, CDM criteria and all relevant host country criteria.

The GS CPA correctly applies CDM methodology: "AMS.I.E. Switch from Non-Renewable Biomass for Thermal Applications by the User, Version 9.0". It is demonstrated that the GS CPA is not a likely baseline scenario. The emission reductions attributable to the GS CPA are hence additional to any that would occur in the absence of the GS CPA.

The total emission reductions from the project are estimated to be 64,868 tCO₂e on annual basis over 7 years crediting period. The emission reduction forecast has been checked and it is deemed likely that the stated amount is achievable given the underlying assumptions do not change.

The GS CPA is recommended by KBS for request for renewal of crediting period with the Gold Standard.

Authorized Signatory

Signature:

Name: Kaushal Goyal

Place: Faridabad, India

Date: 06/07/2021



2. Introduction

2.1 Objective

'Alternative Energy Promotion Centre (AEPC)' has commissioned KBS Certification Services Pvt. Ltd. to perform the RCP validation of the CPA with

CPA Title: Nepal Biogas Support Program – CPA 2: 19,927 digesters (GS Ref. No. 3113)

PoA title: Nepal Biogas Support Program – PoA (GS Ref. No. 3110)

The RCP validation is with regard to the relevant requirements for GS4GG Principles & Requirements, version 1.2/21/.

The purpose of RCP validation is to ensure a thorough, independent assessment of proposed GS CPA against the applicable Gold standard requirements, Version 1.2.

In particular, the project's current baseline, the monitoring plan (MP) and the project's compliance with relevant UNFCCC and host country criteria are validated in order to confirm that the project design as documented is sound and reasonable and meets the stated requirements and identified criteria. The validation is seen as necessary to provide assurance to stakeholders of the quality of the project and its intended generation of GS, carbon emission reduction (GS CER).

UNFCCC criteria refer to the Kyoto Protocol criteria and the CDM rules and modalities and related decisions by the COP/MOP and the CDM Executive Board also used apart the GS criteria.

2.2 Scope

The scope of the RCP validation is defined as an independent and objective review of the revised CPA-DD, the project's baseline study and monitoring plan and other relevant documents. The information in these documents is reviewed against Kyoto Protocol requirements, UNFCCC rules and associated interpretations, Gold Standard requirements. KBS has employed a rule-based approach in the RCP validation, focusing on the identification of significant risks for project implementation and the generation of GS CERs.

The report is based on the assessment of the Component project activity design document, application of standard auditing techniques including but not limited to desk review, follow up actions (e.g., electronic (telephone or e-mail) interviews) and also the review of the applicable approved methodological and relevant tools and GS4GG guidance. This report summarizes the findings from the validation of the updated CPA-DD of the CPA, performed on the basis of GS4GG requirements and included an assessment of: (a) The impact of new relevant national and/or sectoral policies and circumstances on the baseline taking into account relevant guidance from the Board with regard to renewal of the crediting period at the time of requesting renewal of crediting period; (b) The correctness of the application of an approved baseline methodology for the determination of the continued validity of the baseline or its update, and the estimation of emission reductions from the applicable crediting period. This validation opinion is also to be seen in conjunction with the validation report at the time of requesting registration for the first crediting period. The Validation Opinion is not meant to provide any consultancy towards the CME. However, stated requests for clarifications and/or corrective actions may have provided input for improvement of the project design.

3. Methodology

3.1 *Review of CDM PoA-DD and Additional Documentation*

The RCP validation is performed primarily as a document review of the CPA Design Documents (CPA-DD). The assessment is performed by a validation team using a validation protocol. The cross checks between information provided in the CPA-DD and information from sources other than those used, if available, the validation team's sectoral or local expertise and, if necessary, independent background investigations.

3.2 *Site Visit*

As a result of the COVID-19 pandemic, taking into account the rules of relevant national and local authorities (local to the VVB offices as well as to locality of the site visits), World Health Organization (WHO) recommendations, policies of the VVB and other relevant travel restrictions and guidance (for example, a requirement to self-isolate upon return from specific countries), the VVB has skipped the on-site visit. However as per the COVID 19 Interim Measures by GS4GG, the VVB may use alternative measures for auditing like remote audits.

As per para 4.1.1 (b) of COVID 19 Interim Measures/21/, Validation team has used the following alternative means for its assessment and to justify that they are sufficient for the purpose of validation of the CPA. Along with desk review, audit team has conducted remote audit interview corresponding to the CPA as follows:

- A complete desk review of the submitted CPA-DD (initial and final versions), as well as all applicable country legal requirement and supportive evidences have been checked by the validation team.
- Validation team has performed Microsoft teams application interview with CME in order to check implementation, current situation, management system of the CPA, project technology, location, training provided, start date etc.
- Interview questions were filled as per Validation team interview checklist and also videos conferencing was done to check implementation of the CPA, project technology, baseline of CPA etc. Total 11 bio digester owners were inspected through video conferencing and interviewed in order to assess the baseline appliance and usage of biogas in the baseline and project case for CPA.
- Cross-check evaluation, for information received from interviews, under the scope of all information and references provided in the CPA-DD and supporting documents.

Details of interviewees, topics covered and additional information presented below:

No.	Interviewee			Date	Subject	Team member
	Last name	First name	Affiliation			
1	Pokhrel	Prem Kumar	Climate and Carbon Financing Expert, AEPC	15/03/2021	- Roles and responsibilities - Focal point for the proposed GS CPA - End user agreement - Technical details - Project feasibility, designing, project life time - Monitoring of ER parameters - Sustainable development issues - SDG parameter monitoring, - Stakeholder consultation process (SFR), - ODA source if any. - Baseline assessment - Issues in the CPA-DD - ER estimation - LSC meeting - Opinion about the project regarding the sustainable development. - Verification of safeguarding principle assessment - Checking the awareness of end-user agreement terms.	Deboshmita Dey (Team Leader & TA Expert 13.1), Sanjay Kandari (TA expert 1.1), Ananya Malik (Verifier-trainee)
2	Mahato	Sita Ram	Biodigester owner, Bagmati Province, Chitwan, Nepal	14/04/2021 - 17/04/2021	Project implementation, Baseline, Commissioning of digester, Mode of distribution, SFR etc.	Local Expert: Sujan Adhikari
3	MAHATO	BIKANA	Biodigester owner, Bagmati Province, Chitwan, Nepal			
4	SHRESTHA	KALU MAN	Biodigester owner, Bagmati Province,			

			Chitwan, Nepal			
5	BDR THAPA PULAMI	PURNA	Biodigester owner, Bagmati Province, Chitwan, Nepal			
6	POKHREL	BINOD	Biodigester owner, Province no 1, Jhapa, Nepal			
7	ADHIKARI	INDRA PD	Biodigester owner, Province no 1, Jhapa, Nepal			
8	RAI	LOKEN DRA	Biodigester owner, Province no 1, Jhapa, Nepal			
9	BHUJEL	SITA DEVI	Biodigester owner, Gandaki Province , Kaski, Nepal			
10	ACHARYA	MUKTI	Biodigester owner, Gandaki Province , Kaski, Nepal			
11	PARIYAR	PREM KUMAR I	Biodigester owner, Gandaki Province , Kaski, Nepal			
12	GURGAIN	HARI PD.	Biodigester owner, Province no 1, Udaypur, Nepal			

List of (sample) questions asked from the bio digester owners with summary of their responses:

Questions	Responses
Q1. Is the biogas digester in use and is it under working condition? What is the source of fuel used for project device?	As per the responses provided by the bio digester owners, the answer was affirmative. The source of fuel used by the project device is biogas.
Q2. What is the baseline fuel used and technology?	As per the responses, they mainly used Firewood as

	a baseline fuel and traditional stoves as the baseline technology.
Q3. Who distributed the digester?	The owners mentioned that the bio digester were distributed to them by an agent from the AEPC.
Q4. Average technology usage per day	As per the responses, 1.5-2.5 hours/day by most of the users.
Q5. What are the other benefits you are getting from the digester?	No smoke as compared to baseline cooking practice, time saved due to quick cooking and no firewood collection/purchase required.

Also, the date of distribution of the digesters along with the household identification no., name, address etc. were asked during the remote audit.

