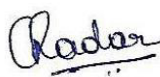


Validation report form for GS programme of activities

BASIC INFORMATION

Title of the programme of activities (PoA)	HomeBiogas Programme in Kenya (GS12063)
Version number of the validation report	02
Completion date of the validation report	17/01/2024
Version number of PoA-DD to which this validation report applies	Version 03 dated 30/12/2023
Coordinating/managing entity (CME)	Homebiogas Ltd.
Host Parties	Kenya
Applied methodologies and standardized baselines	GS Methodology: Methodology for Animal Manure Management and Biogas Use for Thermal Energy Generation, v1.1
Mandatory sectoral scopes	Sectoral Scope 1: Energy industries (renewable - / non-renewable sources)
Conditional sectoral scopes, if applicable	Sectoral Scope 13: Waste Handling and Disposal
Name and UNFCCC reference number of the DOE	4K Earth Science Private Limited UNFCCC Ref No: E-0069
Name, position and signature of the approver of the validation report	Chandrakala R  Managing Director

SECTION A. Executive summary

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4K Earth Science Private. Limited has been contracted by 'Homebiogas Ltd.' to perform a validation of the Gold Standard PoA ' HomeBiogas Programme in Kenya' (GS12063) in Kenya for registration of program of activities project.

The scope of the validation is defined as an independent and objective review and assess the GS PoA design document including VPA inclusion criteria, project's baseline study and monitoring plan ER calculation sheet and other relevant documents. The information in these documents is reviewed against the following documents:

- GS4GG Principles & Requirements (version 1.2)
- GS4GG Programme of Activity Requirements (version 2.0)
- GSGGG Community Services Activity Requirements (Version 1.2)

The report is based on the assessment of the PoA design document undertaken through stakeholder consultations, application of standard auditing techniques including but not limited to desk review, follow up actions (e.g., on site visit, electronic (telephone or e-mail) interviews) and also the review of the applicable approved methodological and relevant tools, guidance and CDM decisions.

The program of activity is to install bio digestors in rural households of Kenya. The program avoids non-renewable biomass (firewood) and methane generation from solid waste management to meet cooking and heating water requirement and will result in reduction of CO₂ emissions.

The review of the PoA design documentation and the subsequent follow-up interviews have provided 4KES with sufficient evidence to determine the project's fulfillment of all the stated criteria. In our opinion, the PoA meets all applicable GS requirements for the GS PoA.

- ☒ The PoA will be recommended to the Gold Standard with a request for registration as a GS PoA.
☐ The project is not recommended for renewal of crediting period

SECTION B. Validation team, technical reviewer and approver

B.1. Validation team members

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	Interview(s)	Validation findings
1.	Team Leader	IR	S R	Anand	Central	X		X	X
2	Technical Expert (1.1 & 13.1)	IR	Sharma	Chetan	Central	X		X	X
3	Team Member	IR	D V	Ganesh	Central	X		X	X
4	Team Member	IR	Babu S	Praveen	Central	X		X	X
5	Local Expert	ER	Muchomba	Kiria Edwin	Central	X	X	X	X

B.2. Technical reviewer and approver of the validation report

No.	Role	Type of resource	Last name	First name	Affiliation (e.g. name of central or other office of DOE or outsourced entity)
1.	Technical reviewer (1.1 & 13.1)	IR	Ma Paa	Puratchikkanal	Central
2	Approver	IR	R	Chandrakala	Central

SECTION C. Means of validation

C.1. Desk/document review

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The report is based on the assessment of the PoA and VPA design documents undertaken through stakeholder consultations, application of standard auditing techniques including but not limited to desk review, follow up actions (e.g., on site visit, electronic (telephone or e-mail) interviews) and also the review of the applicable Gold Standard approved methodological and relevant tools & guidance.

The validation is performed primarily as a desk review of the documents submitted at various stages of assessments. The review is performed by assessment team using verification protocols (checklists). The assessment team cross-checked the information provided in the PDD and information from sources other than those used, if available, and also conducts independent background investigations. 4KES conducted a desk review, involving but not limited to,

- A review of the data and information presented to verify their completeness;
- A review of eligibility of the project under Gold Standard
- A review of applicability of methodology
- A review of additionality of the project
- A review of the monitoring plan and monitoring methodology
- A review of calculations and assumptions made in determining the GHG data and emission reductions;

All the documents used for arriving validation conclusion are listed in Appendix 03 and referenced accordingly in validation report.

C.2. On-site inspection

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Duration of on-site inspection: 27/07/2023 to 28/07/2023				
No.	Activity performed on-site	Site location	Date	Team member
1.	Opening Meeting	Office	27/07/2023	Dr. Kiria Edwin Muchomba
2	Visit to beneficiaries households	Project Location	28/07/2023	Dr. Kiria Edwin Muchomba
3	Document Review & Closing Meeting	Office	29/07/2023	Dr. Kiria Edwin Muchomba

C.3. Interviews

No.	Interviewee			Date	Subject
	Last name	First name	Affiliation		
1.	Muthoni	Daniel	Homebiogas	27/07/2023,	- Roles and responsibilities

2.	Muthoni	George	Homebiogas	28/07/2023 & 29/07/2023	- End user agreement - Technical details - Baseline - Monitoring requirement - VPA inclusion criteria - Stakeholder consultation process - Data Analysis - Issues in the PoA-DD - Stakeholder Feedback round - General governance and implementation - VPA management
2.	Muthoni	Nathan	Homebiogas		
End users of VPA1					
No	Last name	First name	Family code	Date	Subject
1	Ansuyamma	Gureon	Thakwa	27/07/2023	- Verification of PP survey data - Awareness about ownership of VERs - Working condition of digesters - SDG parameters verification
2	Kaniv	Daniel	Thakwa	27/07/2023	
3	Kiombi	Joyce	Gitiha	27/07/2023	
4	Gucho	Jeremiah	Mungu	27/07/2023	
5	Worigres	Hannah	Thakwa	27/07/2023	
6	Karsingarim	Tabitha	Cichagi	27/07/2023	
7	-	Juash	Runur Dam	27/07/2023	
8	-	Annah	Naura	27/07/2023	
9	Wangui	Maomi	Pathitha	27/07/2023	
10	Vanjira	Jank	Gathwau	27/07/2023	
11	Njoroge	Peter	Gacharage	28/07/2023	
12	-	Cecialidua mbu	Sununi	28/07/2023	
13	Lkinu	Marthaw	Ndekere	28/07/2023	
14	-	Thomas	Ikuma	28/07/2023	
15	Thing	George	Kigango	28/07/2023	
16	Kinyanyeri	Joseph	Gatitub	28/07/2023	
17	Kitgwina	Joseph	Kiamuria	28/07/2023	
18	Mury	Jeremiah	Kagengo	28/07/2023	

C.4. Sampling approach

Not applicable

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

Areas of validation of compliance	No. of CL	No. of CAR	No. of FAR
Programme of activities	-	-	-
Identification of programme type	-	-	-
Description of PoA	1	1	-
Management system	-	-	-
Demonstration of additionality of PoA	-	-	-
Start date and duration of PoA	-	-	-
Local stakeholder consultation	-	1	-
Sustainable development Goals and outcomes	-	-	-

Safeguarding Principles Assessment	-	-	-
Eligibility criteria for inclusion of VPAs	-	2	-
Others (please specify)	-		-
Total	1	4	-

SECTION D. Validation findings

D.1. Programme of activities

Validation team has conducted a detailed desk review along with remote audit to find errors, inconsistency in data reporting, deviations from the methodology, etc. Validation team has raised certain CARs and CLs and sought the responses from the PP.

D.1.1. Identification of programme type

Means of validation	The PoA-DD was reviewed against the latest PoA-DD form in order to determine whether PoA-DD prepared using the valid version of ' KEY PROJECT INFORMATION & PROGRAMME DESIGN DOCUMENT (POA-DD)' Version 2.1 form applicable to the identified programme type and has followed all the relevant rules and guidelines The proposed PoA aims at avoidance fuel wood consumption by traditional stove users by disseminating biogas systems in the rural households of Kenya at subsidized price. This PoA finally reduces GHGs and contribute to SDG indicators. As per section 4.1.3 of GS4GG Principles & Requirements, v1.2, 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. The PoA applies GS approved methodology "Methodology for Animal Manure Management and Biogas Use for Thermal Energy Generation", v1.1".
Findings	No finding
Conclusion	Validation team confirms that the PoA followed the GS approved methodology and GS4GG Principles & Requirements, v1.2.

D.1.2. Description of PoA

Means of validation	Validation team reviewed all the submitted documents and interview with CME & beneficiaries team has assessed the all the necessary completeness of the PoA DD. The validation team has checked that section A.1 of the PoA-DD has been fully completed as per the applied PoA-DD template instructions. Overall objective of the PoA is to reduce GHG emission biogas systems in the rural households of Kenya. Implementation of biogas units for cooking purpose will reduce the amount of fuel wood/Charcoal used for cooking and water heating and will replace inefficient traditional cooking stoves with cleaner biogas stoves. Hence, it will reduce CO₂ emission from burning of non-renewable biomass for cooking and water heating. This technology will also reduce methane (CH₄) emissions from cattle manure and will contribute strongly to the sustainable development of the rural households involved in the project. <u>Framework for the implementation of the proposed PoA</u> The PoA is a voluntary initiative of Homebiogas Ltd., who will act as Coordinating and Managing Entity (CME). The CME will provide fund and involve in implementation of all the VPAs under the POA directly or with the help of an
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implanting agency. Other partners such as implementing agency may be included at the VPA level. Homebiogas Ltd. will coordinate on GS-related activities, particularly coordinating the PoA registration and VPA inclusions and verification. Implementation partner will be responsible for identification of eligible beneficiaries, collection of beneficiary details through app, distribution, commissioning and monitoring of the project.

The validation team found that there was no law or regulation that forces to disseminate biogas by means of interview with the CME and review of relevant laws & regulation published by relevant authorities. Therefore, it is found that the PoA is a voluntary action undertaken by the CME.

The validation team through interviews with stakeholders & CME confirmed that project promote and contributes to sustainable development of the project area. The project contributes to the following SDG parameters.

SDG	Assessment
SDG 1: No Poverty	In the baseline households are using traditional stove which are less efficient and required frequent maintenance. Project provides an opportunity to households to access basic services, ownership and appropriate new biogas technology. The biodigester provided to each household is more efficient and it requires less maintenance compared to the baseline stove. Therefore, each household participating the project activity will not only have access to clean cooking devices but will also have less maintenance issues due to an appropriate improved household size biogas model. The biogas units will be fully owned by each household participating in the proposed project activity. The biogas units will also result in savings through either spend on firewood purchase or using the time saved from firewood collection for revenue generating activities. Hence the project contributes to SDG 1.
SDG 2: Zero Hunger	The project proponent train the farmers to use the biodigester slurry as fertilizer. As a fertilizer, bio-slurry is better than compost manure or fresh manure, because nitrogen in bio-slurry is more easily absorbed. As the dung is in digested form, the nutrition are in available format. Hence, application of slurry will improve the agricultural productivity. Various studies ¹ also confirms the biogas slurry is a better fertilizer compared to direct application of dung and thereby increasing the agriculture productivity. Hence project contributes to SDG 2.
SDG 3: Good health and well being	In baseline the households in the project area uses polluting fuels such as fire wood and charcoal in less efficient conventional cook stove for cooking which lead to indoor air pollution. The indoor air pollution will lead to respiratory and eye problems especially for woman. The project will replace the conventional cooking stove with biogas which results in complete reduction of indoor pollution. The project activity will reduce the number of deaths and illnesses from indoor air pollution by providing access to biogas (clean cooking technologies). The women will specifically benefit from the project activity due to clean environment for indoor cooking and also reduced burden to collect/buy firewood for cooking.