3.3 Major Milestones in validation

Validation Contract	02/02/2021
On site Validation/ Microsoft teams application remote audit	15/03/2021 Household survey- 14/04/2021- 17/04/2021
Draft Validation Report	28/04/2021
Final Validation Report	25/06/2021

3.4 Use of the Validation Protocol

The validation protocol used for the assessment is designed in accordance with the latest version of Validation and Verification Standard. It serves the following purposes:

- Reference to available information relating to projects or technologies similar to the proposed project activity under validation;
- Review, based on the approved methodology and where applicable standardized baseline being applied, of the appropriateness of formulae and accuracy of calculations.
- Organises, details and clarifies the requirements the project is expected to meet; and
- Documents both how a particular requirement has been validated and the result of the validation (reporting).

The validation protocol consists of several tables. The different columns in these tables are described below.

Checklist Question	Ref ID	Means of Validation (MoV)	Validation Assessment	Draft and/or Final Conclusion
The various requirements are linked to checklist questions the project should meet.	Lists any references and sources used in the validation process. Full details are provided in the table at the bottom of the checklist.	Explains how conformance with the checklist question is investigated. Examples of means of validation are document review (DR) or interview (I). N/A means not applicable.	The section is used to elaborate and discuss the checklist question and/or the conformance to the question. It is further used to explain the conclusions reached.	This is either acceptable based on evidence provided (Y), or a Corrective Action Request (CAR) due to non-compliance with the checklist question (See below). Clarification Request (CL) is used when the validation team has identified a need for further clarification.

3.5 Findings

As an outcome of the RCP validation process, the validation team can raise different types of findings

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

Where a non-conformance arises, the validator shall raise a **Corrective Action Request (CAR)**. A CAR is issued, where:

- The CME have made mistakes that will influence the ability of the project activity to achieve real, measurable additional emission reductions;
- The CDM/GS requirements have not been met;
- There is a risk that emission reductions cannot be monitored or calculated.

A Forward Action Request (FAR) is raised during validation to highlight issues related to project implementation that require review during the first verification of the project activity. FARs shall not relate to the CDM/GS requirements for registration.

Corrective Action Requests and Clarification Requests are raised in the draft validation protocol and detailed in a separate finding document (Annex 2). In this document, the CME is given the opportunity to “resolve” the outstanding CARs and respond to CLs and FARs.

3.6 Internal Quality Control

Following the completion of the assessment process and a recommendation by the assessment team, the validation opinion prepared by Team Leader is independently reviewed by internal Technical Reviewer. TR reviews if all the KBS procedures have been followed and all conclusions are justified in accordance with applicable standards, procedures, guidance and CDM/GS4GG decisions. The TR either is qualified for the technical area within the CDM sectoral scope(s) applicable to project activity or is supported by qualified independent technical expert at this stage.

The Technical Reviewer will either accept or reject the recommendation made by the assessment team. The findings can be raised at this stage and CME must resolve them within agreed timeline.

The opinion recommended by Technical Reviewer will be confirmed by Manager Technical & Certification and finally authorized by the Managing Director on behalf of KBS as final validation opinion. The Technical Reviewer and Manager T&C maybe be same person.

4. Validation Findings

4.1 Project Description

Discussion:

The CPA is developed under the Small-Scale Programme of Activities (PoA) titled “Nepal Biogas Support Program-PoA/4/”. The CPA implementer is Alternative Energy Promotion Centre (AEPCC) a government body. The CPA involves implementation of biogas applications at individual household in Nepal. These applications displace firewood with biogas from animal waste and human excreta. The biogas is used as a fuel for cooking. Following the methodological guidance under Programme of Activities (PoA), only the replacement of non-renewable biomass (NRB) is counted as emission reduction under the Clean Development Mechanism (CDM). Target group under the BSP are households who currently use non-renewable biomass (firewood) for cooking.

This CPA includes 19,927 digesters/15/ which were implemented before the inclusion. The total no. of installation under this CPA has been restricted to less than 20,000. The CPA is the installation of biogas plants (digesters) of 2 m³ or 4 m³ or 6 m³ or 08 m³ or 10 m³ capacity each in the various regions and provinces of Nepal. The biogas units is fed by cattle dung generated from the households. The biogas stoves will replace the traditional firewood stoves used for cooking and heating purposes. Thereby, it avoids the related CO₂ emission from the use of non-renewable biomass. The CPA uses only one design i.e., GGC 2047 model. The operational lifetime of each digester is 20 years as confirmed from the technical specification manual/13/. Hence, the renewal of the crediting period is within the life span of each digester and therefore is acceptable to the validation team based on manufacturer’s specifications and industry standards.

The baseline scenario adopted for the project is the use of fossil fuels for thermal energy applications. CME has installed biogas units in 19,927 households in which 19,927 units were commissioned. The validation team confirms that no change in the technology or the implementation has been observed. Annual emissions reductions for the CPA are 64,868 tCO₂e per year in average. The physical and geographical boundary of PoA /04/ is entire host country i.e., Nepal as validated by interviewing the CME Representative.

CME has chosen a crediting period of 7 years which can be renewed twice. This is the renewal of the second crediting period which starts from 08/05/2021 to 07/05/2028.

Findings: CL 01, CAR 01 and CAR 03 were raised during the validation process, which has been successfully closed. Refer Annex 2 for more details.

Opinion:

The assessment team confirms that:

- (a) The project description as mentioned in CPA-DD is validated through interview with CME and supporting documents provided by CME.
- (b) Based on discussion above the assessment team confirms that project description provided in CPA-DD is complete and accurate, hence complies with CDM VVS PoA version 02.0/07/.

4.2 Contribution to Sustainable Development Goals

Discussion:

In CPA-DD, CME claimed the project contributes to the following sustainable development goals:

SDG 3 – Good Health and Well beings
SDG 7 – Affordable and Clean Energy

SDG 13 – Climate Action

Validation team assessed the CMEs claim on the contributions to the SDGs as below:

SDGs	Targets
3. Good Health and Well beings	By 2030, substantially reduce the number of deaths and illnesses from hazardous chemicals and air, water and soil pollution and contamination
7. Affordable and Clean Energy	- By 2030, ensure universal access to affordable, reliable and modern energy services - By 2030, increase substantially the share of renewable energy in the global energy mix - By 2030, expand infrastructure and upgrade technology for supplying modern and sustainable energy services for all in developing countries, in particular least developed countries, small island developing States, and land-locked developing countries, in accordance with their respective programmes of support
13. Climate Action	- Improve education, awareness-raising and human and institutional capacity on climate change mitigation, adaptation, impact reduction and early warning - Promote mechanisms for raising capacity for effective climate change-related planning and management in least developed countries and small island developing States, including focusing on women, youth and local and marginalized communities

Findings: No findings raised.

Opinion:

- The validation team confirms the proposed project will results in contributions to the SDGs 3, 7 & 13.
- Since the project contributes to more than two SDGs the validation team is in the opinion that the project is eligible under Gold standard as per GS4GG.

4.3 Baseline and monitoring methodology and Standardized baseline

4.3.1 General requirement

Discussion:

The proposed project activity falls under the small scale and it applies the CDM methodology – “AMS.I.E. Switch from Non-Renewable Biomass for Thermal Applications by the User, Version 9.0/05/.

Findings: No findings raised.

Opinion:

- The validation team is of opinion that applied approved CDM methodology is approved by Gold standard and CME has used the version of the applied baseline and monitoring methodology that is already available in the renewed CDM PoA-DD and hence acceptable.
- The CPA-DD has mentioned and correctly applied the guidance relevant as per applied methodology.



4.3.2 Project Eligibility to Gold Standard

Discussion:

The justification provided for the project eligibility is assessed as per the section 3.1.1 of GS4GG Principles & Requirements document, version 1.2/21/.