¹ <https://ijsrset.com/paper/2205.pdf>

<https://www.sciencedirect.com/science/article/pii/S2666049021000025>

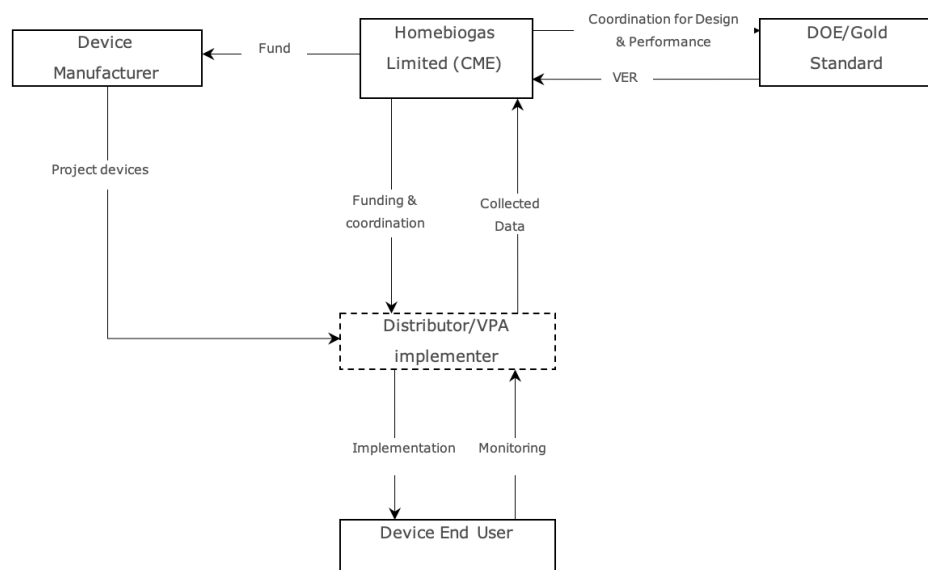
<https://edepot.wur.nl/307735>

		Hence the project contributes to SDG 3.
	SDG 5. Gender Equality	In Kenya, mostly fuel wood collection and cooking is performed by the women in the family. The fuel wood collection and cooking in the traditional cook stoves takes lot of time. By using the biogas cook stove, women save considerable amount of time in fuel wood collection and cooking. This also avoids vessel cleaning time as there is not soot deposition in the vessels when cooking in biogas. Hence project contributes to SDG 5
	SDG 7: Affordable and Clean energy	The proposed project activity with clean cooking units for each participating household, therefore it directly ensures access to an affordable, reliable and cleaner form of energy for daily cooking demand of each of these households.. Hence project contributes to SDG 7.
	SDG 8: Decent work and economic growth	The project will create at least 60 jobs in the project region. The programme will also train many local people in biogas technology. The trained biogas technicians will be permanently employed by the CME. Hence project contributes to SDG 8.
	SDG 13: Climate Action	The project will reduce GHG's emissions by two approaches, firstly by replacing the use of firewood by biogas for daily cooking needs. Secondly using the available animal dung in the biodigester, which otherwise would have dumped and left to decay leading to methane emissions. Hence project contributes to SDG 13.
	SDG 15: Life on Land	The project beneficiaries are highly dependent on firewood for daily cooking which is predominantly non-renewable in nature. The use of the biogas for cooking will reduce the use of firewood and decrease in the use and demand of wood, which will eventually lead to sustainable forests in the project area. Hence project contributes to SDG 15
The validation team has assessed the proposed PoA's geographical boundary, which is the host country, Kenya. It was checked and confirmed by reviewing the PoA-DD, interviews with CME and implementing agency. Technology/measure : The project activities under the proposed PoA promote biogas technology in rural households of Kenya which reduces fuelwood consumption. Introduction of household biodigester along with the stove is expected to displace the use of non-renewable biomass and/or other fossil fuel. The biodigester will utilise cattle dung and convert it into renewable energy by means of anaerobic digestion of the waste . In each household, a family-size biodigester together with a biogas-based cooking stove will be installed. The VPAs under the PoA can use any type of family size bio-digester. (The capacity of the biodigester will vary depending on the need of the family. The biogas unit size for a particular household will be chosen based on various parameters such as cooking requirement, family size, cattle availability, etc. The digester will be fed with cattle dung and water on a daily basis. The dung and water/wastewater remain in the chamber for approximately 30 days and breaks down anaerobically producing biogas. This biogas builds up above the slurry and remains in the chamber until it is released through the gas outlet pipe at the top of the digester when the gas burner in the household is turned on (the pipe at the top of the biodigester leads to the cooking stove in the household). The biodigester also produces slurry which is pushed into the outlet as the biogas builds up in the digester and finally exits		

	through the slurry discharge. The digested slurry is nutrient rich and therefore can be used organic manure by the farmers. The technology has been tested and widely used in Kenya. Scale of the PoA : The PoA is a large scale PoA. VPAs under the PoA will be large-scale projects. No legal, environmental, ecological and social regulations in Kenya prevent implementation of biodigesters in the rural households. Hence, the VPAs under the PoA will be in compliance with Host Country's legal, environmental, ecological and social regulations.
Findings	CL-01 & CAR-01 are raised and closed satisfactorily
Conclusion	Validation team confirms that PoA-DD contains a clear description of the PoA including the framework for implementation of PoA, policy/measure or stated goal of the PoA, applies GS approved methodology and all information provided in the section is accurate and followed all the necessity rules and guidelines.

D.1.3. Management system

Means of validation	The validation team reviewed the description of the operational and management system of PoA in PoA-DD to determine whether the CME established implementation and management system of PoA including process of inclusion of VPA, procedure to avoid double counting, records control, measures for continuous improvements of the PoA management system. Interview with relevant personnel was conducted to check the organisation structure of the PoA and conducted interview with relevant personnel. Homebiogas Ltd. is the CME of this project. The CME will provide fund and involve in implementation of all the VPAs under the POA directly or with the help of an implanting agency. Other partners such as implementing agency may be included at the VPA level. Homebiogas Ltd. will coordinate on GS-related activities, particularly coordinating the PoA registration and VPA inclusions and verification. Implementation partner will be responsible for identification of eligible beneficiaries, collection of beneficiary details through app, distribution, commissioning and monitoring of the project. With thorough review of the documents and with the interviews with CME, implementation agency, validation team finds that CME has a well-defined management system for monitoring each VPA including monitoring and archiving data, QA/QC procedures, data recording, etc. The following diagram represents the currently planned management structure of the PoA applicable. This structure may still be amended and adapted for each VPA.
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VPA Inclusion Management System

The CME has prepared a VPA Inclusion Management System that satisfies all criteria as outlined in para 5.12 of 'Programme of Activity requirements and procedures v.2.0.

a) Roles and responsibilities

The CME has the competencies to check the features of potential VPAs and ensure that each VPA meets the eligibilities criteria. There will be a person in the CME taking the final decision on VPA inclusions and coordinating monitoring and data management, for example, coordinating the numbering system of project devices (biodigester) under the different VPAs to avoid double counting.

b) Training and capacity development

The CME coordinates training for all the staff and external VPA implementers, if any. Training is needed to ensure that device implementation/distribution occurs in accordance to the requirements of the PoA and particularly that monitoring activities are conducted as per requirements.

c) Procedure for technical review of VPA inclusion

Each VPA to be included into the PoA will be checked by the CME against eligibility criteria. The responsible person at the CME will check the following:

1. Overall general completeness of the VPA documentation (technology, institutions involved, additionality, etc.)
2. Technical review of the proposed VPA, focused on:
 - technology and baseline
 - integration in centralized monitoring system
 - GS eligibility criteria
 - VPA inclusion criteria provided in the PoA-DD

d) Double counting

In each VPA-DD it will be stated that the VPA has not been and will not be registered neither as a single CDM/GS project activity nor as a VPA under another PoA. As per CME a unique numbers will be allocated to each project devices implemented under the PoA that allow unique identification and tracking of the project device. Based on the serial numbers, a device can only count in one VPA. This mechanism avoids any double counting within the VPA and outside the VPA.

e) Records and documentation control process for each VPA under the PoA

The CME will define a numbering system for project devices to be. The unique numbers allocated to each device under the PoA allow unique identification and

	tracking of the stove. An electronic record keeping system will be operated and maintained for each VPA under the PoA, which contains at least the following information per VPA: - Name and ID of the VPA - Date of inclusion of the VPA - Start of VPA crediting period - A database including all devices distributed, specifying - Technology deployed - Details of the agents/institutions distributing project device at the local level for the VPA - Serial numbers (device-ID) and user data of the devices belonging to the VPA - Date of distribution/installation - End users name, address & mobile number - Size/capacity of the digester for biogas VPA. The record keeping system will be updated as per the progress of the VPA. The complete project data including the digester installation database, baseline data, monitoring data, repair & maintenance data etc, VPAs under the PoA will be recorded electronically by Homebiogas Ltd. The field staff will update the project data as and when the data is collected. To ensure the accuracy of the data the management team regularly cross-verify the data collected by the field staff. All the data will be also accessible by the project manager. The database will be maintained by the CME. CMEs may annually check the systems to ensure: ▪ That the recorded address at which the devices are installed is still correct or update the address in the database if changed ▪ That the devices are still operational (as part of the monitoring procedure), That serial numbers are unique and the number in the database complies with the numbers on the devices Data will be kept for the whole crediting period of the VPA and an additional two years. f) Continuous improvements of the PoA management system On an annual basis, the CME will undertake the review of the overall PoA management system, including identifying any problems with VPA inclusion or coordination of project device distribution or monitoring. This review will take place during the verification and monitoring stage that will help the CME in obtaining an outside perspective of the overall management process.
Findings	No finding
Conclusion	Validation team confirms that the PoA meets all the management implementation requirements to achieve the objective of the project activity.

D.1.4. Demonstration of additionality of PoA

Means of validation	The additionality is determined at PoA level and as per GS4GG PoA requirements, CME has additionally criteria in VPA inclusion criteria. Additionality of the VPAs will be assessed in the respective VPA-DD as per the requirements of the Section 4.1.9 of the GS4GG Community-Services Activity Requirements v1.2. The information provided in the PoA-DD was cross-checked by means of document review of supporting documents and interview with the CME. Additionality of PoA : The validation team noted that there are no law or regulation that force to disseminate bio digestors in project area. Thus, the activities under the PoA are found to be an action by the CME voluntarily. In section C of the PoA-DD, PP mentioned that the additionality of the VPAs will be assessed in the respective VPA-DD as per the requirements of the Section 3 of the applied methodology 'Methodology for Animal Manure Management and Biogas Use for Thermal Energy Generation', v1.1. This is found to be appropriate as the additionality of the VPA will be assessed in the respective VPA-DD.
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	Also in section B.3 of the PoA DD where PP also clearly mentions the additionality criteria as per the requirement of section 3 of the applied methodology 'Methodology for Animal Manure Management and Biogas Use for Thermal Energy Generation', v1.1 under the VPA inclusion criteria which are as follows.											
	<table><tr><th>No.</th><th>Eligibility Criterion</th><th>Description/ Required condition</th><th>Means of Verification/Supporting evidence for inclusion</th></tr><tr><td>6</td><td>Conditions to ensure that VPA meet the requirements for demonstration of additionality</td><td>As per the section 3.3 of applied methodology, the following condition shall be fulfilled: The VPA with biodigester technology should confirm the VPA solely composed of isolated units where the users of the technology/measure are households or communities or institutions and where each unit results in <=600 tonnes of emission reductions per year. (Community services activity requirements V-1.2 –Annex B - Positive list para 1.1.3) OR The additionality shall be proved as per most recent version of the UNFCCC additionality tools or any approved GS VER additionality tool.</td><td>Evidence for inclusion: The VPA-DD will provide justification by calculating the ER for the maximum size of digester</td></tr></table>				No.	Eligibility Criterion	Description/ Required condition	Means of Verification/Supporting evidence for inclusion	6	Conditions to ensure that VPA meet the requirements for demonstration of additionality	As per the section 3.3 of applied methodology, the following condition shall be fulfilled: The VPA with biodigester technology should confirm the VPA solely composed of isolated units where the users of the technology/measure are households or communities or institutions and where each unit results in <=600 tonnes of emission reductions per year. (Community services activity requirements V-1.2 –Annex B - Positive list para 1.1.3) OR The additionality shall be proved as per most recent version of the UNFCCC additionality tools or any approved GS VER additionality tool.	Evidence for inclusion: The VPA-DD will provide justification by calculating the ER for the maximum size of digester
	No.	Eligibility Criterion	Description/ Required condition	Means of Verification/Supporting evidence for inclusion								
	6	Conditions to ensure that VPA meet the requirements for demonstration of additionality	As per the section 3.3 of applied methodology, the following condition shall be fulfilled: The VPA with biodigester technology should confirm the VPA solely composed of isolated units where the users of the technology/measure are households or communities or institutions and where each unit results in <=600 tonnes of emission reductions per year. (Community services activity requirements V-1.2 –Annex B - Positive list para 1.1.3) OR The additionality shall be proved as per most recent version of the UNFCCC additionality tools or any approved GS VER additionality tool.	Evidence for inclusion: The VPA-DD will provide justification by calculating the ER for the maximum size of digester								
The validation team found that the above mentioned criteria for additionality is found to be appropriate and in line with the Section 3 of the applied methodology 'Methodology for Animal Manure Management and Biogas Use for Thermal Energy Generation, v1.1												
Findings	No finding											
Conclusion	The validation team confirms that the additionality demonstration in the PoA-DD is complete and in line with relevant tools/guidelines. In addition, the additionality requirements have been developed as eligibility criterion for VPA inclusion in the PoA, thus ensuring that each VPA included in the PoA is additional and would not occur in absence of PoA.											

D.1.5. Start date and duration of PoA

Means of validation	The validation team checked whether the CME specified the start date of the PoA, duration of the PoA are in accordance with the applicable requirements in the PoA. The details provided in the PoA-DD are: Start date of PoA: 01/02/2022 (Start date of first VPA)
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	PoA Duration: 20 years Start date of PoA period: 01/03/2022 As per para 3.1.1 of GS4GG Programme of Activity Requirements-v1.2, the PoA start date is the date of the start date of the first VPA. As verified from the VPA-DD of VPA1, the start date of is 01/02/2022. This is the invoice date of 1st set of digesters implemented under VPA 1. The same is confirmed through verification of project database and the invoices for the VPA1. This is in line with the para 4.1.39 of principles & requirements which says “The Project start date is the earliest date on which the Project Developer has committed to expenditures related to the implementation of the Project”. Hence, the invoice date of the first batch of digesters (on which the biodigesters are also implemented) is considered as start date of VPA 1 which is found to be appropriate. Hence, the start date PoA considered by CME is correct. As per para 3.1.2 of GS4GG Programme of Activity Requirements-v1.2, the duration shall not exceed 20 years or the crediting period of first VPA/CPA plus 5 years, whichever is greater. Since the CME has considered PoA period of 20 years it is found to be acceptable.
Findings	No finding
Conclusion	The start date of PoA and the PoA duration have been validated and found to be correct and in line with GS4GG requirements.

D.1.6. Local stakeholder consultation

Means of validation	The validation team checked whether a local stakeholder consultation process was carried out at the VPA level or PoA level and the process in accordance with the applicable requirements in the PoA-DD. The validation team checked whether a local stakeholder consultation process was carried out at the VPA level or PoA level and the process in accordance with the applicable requirements in the PoA-DD. The local stakeholder consultation is conducted at the PoA level (Section F of the PoA-DD). Each VPA will be implemented in similar social economic situations. As detailed in the Stakeholder consultation report, the Stakeholder Consultation was conducted on 25th October 2022 at Reindeer Resort, Ting'ang'a, Kiambu, Kenya. The local stakeholders were invited through invitation and relevant government agencies, Policy makers, NGOs operating in the community development and energy, Gold Standard and Gold Standard supporter NGOs were invited through e-mails. Additionally the meeting was announced by a newspaper announcement. The supporting documents like invitation letters, e-mails, posters, photographs and videos are verified and found that the CME has made appropriate invitations to the all relevant stakeholders viz. local communities, local policy makers, official representatives, local NGOs, Gold Standard international NGOs and the DNA to attend the stakeholders meeting. As verified from the SCR, CME has followed the procedure as mentioned in Gold standard to conduct the stakeholder consultation process. All factors had been taken care and the same was confirmed during the interview and documentary evidences. The Stakeholder Consultation Report was reviewed by the validation team and it includes the non-technical summary which is consistent with project descriptions in the PoA-DD & SCR report. Invitation tracking table has been filled out and copies of the invitations published and sent out were cross-checked. This also includes the original copies of list of participants, stakeholder evaluation forms, meeting minutes and record of due accounts to address all comments received from the stakeholders. The participants were eager to see that the project was implemented early as it would help them / their dependents to get employment, improve quality of living. Comments from stakeholders were invited by CME. All the comments were satisfactorily explained by the PP to the stakeholder. No negative comments were received.
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	Also, an environmental impact analysis is not required (section E.2 of the PoA-DD). The stakeholders feedback round was open for 30 days from 25th July 2023 to 24th August 2023. Email announcements were sent to all the stakeholders whom were invited for stakeholder consultation meeting inviting them to comment on the revised reports. Web link to download Stakeholder Consultation Report and revised PoA-DD and VPA-DD have been provided. Also The Stakeholder Consultation Report and VPA-DD were made available at HomeBiogas office in Nairobi for local people without Internet access. No comments received during the commenting period.
Findings	No finding
Conclusion	Validation team confirms that the process for conducting the local stakeholder consultation was adequate and credible as per GS requirements and facts and documents submitted are properly referenced. The validation could confirm that Stakeholder consultation meeting meets the requirements of 'GS4GG Stakeholder Consultation and Engagement Requirements', version 1.2.