Requirements as per GS4GG Principles & Requirements	Assessment for this project
A Project type is automatically eligible for Gold Standard Certification if there are approved Gold Standard Activity Requirements and/or Gold Standard Impact Quantification Methodologies associated with it or as referenced in Gold Standard Product Requirements. These are published to the Gold Standard website and shall be followed where provided for a given Project type.	Since the project is distribution of biogas digesters is a renewable source of energy, the project is eligible under project type (a) 'Renewable Energy' as per the GS4GG 'Community Services Activity-Requirements', v1.2/21/. Also, the project uses the CDM approved methodology AMS.I.E. Switch from Non-Renewable Biomass for Thermal Applications by the User, Version 9.0/05/, which is acceptable to be used under Gold Standard. Hence, the project satisfies this eligibility requirement
For Project types that are not automatically eligible, a Project Developer may submit to Gold Standard for approval. This shall be done at minimum as part of the Preliminary Review, though it is recommended to engage with Gold Standard earlier to establish the criteria and requirements for approval.	Not relevant for this case as the project is automatically eligible as described above.
Project types applying for Gold Standard approval are referred to the Gold Standard Vision and Mission. The Project Developer shall demonstrate how the Project would contribute to these and how the Gold Standard for the Global Goals Requirements would be met in their application for approval.	The project avoids CO₂ emissions by avoiding using some non-renewable energy sources. Hence, the project helps in climate change mitigation by avoiding GHGs (CO₂) emissions. The CPA-DD also justify that how the project helps in achieving UN Sustainable Development Goals. Hence, the CPA is in line with the GS vision of "Climate security and sustainable development for all" and GS mission, "To catalyse more ambitious climate action to achieve the Global Goals through robust standards and verified impacts". Hence, the project satisfies the eligibility criteria.
In reviewing a new Project type for approval, Gold Standard may establish new Requirements to be met by the Project in order to achieve Gold Standard Design Certification and ongoing Gold Standard Certified Project status. Where required, Gold Standard shall engage expert peer reviewers to establish these Requirements, at the Project Developer's expense.	Not relevant for this case.
Gold Standard does not support Project types associated with geoengineering or energy generated from fossil fuel or nuclear, fossil fuel switch, or any project that supports, enhances or prolongs such energy generation. In certain cases, concerning energy efficiency involving fossil fuels (for example, LPG stoves), an exception is made. This is captured	The project does not fall in any of these technologies. Hence, the project satisfies the eligibility criteria.

in the relevant Activity Requirements, Gold Standard Approved Methodologies and/or Product Requirements.	
--	--

Findings: No findings raised.

Opinion:

The validation team therefore concluded project compliance with section 3.1.1 of GS4GG Principles & Requirements document, version 1.2/21/ requirements and hence the project is eligible under GS.

4.3.3 Applicability of selected baseline and monitoring methodology and selected standardized baseline to the project activity

Discussion:

The project uses the CDM methodology 'AMS.I.E. Switch from Non-Renewable Biomass for Thermal Applications by the User, Version 9.0/05/'. The applicability conditions are justified in the CPA-DD. The applicability conditions of the methodology are assessed for this CPA as below:

Criteria AMS-I.E.	Justification by VVB
Small-Scale project requirement: For biomass, biofuel and biogas project activities, the maximal limit of 15MW (e) is equivalent to 45 MW thermal output of the equipment or the plant (e.g. boilers). For thermal applications of biomass, biofuels or biogas (e.g. the cookstoves), the limit of 45 MW_{th} is the installed/rated capacity of the thermal application equipment or device/s (e.g. biogas stoves).	The biogas capacity of each stove is 400 litre/hour as verified by the validation team through interviews and technical specifications. With a methane content of 52%, this gives an annual natural gas capacity of not more than 1.86 kW_{th} per stove (validated during registration). This means that around 24,000 stoves would still have an aggregated capacity below the 45MW_{th} small scale threshold value, however the CPA has 19,927 installations only. Therefore, the validation team confirms that the criteria is met.
This category comprises activities to displace the use of non-renewable biomass by introducing renewable energy technologies. Examples of these technologies include but are not limited to biogas stoves, solar cookers, passive solar homes, renewable energy-based drinking water treatment technologies (e.g. sand filters followed by solar water disinfection; water boiling using renewable biomass).	The digesters are indeed "small thermal appliances that displace the use of non-renewable biomass by introducing new renewable energy end-user technologies". AMS-I.E., even lists biogas stoves as an example of eligible end user technologies. Therefore, the validation team confirms that the criteria is met.
Project participants are able to show that non-renewable biomass has been used since 31 December 1989, using survey methods or referring to published literature, official reports or statistics.	The BUS conducted in 2018 demonstrated that the time needed to gather firewood, the price of firewood and the distance travelled to gather firewood is increasing at least since December 1989 as verified from the supportive/12/.

	In that survey the respondents were asked to provide averages for the time needed to gather firewood, the distance travelled and the price. The average of the estimates from all respondents, showed a clear increase on all three indicators. Therefore, the validation team confirms that the criteria is met.
--	---

The CME has applied the version 09 of the CDM methodology 'AMS.I.E. Switch from Non-Renewable Biomass for Thermal Applications by the User' and is a small-scale Type I (i.e., Renewable Energy Project) and the maximum output of the project is below 45 MW_{th}. The project activity is also 'small scale' as per the GHG Emissions Reductions and sequestration product requirements (version 1.2) section 9 para 9.1.1 and para 9.1.2. Since the PoA is already renewed under the CDM with version 09 of the applied methodology, hence the CME has applied the version 09/05/. It is found that the CPA-DD meets all the requirements of the version 09/05/ of the applied methodology and hence found acceptable.

Findings: CL 03 was raised during the validation process, which has been successfully closed. Refer Annex 2 for more details.

Opinion:

The project fulfills all relevant criteria of the applied methodology 'AMS.I.E. Switch from Non-Renewable Biomass for Thermal Applications by the User, Version 9.0/05/. Hence, use of the selected methodology is appropriate for this project activity.

4.3.4 Deviation of applied methodology

No deviation of methodology proposed by PP.

4.3.5 Project boundary

Discussion:

The project boundary of the CPA is in line with the PoA and methodology applied/05/.

The validation team was able to confirm that all the identified emission sources which are impacted by the project activity are addressed by the approved methodology /05/ and can be seen in the table below.

	Source	GHGs	Included?	Justification/Explanation
Baseline scenario	Emissions from NRB use for cooking	CO ₂	Yes	Main emission source.
		CH ₄	No	Excluded for simplification. This is conservative.
		N ₂ O	No	Excluded for simplification. This is conservative.
Project scenario	Emission from digester and biogas cooking stove	CO ₂	No	This is not required by AMS.I.E however, leakage will be considered as project emission
		CH ₄	No	This is not required by AMS.I.E
		N ₂ O	No	This is not required by AMS.I.E

Findings: No findings raised.

Opinion:

By checking the information in CPA-DD and by the Microsoft teams interview, validation team could confirm that all the emission sources and gases have been included in the project boundary and the description in the CPA-DD is accurate and complete, and also that the selected sources and gases are justified for the CPA-DD.

4.3.6 Baseline identification

Discussion:

The validity of the baseline was assessed in the PoA level in accordance with the applicable validation requirements in the VVS PoA and “Assessment of validity of the original/current baseline and update of the baseline at the renewal of a crediting period” Version 03.0.1. Since, there is no mandatory legal requirement for installation of biogas system in households of Nepal. The policies relevant to the program are ‘the Rural Energy Policy’, ‘the Renewable (Rural) Energy Subsidy Policy’ and ‘the Renewable (Rural) Energy Subsidy Delivery Mechanism’. The Renewable (Rural) Energy Subsidy Policy 2016 has made provisions of financial subsidy support for the installation of the household biogas plants. The above policies only provide the incentives for the installation of household biogas plants and do not provide any obligations or enforced targets, nor do they ban the use of fuel wood for cooking. Therefore, it can be concluded that the original baseline is still valid for the current CPA.

Also, as per para 392 of the VVS PoA, the validation team confirms that the following parameters have been updated from the registered CDM CPA-DD:

Parameter	Value in the registered CDM CPA-DD (Version 03)	Value in the revised GS CPA-DD	Assessment
$f_{NRB,y}$ Fraction of woody biomass saved by the project activity during year y that can be established as non-renewable biomass	86%	86.1 %	The validation team confirms that the value has been calculated as per the latest tool for Calculation of the fraction of non-renewable biomass” and is fixed in the latest PoA-DD.
$EF_{projected_fossilfuel}$ Emission factor for the projected fossil fuel consumption in the baseline.	81.6 tCO ₂ /TJ	63.7 tCO ₂ /TJ	The validation team confirms that the updated value is consistent with the applied methodology i.e AMS.I.E. version 09 and is fixed in the latest PoA-DD.
B_y Quantity of woody biomass	3.33 tonne/household/ year	4.50 tonne/household/ year	The value has been calculated based on latest biogas user surveys (at the time of RCP of PoA) conducted by the CME during 2018 and it was found to be acceptable by the validation



that is substituted or displaced			team.
----------------------------------	--	--	-------

Finding: No findings raised.