D.1.7. Sustainable development Goals and outcomes

Means of validation	PP has provided the assessment of project contributions to UN's Sustainable Development Goals (SDGs) in the section A of PoA DD and section B.6 of VPA-DD. In VPA-DD, PP claims the project contributes to the following sustainable development goals: a) SDG 1: No Poverty b) SDG 2: Zero Hunger c) SDG 3: Good health and well being d) SDG 5: Gender Equality e) SDG 7: Affordable and Clean energy f) SDG 8: Decent work and economic growth g) SDG 13: Climate Action h) SDG 15: Life on Land Validation team assessed the PPs claim on the contributions to the SDGs as below: <table border="1"> <tr> <td>SDG 1: No Poverty</td><td> In the baseline households are using traditional stove which are less efficient and required frequent maintenance. Project provides an opportunity to households to access basic services, ownership and appropriate new biogas technology. The biodigester provided to each household is more efficient and it requires less maintenance compared to the baseline stove. Therefore, each household participating the project activity will not only have access to clean cooking devices but will also have less maintenance issues due to an appropriate improved household size biogas model. The biogas units will be fully owned by each household participating in the proposed project activity. The biogas units will also result in savings through either spend on firewood purchase or using the time saved from firewood collection for revenue generating activities. The following parameters have been chosen as monitoring parameters for SDG1: - Proportion of population living in households with access to basic services Hence validation team confirms the project's contribution to SDG 1. </td></tr> </table>	SDG 1: No Poverty	In the baseline households are using traditional stove which are less efficient and required frequent maintenance. Project provides an opportunity to households to access basic services, ownership and appropriate new biogas technology. The biodigester provided to each household is more efficient and it requires less maintenance compared to the baseline stove. Therefore, each household participating the project activity will not only have access to clean cooking devices but will also have less maintenance issues due to an appropriate improved household size biogas model. The biogas units will be fully owned by each household participating in the proposed project activity. The biogas units will also result in savings through either spend on firewood purchase or using the time saved from firewood collection for revenue generating activities. The following parameters have been chosen as monitoring parameters for SDG1: Proportion of population living in households with access to basic services Hence validation team confirms the project's contribution to SDG 1.
SDG 1: No Poverty	In the baseline households are using traditional stove which are less efficient and required frequent maintenance. Project provides an opportunity to households to access basic services, ownership and appropriate new biogas technology. The biodigester provided to each household is more efficient and it requires less maintenance compared to the baseline stove. Therefore, each household participating the project activity will not only have access to clean cooking devices but will also have less maintenance issues due to an appropriate improved household size biogas model. The biogas units will be fully owned by each household participating in the proposed project activity. The biogas units will also result in savings through either spend on firewood purchase or using the time saved from firewood collection for revenue generating activities. The following parameters have been chosen as monitoring parameters for SDG1: Proportion of population living in households with access to basic services Hence validation team confirms the project's contribution to SDG 1.		

	SDG 2: Zero Hunger	The project proponent train the farmers to use the biodigester slurry as fertilizer. As a fertilizer, bio-slurry is better than compost manure or fresh manure, because nitrogen in bio-slurry is more easily absorbed. As the dung is in digested form, the nutrition are in available format. Hence, application of slurry will improve the agricultural productivity. Various studies² also confirms the biogas slurry is a better fertilizer compared to direct application of dung and thereby increasing the agriculture productivity. The following parameters have been chosen as monitoring parameters for SDG2: Number of farmers adopted practices promoted by the project Hence validation team confirms the project's contribution to SDG 2.
	SDG 3: Good health and well being	In baseline the households in the project area uses polluting fuels such as fire wood and charcoal in less efficient conventional cook stove for cooking which lead to indoor air pollution. The indoor air pollution will lead to respiratory and eye problems especially for woman. The project will replace the conventional cooking stove with biogas which results in complete reduction of indoor pollution. The project activity will reduce the number of deaths and illnesses from indoor air pollution by providing access to biogas (clean cooking technologies). The women will specifically benefit from the project activity due to clean environment for indoor cooking and also reduced burden to collect/buy firewood for cooking. The following parameters have been chosen as monitoring parameters for SDG 3 : Percentage of project population using polluting fuels . Hence validation team confirms the project's contribution to SDG 3.
	SDG 5. Gender Equality	In Kenya, mostly fuel wood collection and cooking is performed by the women in the family. The fuel wood collection and cooking in the traditional cook stoves takes lot of time. By using the biogas cook stove, women save considerable amount of time in fuel wood collection and cooking. This also avoids vessel cleaning time as there is not soot deposition in the vessels when cooking in biogas. The following parameters have been chosen as monitoring parameters for SDG 3 : Average time saving associated with cooking time and fuel collection Hence validation team confirms the project's contribution to SDG 3.
	SDG 7: Affordable and Clean energy	The proposed project activity with clean cooking units for each participating household, therefore it directly ensures access to an affordable, reliable and cleaner form of energy for daily cooking demand of each of these households. The following parameters have been chosen as monitoring parameters for SDG 7:

² <https://ijsrset.com/paper/2205.pdf>
<https://www.sciencedirect.com/science/article/pii/S2666049021000025>
<https://edepot.wur.nl/307735>

		Number of beneficiaries: Households. Hence validation team confirms the project's contribution to SDG 7.
	SDG 8: Decent work and economic growth	The project will create at least 60 jobs in the project region. The programme will also train many local people in biogas technology. The trained biogas technicians will be permanently employed by the CME. The following parameters have been chosen as monitoring parameters for SDG 8: Total Number of Jobs Hence validation team confirms the project's contribution to SDG 8.
	SDG 13: Climate Action	The project will reduce GHG's emissions by two approaches, firstly by replacing the use of firewood by biogas for daily cooking needs. Secondly using the available animal dung in the biodigester, which otherwise would have dumped and left to decay leading to methane emissions. The following parameters have been chosen as monitoring parameters for SDG 13: Amount of GHG Emission reduction. Hence validation team confirms the project's contribution to SDG 13.
	SDG 15: Life on Land	The project beneficiaries are highly dependent on firewood for daily cooking which is predominantly non-renewable in nature. The use of the biogas for cooking will reduce the use of firewood and decrease in the use and demand of wood, which will eventually lead to sustainable forests in the project area. The following parameters have been chosen as monitoring parameters for SDG 15: Total non-renewable wood fuel saved. Hence validation team confirms the project's contribution to SDG 15.
Findings	No finding	
Conclusion	a) The validation team confirms the proposed project will results in contributions to the SDGs 1, 2, 3, 5, 7, 8,13 and 15 b) Since the project contributes to more than three SDGs the validation team is in the opinion that the project is eligible under Gold standard as per GS4GG. c) All the parameters chosen to monitor the SDGs are found to be appropriate.	

D.1.8. Safeguarding Principles Assessment

Means of validation	PP has provided the assessment of safeguarding principles in the section E.2 of PoA-DD. The detailed assessment of safeguarding principle is provided below:	
	Safeguarding Principles	Assessment

	Human rights	The proposed PoA activity follows the human rights in accordance with the national legal framework. The project improves the livelihood of rural people and reduces the deforestation due to reduced usage of firewood. The PoA activity will not be put the human rights at risk. Hence, the project respects internationally proclaimed human rights including dignity, cultural property and uniqueness of indigenous people. The project is not complicit in Human Rights abuses.
	Gender Equality and Women's Rights	The project directly benefits to women and women's rights. The project directly contributes towards the gender policies as set forth in the GS4GG through provides positive economic and social incentives for full development of women; reducing the hardship of the women in cooking; providing fundamental freedom by women on equal basis with men; providing equal access to participation and decision making of women. . In summary, the project takes care of gender equality and women rights. CME confirms the same 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. The project does not adversely affect marginalised or vulnerable communities but in fact decrease the women burden of collecting firewood by providing a renewable and clean of energy cooking devices to meet their daily cooking and/or water heating needs. The target beneficiaries in the PoA are also from marginalised communities who do not have access to clean energy for cooking. The safeguarding assessment has been done transparently and it is confirmed that all the relevant stakeholders were involved in the process during the stakeholder consultation meeting, which was also confirmed at the time of audit.
	Community Health, Safety and Working Conditions	The use of biogas for cooking will avoid indoor air pollution by providing a clean environment for cooking. The project biogas system does not involve any hazardous material during construction and its operation. With the biogas system, users have access to cleaner fuel compared to fire-wood. In addition, fire-wood based cooking system has high indoor air pollution and a risk to fire-hazard. In comparison to that, biogas is clean smokeless fuel, and due to its maintained pressure there is no risk of any fire hazard or accident from the project activity. Hence, the project only leads to safe working conditions and improved in health of end users. 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.
	Cultural Heritage, Indigenous Peoples, Displacement and Resettlement	The project activity involves production of biogas using the biogas digesters and produced biogas will be used in the households primarily for cooking purpose (end use) for the thermal energy needs which

		are installed in households premises with the consent of beneficiaries. Before construction of the biogas units, the implementation team will ensure there is sufficient place to install the biogas units. Hence, the project does not involve and is not complicit in involuntary resettlement as verified during the site visit. The project activity does not involve alteration damage or removal of any critical cultural heritage as confirmed during the audit. The project involves installation of household biogas plants in rural households which does not require any specific permit or approval from any authority. The end users as owner of biogas system is taking part in the project activity with agreement to project developer to share benefits from the project to be developed as GS project. Hence, validation team concludes that there is no risk on cultural heritage by the project activity.
	Economic Impacts	The project is not labour intensive as it doesn't involve major construction works, employing labours is not within the scope of the project. Sustainable long, middle and short term jobs will be created. All workers will follow specific trainings on the implementation & repair of the project devices Thus, living conditions of the local population will be improved by job creation, stabilising rural families and generating new income. Workers are free join any organisation and working agreements with all individual workers will be documented and implemented. Signed contracts between CME/VPA implementer and all workers will be established and verified. All the project devices in the PoA will be provided at subsidised price. Monitoring team will be established under each VPA and it will take care of any repair & maintenance of the project devices. This will also reduce the fuel wood collection time and cooking time which will lead to generation of other income during the free time. Also, the operation does not involve any cost and hence the project will be self sustainable even without involvement of CME & implementer after the implementation. And secondly, the use of biogas slurry for agriculture will reduce their expenses on chemical fertilisers. Therefore, the PoA does not have any negative economic consequences. Therefore, there is no forced labour or child labour involved in the project activity. Kenya ratified ILO conventions C029 - Forced Labour Convention, 1930 and C105 - Abolition of Forced Labour Convention, 1957³. Therefore the safeguarding principle under discussion will not have negative impact.
	Environmental & Ecological safeguarding Principles	The project being implementation of household biogas system replaces fire-wood which leads to overall emission reductions. The energy supply is not hampered compared to baseline. And the operation of biogas units also reduces the methane emissions that

³https://www.ilo.org/dyn/normlex/en/f?p=NORMLEXPUB:11200:0::NO::P11200_COUNTRY_ID:103315

		would have occurred if the cattle-dung was left to decay in the traditional compost pits. The project involves use of household biogas system which does not need waste in huge quantity. There is no need to extract ground water or the project has requirement to affect the pre-existing pattern of watercourses. Water is only needed to mix with cattle dung to make the intake feed as liquid which is very minimal in quantity. Therefore, the project does not have any negative impact on water. The PoA is not linked to any other kind of activity other than implementation of the biogas units which might lead to erosion and/or water body instability. The project involves use of household biogas systems which does not involve any landscape modification or leads to vulnerable natural disasters. It also does not involve any manufacture, trade, release, and/ or use of hazardous and non hazardous chemicals and/or materials. The PoA does not modify the quantity or nutritional quality of food available. In fact, the manure put into a biodigester turns into slurry that can be utilised along with other agricultural wastes as an 'organic compost', to improve the soil fertility and in the long-term increasing the crop yields. The project devices are installed in the premises of the rural household. It does not physically affect or alter largely intact or High Conservation Value (HCV) ecosystems, critical habitats, landscapes, key biodiversity areas. PoA in long-term the project will help to restore the forest that can sustain various species of both plant and animals depending on this forest area. Hence, the principle is safeguarded by the project activity.
Findings	No findings	
Conclusion	All supporting information & reference sources stated in the PoA-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 no risk. Hence no mitigation measure is proposed.	

D.1.9. Eligibility criteria for inclusion of VPAs

By means of desk review of PoA-DD and interview with relevant personnel, the validation team assessed whether the eligibility criteria for inclusion of VPAs in the proposed GS PoA are defined in accordance with paragraphs GS4GG requirements and CDM validation and verification standard for programmes of activities.

Detailed assessment on the criteria provided in the generic VPA-DD in the PoA-DD is described as follows:

No.	Eligibility Criterion	Description/ Required condition	Description of the VPA in relation to the criteria, Means of Verification and Supporting evidence for inclusion	Assessment
1	Geographical boundaries of the VPA consistent with that of the PoA	The PoA boundary corresponds to the boundaries of Kenya. Each VPA will be located within Kenya.	The project will be installed in the Kenya. Hence, the VPA boundary is consistent with the geographical boundary set in the PoA Evidence: VPA-DD, section A.4 specifies location and boundary of the VPA.	Validation team confirms that the criteria and condition meets the GS PoA requirements and it is verifiable, objective and comprehensive to permit the assessment of the inclusion of corresponding VPAs in the PoA.
2	Conditions to avoid double counting of GHG emission reductions or net anthropogenic GHG removals, such as unique identifications of product and end user locations	A unique numbering system for devices (bio-digester) will be applied in each VPA, assigning a unique number to each device and allowing to clearly identify for each device to which VPA it belongs. Also, all the end user address will be recorded and maintained in the project database of each VPA.	Each biogas unit installed in the project will come with a unique id/number on it. The same id/number will be recorded in the CRM database. Also, End user address is recorded in the CRM database used by the CME. database, double counting shall be avoided.	Validation team confirms that the criteria and condition meets the GS PoA requirements and it is verifiable, objective and comprehensive to permit the assessment of the inclusion of corresponding VPAs in the PoA.
3	Conditions to check the start dates of VPA through documentary evidence	The construction start date of first digesters in the VPA shall be considered as start date of the respective VPA.	As per project database, 01/02/2022 is the construction start date of the 1st digester mentioned in the project database. This is matching with start date mentioned in VPA-DD. Evidence: Project database has been updated with construction start date of all digesters.	Validation team confirms that the criteria and condition meets the GS PoA requirements and it is verifiable, objective and comprehensive to permit the assessment of the inclusion of corresponding VPAs in the PoA.
4	Conditions to ensure compliance with the applicability of the applied methodologies, the applied standardized baselines and the other applied methodological regulatory documents	The livestock population in the farm is managed fully or partly under confined conditions;	The VPA shall ensure that the livestock are managed entirely in a confined conditioned through baseline survey Evidence: Baseline survey results.	Validation team confirms that the criteria and condition meets the GS PoA requirements and it is verifiable, objective and comprehensive to permit the assessment of the inclusion of corresponding VPAs in the PoA.
		Manure or the streams obtained after treatment are not discharged into natural water resources (e.g., river or estuaries);	VPA shall ensure manure is not discharged in the natural water-bodies and the same will be monitored during ex-post Evidence: The slurry application is included as monitoring plan in section B.7 of VPA-DD.	Validation team confirms that the criteria and condition meets the GS PoA requirements and it is verifiable, objective and comprehensive to permit the assessment of the inclusion of corresponding VPAs in the PoA.
		The annual average temperature of baseline site where anaerobic manure treatment facility is	The annual average temperature in Kenya is 25°C degrees Celsius which is higher than 5°C.	Validation team confirms that the criteria and condition meets the GS PoA requirements and it is

		located is higher than 5°C;		verifiable, objective and comprehensive to permit the assessment of the inclusion of corresponding VPAs in the PoA.
		In the baseline scenario, the retention time of manure waste in the anaerobic treatment system is greater than one month, and if anaerobic lagoons are used in the baseline, their depths are at least 1 m;	Through baseline survey VPA shall ensure average retention time of manure in pit/heap in the baseline condition is 1 year and the depths are 1 m or more. Evidence: Baseline survey results.	Validation team confirms that the criteria and condition meets the GS PoA requirements and it is verifiable, objective and comprehensive to permit the assessment of the inclusion of corresponding VPAs in the PoA.
		The baseline scenario should not involve methane recovery and destruction by flaring or combustion for gainful use.	There is no methane recovery in the baseline as the cattle dung is directly dumped in open pits. Evidence: Baseline survey results.	Validation team confirms that the criteria and condition meets the GS PoA requirements and it is verifiable, objective and comprehensive to permit the assessment of the inclusion of corresponding VPAs in the PoA.
		The storage time of the manure after removal from the animal barns, including transportation, should not exceed 45 days before being fed into the anaerobic digester. If the project developer can demonstrate that the dry matter content of the manure when removed from the animal barns is larger than 20%, this time constraint will not apply.	The manure is available from the cattle shed which is near to the house and the manure removal from the cattle shed and fed into digester on daily basis and hence there is no transportation and storage of feedstock involved Evidence: Baseline survey results.	Validation team confirms that the criteria and condition meets the GS PoA requirements and it is verifiable, objective and comprehensive to permit the assessment of the inclusion of corresponding VPAs in the PoA.
		A technical measure to ensure that the gas holding capacity of the biodigester is sufficiently large to capture the biogas during periods of non-usage. A justification to demonstrate compliance with this requirement pertaining to the biogas digester size shall be included in the Project Design Documentation (PDD).	The biogas is used daily for the household cooking. There are no non-usage days involved. Hence this condition is not applicable.	Validation team confirms that the criteria and condition meets the GS PoA requirements and it is verifiable, objective and comprehensive to permit the assessment of the inclusion of corresponding VPAs in the PoA.
		The activity is implemented by a project developer and can include additional project participants listed in Appendix 2 of the PDD template. The individual households may be represented collectively by community organisations, etc., but do not individually act as project participants	The CME is the project developer and no additional participants are involved. The contact details of CME is included in Appendix 2 of the PDD Evidence: Appendix 2 of PDD.	Validation team confirms that the criteria and condition meets the GS PoA requirements and it is verifiable, objective and comprehensive to permit the assessment of the inclusion of corresponding VPAs in the PoA.
		The developer must design incentive mechanism(s)5, which should be effective as fast as possible, for the displacing the use of inefficient baseline stoves	The baseline technology (3 stones stove or mud stove for firewood use) in the project activity will be replaced by the use of biogas for daily cooking. The biogas is a clean cooking	Validation team confirms that the criteria and condition meets the GS PoA requirements and it is verifiable, objective and comprehensive to permit the

		or cooking practices by the project cooking devices for daily usage and describe the incentive mechanism(s) in the PDD/VPA-DD at the time of validation.	technology which results in reduction in some, reduction in cooking time, fuel wood collection time & utensils cleaning time. This itself act as encouraging factor to use biogas system. Additionally, to encourage the complete removal of old technology, the biodigesters are given to the beneficiary at subsidized cost. Also, to assure the continuous use of the biogas, beneficiaries will be trained in maintenance of the system. Also, CME will do annual survey to check the usage of old technology and deduct the same from the emission reduction.	assessment of the inclusion of corresponding VPAs in the PoA.
		To avoid double counting or double claiming, the project developer must: a. clearly communicates its ownership rights and intention of claiming the emission reductions resulting from the project activity to the following parties by contract or clear written assertions in the transaction paperwork: all other project participants; project technology manufacturers; and retailers of the project technology; and b. informs and notify the end users that they cannot claim emission reductions from the project, and c. excludes from the project activity, any biodigester and cookstoves that are included in any other voluntary market or CDM or Article 6 based mechanisms project activity/PoA and strive not to displace the cooking devices of another CDM or voluntary project/PoA. See data and parameters not monitored (section 3.11), Avoidance of double counting or double claiming with other mitigation actions (BGTA 2), for details on this demonstration.	a. An end-user agreement has been signed with the beneficiary explaining in local language the ownership rights of the emission reductions resulting from the project. Evidence: End user agreement b. The end users have been notified about the emission reduction rights during the stakeholder meeting Evidence: LSC report c. The VPA, nor any of its devices is not yet registered and not being registered as a standalone CDM project by ensuring that the VPAs has the full title over the emission reductions generated by the users listed in the VPA. d. Evidence: Declaration on double counting	Validation team confirms that the criteria and condition meets the GS PoA requirements and it is verifiable, objective and comprehensive to permit the assessment of the inclusion of corresponding VPAs in the PoA.
5	Conditions to ensure that VPA meet the requirements for demonstration of additionality	As per the section 3.3 of applied methodology, the following condition shall be fulfilled: The VPA with biodigester technology should confirm the VPA solely composed of isolated units where the users of the	Each biodigester in the project will result in emission reduction less than 600 tCO ₂ e. Evidence: ER calculation sheet	Validation team confirms that the criteria and condition meets the GS PoA requirements and it is verifiable, objective and comprehensive to permit the assessment of the inclusion of corresponding VPAs in the PoA.