Opinion:

The baseline of the project is identified as per the methodology “AMS.I.E. Switch from Non-Renewable Biomass for Thermal Applications by the User, Version 9.0”/05/ and found reasonable.

Additionality & Ongoing Financial Need:

The validation team confirms that the project complies with paragraph 2 of the Guidelines on the demonstration of additionality of small-scale project activities” (version 09) EB 68 Annex 27 which states that “Documentation of barriers, as per paragraph 1 above is not required for the positive list of technologies and project activity types that are defined as automatically additional for project sizes up to and including the small-scale CDM thresholds (e.g., installed capacity up to 15 MW)”. Also, as per para 4.1.9 of “Community Service Activity Requirement”, the projects under positive list are considered additional. Since the technologies included are biogas digesters which comply with the methodology AMS I.E, therefore the technologies comes under positive list as indicated by the CDM Tool 32 (para 21 (a)). So, the VPA is also automatically additional. Further, each unit of biogas digester has the capacity of not more than 1.86 kWth which is less than 5% of the small-scale CDM threshold, or 750 kW installed capacity. The VPA is thus additional and there is no need for further assessment and demonstration of additionality.

Further, since Information on the “Ongoing Financial Need” has to be incorporated to those projects only which required to demonstrate the financial additionally as per section B.5.2 of the template filling guidelines for VPA-DD, hence it will not be applicable. However, as confirmed from the remote audit interviews, the ongoing financial need derived from the GS certification is necessary to enhance the project's operation in 2nd crediting period for the repair/maintenance and management of the PoA. The financial benefit from GS certification helps to maintain the PoA contributing to the sustainable development of the community and the country and further emission reduction.

4.3.7 Estimation of emission reduction or net anthropogenic removals

Discussion:

$$ER_y = B_y \cdot f_{NRB,y} \cdot NCV_{biomass} \cdot EF_{projected, fossil fuel}$$

In which:

ER_y	Emissions Reductions during the year y (tCO ₂ e)
B_y	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, Use 86.1% ¹

¹ The value is calculated using “TOOL 30: Calculation of the fraction of non-renewable biomass” as given in section I.6.1 of PoA-DD and the value is fixed ex-ante. Use 86.1%

$NCV_{biomass}$ Net calorific value of the non-renewable woody biomass that is substituted (IPCC default for wood fuel: 0.0156 TJ/tonne). The value is according to the methodology AMS I.E.

$EF_{projected-fossilfuel}$ Emission factor for substitution of non-renewable woody biomass by similar consumers. Use a value of 63.7 tCO₂/TJ²

Leakage

The default factor of 0.95 is used to account for any potential leakage, as prescribed by the methodology. Thus, the leakage emission under a CPA is calculated as the following:

$$LE_y = 0.05 \times B_y \cdot f_{NRB,y} \cdot NCV_{biomass} \cdot EF_{projected_fossilfuel}$$

The emission reduction calculations provided in the GS CPA has been found to be correct.

CME has submitted the emission reduction calculation in a excel sheet/03/. The excel sheet is clear, viewable, non-protected and the calculated values in the sheet are reproducible. Hence the ex-ante emission reduction calculated for this project is correct.

Below is the list of the ex-ante parameters:

Parameter	Value	Source and validation
$BC_{BL,HH,y}$ Average annual consumption of woody biomass per household before the start of the project activity	5.04 tonne/household/year	The value is fixed and was found to be consistent with the registered PoA-DD for 2 nd crediting period.
$f_{NRB,y}$ Fraction of woody biomass saved by the project activity during	86.1 %	The value is fixed and was found to be consistent with the registered PoA-DD for 2 nd crediting period.

² This value represents the emission factor of the substitution fuels likely to be used by similar users, on a weighted average basis. The value is calculated, based on the global average ratio of cooking fuels (the normalized ratio of kerosene and liquefied petroleum gas (LPG) excluding coal), i.e. 9 per cent for kerosene (71.5 t CO₂/TJ) and 91 per cent for LPG (63.0 t CO₂/TJ).

year y that can be established as non-renewable biomass		
EF _{projected_fossilfuel} Emission factor for the projected fossil fuel consumption in the baseline.	63.7 tCO ₂ /TJ	The value is fixed and was found to be consistent with the applied methodology and the registered PoA-DD for 2 nd crediting period.
N _{HH} Number of households in each CPA in year y	19,927 digesters	The value has been checked from the CPA database and was found to be acceptable by the validation team.

Findings: CL 02 and CAR 02 was raised during the validation process, which has been successfully closed. Refer Annex 2 for more details.

Opinion:

The assessment team confirms that

- All assumptions and data used by the CME are listed in the CPA-DD, including their references and sources;
- All documentation used by CME as the basis for assumptions and source of data is correctly quoted and interpreted in the CPA-DD;
- All values used in the CPA-DD are considered reasonable in the context of the proposed PoA/04/;
- The baseline methodology has been applied correctly to calculate project emissions, baseline emissions, leakage and emission reductions;
- All estimates of the baseline emissions can be replicated using the data and parameter values provided in the CPA-DD.

4.4 Application of Monitoring Methodology

The monitoring plan is in compliance with the applied GS monitoring methodology: AMS.I.E. Switch from Non-Renewable Biomass for Thermal Applications by the User, Version 9.0/05/.

All monitoring parameters in the CPA-DD are realistic and feasible to measure and monitor. The monitoring of few parameters will be based on a sampling method.

Parameter/ Relevant SDG Indicator	Unit/Value	Description and source/Justification
By Quantity of woody biomass that is substituted or displaced SDG Indicator: 3.9.1 Mortality rate attributed to household and ambient air pollution	It ranges from zero when biogas is not in operation to 5.04 tonnes/household/year when BCPJ,HH,y is zero and biogas is operational.	This will be calculated based on the operational status of the biogas digesters for particular monitoring period and the woody biomass consumed by pre-project devices during project activity. The percentage of biogas units found to be operational during the sample survey shall be used to calculate the weighted average operational status

		of the biogas which then will be used to calculate B_y as follows: $B_y = N_{HH} * (BC_{BL,HH,y} - BC_{PJ,HH,y})$ where N_{HH} will be the household with operational biogas digester for the particular monitoring period. $N_{HH} = N * P_y$, where N is the number of bio digesters installed in the project and P_y is Proportion of Bio digesters operational estimated based on the sample survey. Though the methodology requires sample survey biennially, CME conducts the user survey annually to ensure the number of biogas digesters operational for that particular year for each CPA.
$BC_{PJ,HH,y}$ 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. SDG Indicator: 3.9.1 Mortality rate attributed to household and ambient air pollution	0.54 tonnes/household/year for the ex-ante calculation as per the Biogas User Survey for similar project activities. For this crediting period, this parameter will be determined using regular user survey.	The value has been verified from the biogas user survey report/12/ and found consistent by the validation team. Biogas User Survey will be conducted on a sample of households. The sample size is determined to achieve 90% confidence interval and a 10% margin of error. During the survey, the estimates of the biogas users on the average annual consumption of woody biomass during the monitoring period will be captured.
$NCV_{biomass}$ Net calorific value of the non-renewable biomass briquettes or charcoal used in project devices SDG Indicator: 3.9.1 Mortality rate attributed to household and ambient air pollution	0.0156 TJ/tonne	De-fault value has been applied from the methodology AMS I.E version 09/05/ and found consistent.
Users' perception on reduction in indoor air pollution SDG Indicator: 3.9.1 Mortality rate attributed to household and ambient air pollution	Qualitative (to be monitored)	The parameter will be monitored biennially and accessed through user's interviews during the Biogas User Survey which is in compliance with the registered PoA-DD/04/. The Annual Biogas User Survey will be conducted following the Guidelines for Sampling and Surveys for CDM Project activities and Programme of

		Activities Ver. 4.0 (EB 86, Annex 4)/11/. As part of the survey, statistically representative sample of biogas users will be surveyed and in order to achieve 90% confidence interval and a 10% margin of error requirement for the sampled parameters. Stratified random sampling will be applied in conducting survey. The sample to be surveyed will be drawn randomly from the population of biogas digester distributed in each stratum (i.e., remote hill, hill and terrai) spread within the project boundary of the PoA as verified by the validation team through interviews.
Reduction in health problem Users' perception on reduction in health problem SDG Indicator: 3.9.1 Mortality rate attributed to household and ambient air pollution	Qualitative (to be monitored)	The parameter will be monitored biennially and accessed through user's interviews during the Biogas User Survey/12/ which is in compliance with the registered PoA-DD/04/. The Annual Biogas User Survey will be conducted following the Guidelines for Sampling and Surveys for CDM Project activities and Programme of Activities Ver. 4.0 (EB 86, Annex 4)/11/. As part of the survey, statistically representative sample of biogas users will be surveyed and in order to achieve 90% confidence interval and a 10% margin of error requirement for the sampled parameters. Stratified random sampling will be applied in conducting survey. The sample to be surveyed will be drawn randomly from the population of biogas digester distributed in each stratum (i.e., remote hill, hill and terrai) spread within the project boundary of the PoA as verified by the validation team through interviews.
User's perception in Time saving for the cooking (reduce exposure to indoor air pollution) SDG Indicator: 3.9.1 Mortality rate attributed to household and ambient air pollution	Qualitative (to be monitored)	The parameter will be monitored biennially and accessed through user's interviews during the Biogas User Survey which is in compliance with the registered PoA-DD/04/. The Annual Biogas User Survey will be conducted following the Guidelines for Sampling and Surveys for CDM Project activities and Programme of Activities Ver. 4.0 (EB 86, Annex 4)/11/. As part of the survey, statistically representative sample of biogas users will be surveyed and in order to achieve 90% confidence

		interval and a 10% margin of error requirement for the sampled parameters. Stratified random sampling will be applied in conducting survey. The sample to be surveyed will be drawn randomly from the population of biogas digester distributed in each stratum (i.e., remote hill, hill and terrai) spread within the project boundary of the PoA as verified by the validation team through interviews.
Time saving (Fuel wood collection) Users' perception on time saving due to project for firewood collection SDG Indicator: 7.1.2 Proportion of population with primary reliance on clean fuels and technology	Qualitative (to be monitored)	The parameter will be monitored biennially and accessed through user's interviews during the Biogas User Survey which is in compliance with the registered PoA-DD/04/. The Annual Biogas User Survey will be conducted following the Guidelines for Sampling and Surveys for CDM Project activities and Programme of Activities Ver. 4.0 (EB 86, Annex 4)/11/. As part of the survey, statistically representative sample of biogas users will be surveyed and in order to achieve 90% confidence interval and a 10% margin of error requirement for the sampled parameters. Stratified random sampling will be applied in conducting survey. The sample to be surveyed will be drawn randomly from the population of biogas digester distributed in each stratum (i.e., remote hill, hill and terrai) spread within the project boundary of the PoA as verified by the validation team through interviews.
Users perception in reduction of chemical fertilizers SDG Indicator: 3.9.3 Mortality rate attributed to unintentional poisoning	Qualitative (to be monitored)	The parameter will be monitored biennially and accessed through user's interviews during the Biogas User Survey which is in compliance with the registered PoA-DD/04/. The Annual Biogas User Survey will be conducted following the Guidelines for Sampling and Surveys for CDM Project activities and Programme of Activities Ver. 4.0 (EB 86, Annex 4)/11/. As part of the survey, statistically representative sample of biogas users will be surveyed and in order to achieve 90% confidence interval and a 10% margin of error requirement for the sampled parameters. Stratified random sampling will be applied in conducting survey. The sample to be

		surveyed will be drawn randomly from the population of biogas digester distributed in each stratum (i.e., remote hill, hill and terrai) spread within the project boundary of the PoA as verified by the validation team through interviews.
Improved access to sanitation services SDG Indicator: 3.9.2 Mortality rate attributed to unsafe water, unsafe sanitation and lack of hygiene (exposure to unsafe Water, Sanitation and Hygiene for All (WASH) services)	Number (to be monitored)	The parameter will be monitored biennially and accessed through user's interviews during the Biogas User Survey which is in compliance with the registered PoA-DD/04/. The Annual Biogas User Survey will be conducted following the Guidelines for Sampling and Surveys for CDM Project activities and Programme of Activities Ver. 4.0 (EB 86, Annex 4)/11/. As part of the survey, statistically representative sample of biogas users will be surveyed and in order to achieve 90% confidence interval and a 10% margin of error requirement for the sampled parameters. Stratified random sampling will be applied in conducting survey. The sample to be surveyed will be drawn randomly from the population of biogas digester distributed in each stratum (i.e., remote hill, hill and terrai) spread within the project boundary of the PoA as verified by the validation team through interviews.
Trainings to Masons Masons involved in constructing the biogas plants shall receive training on the proper installation of biogas digesters. SDG Indicator: 7.1.2 Proportion of population with primary reliance on clean fuels and technology	Number of people trained to promote Biogas plants (to be monitored)	The parameter will be monitored biennially and accessed through training reports.
Impact on Crop Productivity Safeguarding Principle 4.3.8	Qualitative (to be monitored)	The parameter will be monitored biennially and accessed through user's interviews during the Biogas User Survey which is in compliance with the registered PoA-DD/04/. The Annual Biogas User Survey will be conducted following the Guidelines for Sampling and Surveys for CDM Project activities and Programme of Activities Ver. 4.0 (EB 86, Annex 4)/11/. As part of the survey, statistically representative sample of

		biogas users will be surveyed and in order to achieve 90% confidence interval and a 10% margin of error requirement for the sampled parameters. Stratified random sampling will be applied in conducting survey. The sample to be surveyed will be drawn randomly from the population of biogas digester distributed in each stratum (i.e., remote hill, hill and terrai) spread within the project boundary of the PoA as verified by the validation team through interviews.
--	--	--

The validation team considers that the description of the monitoring plan contains all necessary parameters, that they are described and that the means of monitoring described in the plan complies with the requirements of the methodology including applicable tool(s). The same was also confirmed through Microsoft teams interviews and remote auditing.

During the interviews, it was found that the monitoring plan of the CPA-DD is based on the overarching CME management system and defines roles/responsibilities and internal arrangements in detail and in the context of the PoA. The details of monitoring and management system with roles and responsibilities are mentioned in the CPA-DD /02/ and also confirmed during the interview.

Sampling Plan:

As stated in section 3.2 above, a remote auditing was conducted for CPA 002. Sampling approach was applied during remote auditing with respect to para 29 (e) ii) of VVS for PoA version 02.0 /07/ to check the physical implementation of the CPA in line with the registered PoA /04/ and assess the baseline as stated in CPA-DD /02/. CME has provided the CPA database /15/ and random samples from the list were checked. In order to meet the requirement of paragraph 24 and 25 of "Sampling and surveys for CDM project activities and programmes of activities Version 08.0 /10/, simple random sampling was applied. 11 bio digester users samples were checked by remote auditing and compared the observations with the information mentioned in the CPA database (19,927 households) /15/, Biogas user survey /12/, CPA-DD/02/ and other documents. Sampling approach using the Standard (Sampling and surveys for CDM project activities and programmes of activities Version 08.0) has been applied as per Table on page 13 "Sample size and acceptance number based on AQL, UQL, and producer and consumer risks.

The following approach for the same from the table in standard is chosen:

- AQL 0.5%, UQL 20%,
- Producer risk: 10%
- Consumer risk: 10%

with "0" acceptance number to arrive at the sample size from each appliance i.e., bio digester.

The details including baseline practice, date of distribution of project digesters, type of product, unique id of digesters, name of user and address etc. were verified and found to be consistent with the ones reported in the database and other supportive documents. No inconsistency was observed for any of the samples. Summary is below:

Parameters/Aspects	Total	CME's	Acceptance	Acceptance	Sampling
--------------------	-------	-------	------------	------------	----------

	Population	sample size	sample size	Number	method used
baseline practice, date of distribution of project digesters, type of product, Unique id of digesters, name of user and address	19,927	NA at validation stage	11	0	Acceptance Sampling based on random selection of households.

Quality Assurance/Quality Control

The CME will ensure that the monitoring personnel have reviewed, understood and have agreed to follow the monitoring plan procedures. A quality control and assurance strategy will be documented. The same was confirmed through the interviews with CME & CPA Implementer.

The VVB is of the opinion that sufficient provisions are established to monitor the project activity and to obtain unbiased, reliable measurement of the data during the collection/measurement. The personnel to be engaged will be adequately trained and qualified and the credentials and/or training materials for the sampling personnel can be checked by the verifying VVB at verification stage.

The sampling approach presented in CPA-DD /02/ is in accordance with the Guidelines for Sampling and Surveys for CDM Project Activities and Programme of Activities /11/ and appropriate for the type of the project. Validation team has found the sampling approach feasible and consistent with the renewed PoA-DD /04/.

The CPA-DD clearly describes the detailed monitoring procedures, monitoring structure, monitoring items and training which in conformity with applied methodology. The validation team confirms that the specific uncertainty levels, methods, and associated accuracy level of measurement instruments and calibration procedures used for various parameters and variables are identified in the CPA-DD, along with detailed quality assurance and quality control procedures.

Based on review of the CPA-DD and interview with relevant stakeholders, the validation team confirms that the monitoring plan presented in CPA-DD is feasible to implement and will result in credible emission reduction calculations.

Findings: No findings raised.

Opinion:

The validation team confirms that:

- All the values used from official sources and the authenticity of sources has been verified and the validation team confirms that all relevant parameters to calculate the GHG emissions reductions of the project have been sufficiently considered and the value of the ex-ante fixed parameter used for emission reduction calculation determined conservatively. The validation team considers that the monitoring plan has complied with the requirements in the approved methodology thereby satisfying requirement of VVS version 2.0/07/.
- The monitoring plan based on the applied methodology is included in the CPA-DD and is correctly applied to the GS CPA-DD. The monitoring plan has been found to be in compliance with the requirements of the applied methodology. The monitoring plan will give opportunity for real measurements of achieved emission reductions.

- (c) The validation team considers that monitoring arrangements described in the monitoring plan and feasible within the project design and the CME will be capable to implement the monitoring plan.

5. Safeguarding Principles Assessment

CME has done the safeguarding principles assessment analysis and presented assessment in the Gold standard CPA-DD. The assessment has been performed in accordance to requirements prescribed in the GS4GG Principles & Requirements, Version 1.2 & Safeguarding Principles & Requirements, Version 1.2/21/.

Validation team has carried out Microsoft teams interviews and remote auditing to cross check the safeguarding principle assessment conducted by the CME. GS VVB has also reviewed the initial GS local stakeholder consultation report and GS4GG CPA-DD and found that the CME has assessed all the required critical safeguarding principle of United Nations in project activity. It has been found that the CPA fulfills all the principles like Human Rights, Labor standards, environment protection, and anti-corruption.

The detailed assessment of safeguarding principle is provided below, however, it shall be noted that the CPA has been already implemented and registered:

Safeguarding principles	Assessment
Human Rights	As mentioned by CME through interviews, the project doesn't involve any activity that affects human right but promotes the human rights to have access to clean energy and environment. The project shall not discriminate any people to have biogas plants rather it enhances the participation and inclusion. Hence validation team concludes the project will not harm the human rights.
Gender equality and Women's Rights	CME confirms project enhances the women's access and entitlement of benefits. Since the women will be direct user of the Biogas stoves, it will benefit women by reducing their exposure to the indoor air pollution thereby improving their health. In addition, the replacement of firewood after the installation of Biogas will reduce workload of women for the collection of firewood. Reduced workload for firewood collection results in time saving that the women can use for other productive activities. The project shall make every effort to include landless people in its design. Benefits from the project is expected to culminate in form of creation of entrepreneurial opportunities. While the focus is on capacitating women to take advantage of the entrepreneurial opportunity, the project shall not deprive men from the families of minority groups or the landless people to take advantage of the capacity building activities CME confirmed that both the women and men will be equally considered in the participation of the project. Without any discrimination, both will be equally trained on the maintenance and to the use of bio digesters. The CME has previously implemented similar projects and from checking the implementation and operation of those projects, it can be confirmed that the CME has not discriminated man and women in any activity. The stakeholder consultation documents also verified and found that there is no discrimination in the consultation. The CME also confirmed that CME will take into account gender roles and the abilities of women or men to benefit from the Project's activities. The GS CPA provides opportunities to women to participate in the project activities and also the CME will provide training to the women in the new technology. Hence the project will make the women more competent and hence it will help in reducing the discrimination against women.

	Also, the GS CPA does not limit women's ability to use, develop and protect natural resources. The project will enhance social participation and decision-making role of women. Moreover, the women are expected to develop entrepreneurial skills which will enable them economically to deal with the household problems. The potential of the project to enable women economically will help reduce discrimination against women rather than deepening it. The justification provided by CME is found to be appropriate for this CPA context. Hence validation team concludes it does not lead to any gender-based discrimination in this CPA and also it will not harm any women's right.
Community Health, Safety and Working Conditions	As checked, the project leads to safe working condition and improvement in health. Emission reduction and reduction on indoor air pollution is one of the key benefits of the project for community that will improve the health of those communities. Hence, validation team conclude that the project will avoid community exposure to increased health risks and will not adversely affect the health of the workers and the community.
Sites of Cultural and Historical Heritage	As checked, the project will not involve sites Cultural and Historical Heritage. Hence, validation team concludes that there is no risk on cultural heritage or land tenure rights by the CPA.
Forced Eviction and Displacement	Being a household technology, the project shall not involve any activity for involuntary relocation of people.
Land Tenure and Other Rights	As checked, the project will not involve anything related to removal of sites, objects or structures of cultural significance. Therefore, the safeguarding principle under discussion will not be triggered by the project. Hence, validation team concludes that there is no risk on land tenure rights by the CPA.
Indigenous people	As checked, the project will provide additional support to indigenous people.
Corruption	The project is guided by the government's subsidy policy and duly followed the set quality standard. Quality assurance and quality control is an integral part of the project implementation ensuring the quality throughout the project cycle. There is no corruption provision in the project activity and hence the project will not complicit in corruption.
Labour Rights	The project is guided by the government's subsidy policy and duly followed the set quality standard. Quality assurance and quality control is an integral part of the project implementation ensuring the quality throughout the project cycle. There is no child labour in the project activity and hence the project will not complicit in child labour.
Negative Economic Consequences	The project units are simple and have less moving parts. So, it requires less repair and maintenance. Hence the operational cost is less in comparison to the energy access and the additional benefits that it offers. So, the project implemented is sustainable financially and has positive economic impacts by offering the time saving, ease in cleaning the utensils, reducing health risk and indoor air pollution etc. This has no negative economic impacts. Hence, validation team confirms there are no negative economic impacts due to the implementation and operation of the project activity.
Emissions	The project will replace the use of non-renewable biomass as verified by the

	assessment team. The baseline of the project is the use of firewood for cooking. So, this project will reduce the GHG over the baseline scenario.
Energy Supply	The project will not use any fuel resources that provides for other local users. It uses the animal dung. Therefore, the safeguarding principle under discussion will not be triggered by the project.
Impact on natural water patterns and flow	The project requires very less water to make the slurry that can be fetched at household level itself. Therefore, the safeguarding principle under discussion will not be triggered by the project.
Erosion and/or water body stability	The project units are installed at household level which will not directly or indirectly cause additional erosion or disrupt the water body as claimed by CME. Therefore, the safeguarding principle under discussion will not be triggered by the project.
Landscape Modification and Soil	The project is distribution of bio digesters. It therefore does not involve production of crops neither will it lead to soil degradation. Hence the project does not alter soil quality.
Vulnerability to Natural Disaster	The project units are household-based units and are less susceptible to the natural disasters. Hence validation team conclude that the project activity does not lead to increased vulnerability to wind, earthquakes, subsidence, landslides, erosion, flooding, drought or other extreme climatic conditions.
Genetic Resources	The project is distribution of bio digesters and therefore, is not linked to any activity related to genetic resources.
Release of pollutants	The project units generally yields the Biogas and Bio-slurry. The biogas is used for the cooking purposes whereas the bio slurry is used as nutrients (manure) in the agriculture field. Hence validation team conclude that the project will not result in the release of pollutants to the environment; instead, it will reduce the release of pollutants.
Hazardous and Non-hazardous Waste	Project does not involve in hazardous material production, trade or release.
Pesticides & Fertilizers	The project is a water filter project that does not use pesticides nor fertilizers.
Harvesting of Forests	The project does not involve in harvesting of project. Hence, validation team confirms the project will not have any adverse impact over forests.
Food	Though the project activity and its boundary does not involve the food production, crop regime alteration or export or economic incentives, the biproduct of the project increases the productivity.
Animal Husbandry	The project does not involve any activity that requires animal husbandry as confirmed by the validation team.
High Conservation Value Areas and Critical Habitats	As checked, the project technologies are household technologies and will not have any impacts on identified habitat and have no adverse impact on biodiversity.
Endangered Species	As checked, the project technologies are household technologies and do not lead to the adverse impact on endangered, vulnerable or critically endangered species.

The VVB has checked the justification along-with the references as provided in Appendix 1 of the CPA-DD and found correct. The validation approach did not reveal any situation that could lead to the violation of safeguarding principles and VVB has confirmed that the project activity fulfils all the safeguarding principles given by United Nations.

Findings: No findings raised.

Opinion:

All supporting information & reference sources stated in the GS4GG CPA-DD in order to support the assessment have been verified by the validation team & confirmed the assessment has been carried out based on accurate information. All of the Safeguarding Principles were evaluated and assessed as low risk. Hence no mitigation measures proposed.

6. Environmental Impacts

Discussion:

The environmental analysis is performed at the PoA level; the choice has been justified by the CME in the renewed PoA DD/4/. The assessment team hereby confirms that the CME has undertaken an analysis of environmental impacts at PoA level and information is provided therein which is in accordance with procedures as required by the host Party.

Findings: No findings raised.

Opinion:

The assessment team confirms that the PoA/CPA does not require environment impact assessment in accordance with the procedures of the host Party. Thus, the requirement stated in the VVS V02 for CDM PoAs has been complied with.

7. Local Stakeholder Comments

Discussion:

The local stakeholder consultation process is performed at the PoA level, the choice has been justified by the CME in section D.4 of the PoA DD /04/.

Also, the stakeholder feedback round was conducted with sending e-mail to the stakeholders on 19th March 2021. The notice for the feedback were also published in AEPC's website and atmosfair gGmbH website on the same date.

AEPC website: <https://www.aepc.gov.np/uploads/docs/invitation-to-comment-on-cpas-under-nepal-biogass-support-programme-poa-for-crediting-period-renewal-1616145309.pdf>

atmosfair website: <https://www.atmosfair.de/wp-content/uploads/invitation-to-comment-on-cpas-under-nepal-biogass-support-program-poa-for.pdf>

During the 2 months comments period, no comments/feedback were received as confirmed from the website and during remote audit.

Findings: No findings raised.

Opinion:

The validation team was able to conclude that the PoA has not received any adverse comment during stakeholders' consultation process. The validation team confirms that the process for conducting the local stakeholders meeting is adequate and credible.

8. Grievance Mechanism

Discussion:

During the stakeholder feedback round the local villagers and other stakeholders were informed about the continuous input mechanism, the expression method and contact details were briefed. This was confirmed by the validation team during interview with the stakeholders done by the local expert. The grievance column has been published in the official website of AEPC (www.aepc.gov.np) in order to check how the grievances are taken into account and how they are received by the CME. It has been confirmed from the remote audit (Microsoft teams video conferencing) that no comments were received regarding the CPA from the local stakeholders till date.

Findings: No findings raised.

Opinion:

The grievance mechanism proposed in the GS CPA-DD by CME is verified to be adequate and in line with the requirement of GS4GG.

9. References

No.	Author	Title	References to the document	Provider
1.	AEPC	GS4GG VPA DD	Version 01 dated 14/03/2021	AEPC
2.	AEPC	Final GS4GG VPA DD	Version 04 dated 24/06/2021 (final version)	AEPC

3.	AEPC	- ER spreadsheet - ER spreadsheet	- corresponding to VPA DD Version 01 - corresponding to VPA DD Version 04	AEPC
4.	AEPC	GS4GG PoA DD	version 3, dated 31/01/2020	AEPC
5.	UNFCCC	AMS.I.E. Switch from Non-Renewable Biomass for Thermal Applications by the User	Version 09	UNFCCC website
6.	AEPC	Letter of Approval from Nepal (host Party)	dated 31/12/2009 ref. no.838	UNFCCC website
7.	UNFCCC	CDM VVS for PoAs	Version 2.0	UNFCCC website
8.	UNFCCC	CDM PS for PoAs	Version 2.0	UNFCCC website
9.	UNFCCC	CDM PCP for PoAs	Version 2.0	UNFCCC website
10.	UNFCCC	Standard for sampling and surveys for CDM project activities and PoAs,	Version 08	UNFCCC website
11.	UNFCCC	Guidelines on Sampling and surveys for CDM project activities and programmes of activities,	Version 04	UNFCCC website
12.	AEPC	Biogas User Survey Report	dated May 2018	AEPC
13.	AEPC	Technical Specifications detailing digester models and equipment applied	-	AEPC
14.	AEPC	Plant commissioning reports from Biogas Companies (BC).	-	AEPC
15.	AEPC	CPA database, Internal database/records	-	AEPC
16.	UNFCCC	Assessment of validity of the original/current baseline and update of the baseline at the renewal of a crediting period" Version 03.0.1	-	UNFCCC website
17.	AEPC	Local stakeholder consultation report dated 18/03/2021, Version 06		AEPC

18.	AEPC	Notice published for regular grievance and input in website: https://www.aepc.gov.np/uploads/docs/l-b-b-aa-b-b-1544451317.pdf	-	AEPC
19.	atmosfair	Atmosfair website: https://www.atmosfair.de/en/climate-protection-projects/biogas-biomass/nepal/	-	Publicly available
20.	AEPC	AEPC website (www.aepc.gov.np)	-	Publicly available
21.	GS4GG	GS4GG-Stakeholder Consultation Requirements Guidelines, v1.2' GS4GG Principle & Requirements, version 1.2 GS4GG 'Community Services Activity-Requirements', v1.2 COVID 19 Interim measures	-	Publicly available

Annex 1: Detailed Findings

Table 1. FARs from previous GS review/ preliminary review



FAR ID	XX	Section No.	-	Date:
Description of FAR				
CME response				Date:
Documentation provided by CME				
VVB assessment				Date:

Table 2. CL from this validation

CL ID	01	Section no.	4.1	Date: 17/04/2021
Description of CL				
Following documents are required for further validation process: 1. Commissioning Report from Biogas Companies (BC) 2. Installation confirmation from Biogas Companies (BC) 3. Local stakeholder consultation report 4. GS PoA-DD Version 03 dated 31/01/2020				
CME response				Date: 28/04/2021
1. Commissioning Report from Biogas Companies are attached with the response. See SD#1 for the reference. 2. Installation confirmation and commissioning reports are same. So, please see SD#1 for the reference. 3. LSC was done at PoA level. The corresponding LSC report for the PoA is attached for the reference. See SD#2 for LSC report. 4. The applicable GS PoA-DD for this crediting period is attached. See SD#3 for the reference.				
Documentation provided by CME				
SD#1_Plant Completion reports-CPA-2				
SD#2_LSC Report_GS 3110				
SD#3_GS4GG_PoA-DD_GS 3110_2nd Crediting period_V3_Clean				

VVB assessment	Date: 28/04/2021
1. The commissioning reports from biogas companies have been provided and was found to be acceptable. Hence, the finding is closed. 2. The commissioning/installation reports from biogas companies have been provided and was found to be acceptable. Hence, the finding is closed. 3. The LSC report dated 18/03/2021 has been provided and was found to be acceptable. Hence, the finding is closed. 4. The approved GS-PoA-DD has been provided. Hence, the finding is closed.	

CL ID	02	Section no.	4.3.7	Date: 17/04/2021
Description of CL				
In the ER sheet, it is not mentioned how the value of Percentage of digesters implemented that is operational in year y (Performance Factor) has been calculated. Kindly clarify				
CME response				Date: 28/04/2021
The operational percentage of digester is taken from the registered CDM PoA-DD for ex-ante calculation of CPA. Please see footnote 29 of the registered CDM PoA-DD (version 17 dated 05/09/2019) for clarification. Since this is taken for ex-ante calculation and will be monitored ex-post, this has no impact in actual ER calculation during monitoring. So, the ER sheet is also revised accordingly and provided with this response.				
Documentation provided by CME				
<i>Revised ER sheet</i>				
VVB assessment				Date: 28/04/2021
The more detailed reference for Percentage of digesters implemented that is operational in year y (Performance Factor) has been now included in the ER sheet and was found to be acceptable. Hence, the finding is closed.				

CL ID	03	Section no.	4.3.3	Date: 17/04/2021
Description of CL				
In section B.2 and B.4 of the VPA-DD, it has been mentioned that the Biogas User Survey has been conducted in 2017/2018 however, as per the registered documents, the frequency of survey is biennial and since this is the Renewal of crediting period with the start date of second crediting period as 08/05/2021, which is more than 2 years from the date of survey. Kindly clarify how the monitoring frequency has been followed.				
CME response				Date: 28/04/2021

While reassessing the baseline as per requirement during the crediting period renewal of the PoA both in CDM and GS, the latest available survey was from 2017/18. The outcome of the survey was taken for the assessment of the baseline and was approved by both CDM and GS (Please see CDM and GS PoA-DD). Since baseline scenario are fixed for the PoA and same is applied for the corresponding CPAs for the second period of PoA, the issue of monitoring frequency has no any linkage in this stage for the validation. Appropriate monitoring frequency for the parameters to be monitored are clearly mentioned in section B.7.1 of CPA-DD and will be followed during verification.	
Documentation provided by CME	
<i>CDM PoA-DD and GS PoA-DD applicable for the period.</i>	
VVB assessment	Date: 28/04/2021
The justification provided by CME was found to be acceptable. Hence, the finding is closed.	

Table 2. CAR from this validation

CAR ID	01	Section no.	4.1	Date: 17/04/2021
Description of CAR				
In the cover page of the VPA-DD, the time of first submission date and the date of design certification is not clear.				
CME response				Date:
The first submission date and the design certification date as per the VPA-DD template filling guideline are the submission of documents for the preliminary review and inclusion review last date respectively even if the issues were closed after the last date of first design review round. Based on this, the documents were first requested for registration review (then) on 3 rd July 2015 and last date of the first registration review was 14 August 2015. Based on that the dates are revised in the cover page of VPA-DD. For the proof of the date, please see attached SD#4.				
Documentation provided by CME				
<i>SD#4_GS Registration Review Period_3rd round_17.12.2015</i>				
VVB assessment				Date: 28/04/2021
The justification provided by CME was found to be acceptable. Hence, the finding is closed				

CAR ID	02	Section no.	4.3.7	Date: 17/04/2021
Description of CAR				
Under section B.7.1 of the VPA-DD, for the parameter “BC _{PJ,HH,y} ” and “B _y ”, CME has stated that “Though the				

methodology requires sample survey biannually”, however, the monitoring frequency is “biennially”. Hence, the same shall be corrected.	
CME response	Date: 28/04/2021
The description for the parameter “BC _{PJ,HH,y} ” and “B _y ” is corrected appropriately in revised VPA-DD under section B.7.1. Please see revised VPA-DD.	
Documentation provided by CME	
<i>Revised VPA-DD</i>	
VVB assessment	Date: 28/04/2021
The correction has been done in the revised VPA-DD. Hence, the finding is closed.	

CAR ID	03	Section no.	4.1	Date: 17/04/2021
Description of CAR				
In ER sheet, the start date and the end date of the crediting period mentioned is inconsistent with the VPA-DD.				
CME response				Date: 28/04/2021
The start date and end date of the crediting period is revised accordingly in revised ER sheet aligning with the VPA-DD.				
Documentation provided by CME				
<i>Revised ER sheet</i>				
VVB assessment				Date: 28/04/2021
The crediting period in the ER sheet has been revised and was found to be acceptable. Hence, the finding is closed.				

Table 1. FARs from this validation

No FARs raised during this validation.

FAR ID		Section No.		Date:
Description of FAR				
CME response				Date: DD/MM/YYYY



Documentation provided by CME	
VVB assessment	Date: DD/MM/YYYY



Annex 2: Certificate of Competence

Personnel Name:		Sanjay Kandari	
Qualified to work as:			
Team Leader	☒	Technical Expert	☒
Validator/Verifier	☒	Financial Expert	☒
Technical Reviewer	☒	Local Expert (India)	☒
Area(s) of Technical Expertise			
Sectoral Scope	Technical Area		
Energy Industries (renewable/non-renewable sources)	TA 1.1: Thermal energy generation from fossil fuels and biomass including thermal electricity from solar		
Energy industries (renewable/non-renewable sources)	TA 1.2: Energy generation from renewable energy sources		
Energy demand	TA 3.1. Energy Demand		
Waste Handling and Disposal	TA 13.1 Waste Handling and Disposal TA 13.2 Manure		
Approved by (Manager C & T)	Akhilesh Joshi		
Approval date:	11/12/2015		

Personnel Name:		Ms. Deboshmita Dey	
Qualified to work as:			
Team Leader	☒	Technical Expert	☒
Validator/Verifier	☒	Financial Expert	☐
Technical Reviewer	☐	Local Expert	☐
Area(s) of Technical Expertise			
Sectoral Scope	Technical Area		
Energy industries (renewable/non-renewable sources)	TA 1.2: Energy generation from renewable energy sources		
Waste Handling and Disposal	TA 13.1 Waste Handling and Disposal		
Approved by (Manager C & T)	Sanjay Kandari		
Approval date:	14/01/2021		



Personnel Name:		Sujan Adhikari	
Qualified to work as:			
Team Leader	☐	Technical Expert	☐
Validator/Verifier	☐	Financial Expert	☐
Technical Reviewer	☐	Local Expert (Nepal)	☒
Area(s) of Technical Expertise			
Sectoral Scope		Technical Area	
NA		NA	
Approved by (Manager C & T)		Gagandeep Kakkar	
Approval date:		05/05/2020	

Personnel Name:		Ms. Ananya Malik	
Qualified to work as:			
Team Leader (Trainee)	☐	Technical Expert	☐
Validator/Verifier- Trainee	☒	Financial Expert	☐
Technical Reviewer	☐	Local Expert	☐
Area(s) of Technical Expertise			
Sectoral Scope		Technical Area	
-		-	
Approved by (Manager C & T)		Sanjay Kandari	
Approval date:		07/12/2020	

Personnel Name:		Tushar Chaudhari	
Qualified to work as:			
Team Leader	☒	Technical Expert	☒
Validator/Verifier	☒	Financial Expert	☒
Technical Reviewer	☒	Local Expert (India)	☒
Area(s) of Technical Expertise			
Sectoral Scope		Technical Area	
Energy Industries (renewable/non-renewable sources)	TA 1.1: Thermal energy generation from fossil fuels and biomass including thermal electricity from solar		
Energy industries (renewable/non-renewable sources)	TA 1.2: Energy generation from renewable energy sources		
Energy demand	TA 3.1. Energy Demand		
Waste Handling and Disposal	TA 13.1 Waste Handling and Disposal		



Approved by	Manager Competency & Training
Approval date:	02/09/2020

History of the document

Version	Date	Nature of revision	Reviewed by	Approved by
6.0	20/02/2015	Revised For VVS 7.0	Manager CDM Quality 21/02/2015	Managing Director 24/02/2015
5.0	08/10/2014	Section 4.8.4 and 4.8.5 are revised based on the corrective actions proposed during the performance assessment.	Manager CDM Quality 13/10/2014	Managing Director 14/10/2013
4.0	29/07/2013	Revised for VVS 3.0 and 4.6 section added	Manager CDM Quality 04/08/2012	Managing Director 08/08/2013
3.0	05/09/2012	Revised for VVS track	Manager CDM Quality 07/09/2012	Managing Director 10/09/2012
2.0	31/12/2011	Comprehensively revised	Manager CDM Quality 31/12/2011	Managing Director 31/12/2011