		technology/measure are households or communities or institutions and where each unit results in ≤ 600 tonnes of emission reductions per year. (Community services activity requirements V-1.2 –Annex B - Positive list para 1.1.3) OR The additionality shall be proved as per most recent version of the UNFCCC additionality tools or any approved GS VER additionality tool.		
6	Describe the technologies/measures to be employed and/or implemented by the real case VPAs and its regular VPAs, including a description of their common features	VPAs under this PoA will consist in the distribution of bio-digester to users cooking/ heating water with non-renewable biomass in the baseline scenario. The bio-digester will have a capacity of 2-3 m³ biogas generation per day.	The project involves distribution of bio-digesters to the users using the non-renewable biomass in the baseline. The biodigester to be distributed in the project activity will have capacity of 2-3 m³ biogas generation per day Evidence: The Section B.4 of VPA-DD confirms baseline scenario and section A.5 of the VPA DD specifies the type(s) bio-digester, capacity of digester including, among others, a description whether devices are fixed or portable and a specification of the capacity and approximated dimensions.	Validation team confirms that the criteria and condition meets the GS PoA requirements and it is verifiable, objective and comprehensive to permit the assessment of the inclusion of corresponding VPAs in the PoA.
7	Specification of the technology/measure, such as the level and type of service, as well as performance specification based on, inter alia, testing/certification;	VPAs under this PoA will consist in the distribution of bio-digester to users cooking/ heating water with non-renewable biomass in the baseline scenario. The bio-digester will have a capacity of 2.5 m³ biogas generation per day.	The project involves distribution of bio-digesters to the users using the non-renewable biomass in the baseline. The biodigester to be distributed in the project activity will have capacity of 2.5 m³ biogas generation per day Evidence: The Section B.4 of VPA-DD confirms baseline scenario and section A.5 of the VPA DD specifies the type(s) bio-digester, capacity of digester including, among others, a description whether devices are fixed or portable and a specification of the capacity and approximated dimensions.	Validation team confirms that the criteria and condition meets the GS PoA requirements and it is verifiable, objective and comprehensive to permit the assessment of the inclusion of corresponding VPAs in the PoA.
8	The PoA-specific requirements, including any conditions related to	The local stakeholder consultation is conducted at the PoA level (Section F of the PoA-DD). Each VPA will be implemented in similar social economic	The VPA is implemented in the rural households of Kenya which have similar social economic situation as described in the PoA-DD. Hence, the key stakeholders of	Validation team confirms that the criteria and condition meets the GS PoA requirements and it is verifiable, objective and comprehensive to permit the

	undertaking local stakeholder consultation and environmental impact analysis	situations. The key stakeholders of the program both at PoA and VPA level are the same. An environmental impact analysis is not required (section E.2 of the PoA-DD).	this VPA and PoA-level are same. Evidence: Section E of VPA-DD Also, as per the PoA-DD the environmental analysis is not required for this VPA.	assessment of the inclusion of corresponding VPAs in the PoA.
9	Conditions to provide an affirmation that funding from Annex I Parties, if any, does not result in a diversion of official development assistance	The CME and the VPA operator (in case of being different from the CME) shall confirm that in case of public funding, there is no diversion of Official Development Assistance.	The project will be completely funded by HomeBiogas. No ODA fund is involved in the project. Evidence: ODA Declaration.	Validation team confirms that the criteria and condition meets the GS PoA requirements and it is verifiable, objective and comprehensive to permit the assessment of the inclusion of corresponding VPAs in the PoA.
10	Target group (e.g. domestic/commercial/industrial, rural/urban, grid-connected/offgrid), and where applicable, distribution mechanisms (e.g. direct installation)	Target groups are domestic household who use traditional stoves for cooking and/or water heating with non-renewable biomass. The distribution mechanism is the direct distribution of devices (Biogas digester)	The target group of the VPA are the domestic households who use traditional stoves for cooking with non-renewable biomass Evidence: VPA-DD section A.1, describes the target groups. End user agreements template	Validation team confirms that the criteria and condition meets the GS PoA requirements and it is verifiable, objective and comprehensive to permit the assessment of the inclusion of corresponding VPAs in the PoA.
11	If the generic VPA applies sampling for the determination of parameter values for calculating GHG emission reductions or net anthropogenic GHG removals, conditions related to sampling requirements for the PoA in accordance with the "Standard: Sampling and surveys for CDM project activities and programme of activities"	No single sampling plan for all VPAs is proposed. If VPA-DD applies sampling for the determination of parameter values for calculating GHG emission reductions or net anthropogenic GHG removals then sampling plan will be provided in each VPA-DD in accordance with the "Standard: Sampling and surveys for CDM project activities and programme of activities"	Since the project is GS VER project, the sampling plan is described in Section B.7.2 of the VPA-DD in accordance with the Applied GS methodology 'Methodology for animal manure management and Biogas use for thermal energy generation, version 1 and "Standard: Sampling and surveys for CDM project activities and programme of activities" Evidence: VPA-DD, section B.7.2	Validation team confirms that the criteria and condition meets the GS PoA requirements and it is verifiable, objective and comprehensive to permit the assessment of the inclusion of corresponding VPAs in the PoA.
14	Awareness and agreement of those operating a VPA on PoA subscription	Where the VPA operator is different from CME, contractual provisions to ensure that those operating the VPA are aware and have agreed that their activity is being subscribed to the PoA.	Not applicable since there is no separate VPA implementor. The CME implements the project. Evidence:	Validation team confirms that the criteria and condition meets the GS PoA requirements and it is verifiable, objective and comprehensive to permit the assessment of the inclusion of corresponding VPAs in the PoA.
15	Monitoring plan	The monitoring plan of the VPA included under the PoA shall follow the	The Monitoring plan of the VPA in line with the methodology 'Methodology for	Validation team confirms that the criteria and condition meets the GS PoA

		requirements of applied methodology “Methodology for Animal Manure Management and Use of Biogas for Thermal Energy Generation”	Animal Manure Management and Use of Biogas for Thermal Energy Generation’ – V.1.0 & PoA-DD Evidence: Section B.7 of VPA-DD	requirements and it is verifiable, objective and comprehensive to permit the assessment of the inclusion of corresponding VPAs in the PoA.
16	Conditions to be met by each VPA regarding SDG outcomes assessment	The VPA shall confirm SDG contribution to minimum three SDGs out of targeted by the POA (ie, SDG 1, 3, 7, 8, 13 & 15). SDG13 shall be considered as mandatory	VPA confirms the contribution to SDG 1, 2, 3, 5, 7, 8, 13 & 15. This also includes the mandatory SDG 13. Evidence: Section B.6 of VPA-DD	Validation team confirms that the criteria and condition meets the GS PoA requirements and it is verifiable, objective and comprehensive to permit the assessment of the inclusion of corresponding VPAs in the PoA.
17	Conditions to be met for retroactive VPAs	If a retroactive VPA is added to the PoA, the VPA documents shall be submitted to preliminary review within one year of its start date	The project is a regular project. Moreover, the VPA documents are submitted to preliminary review within one year from start date of VPA. Evidence: Section C.1.1 of VPA-DD showing start date of the project.	Validation team confirms that the criteria and condition meets the GS PoA requirements and it is verifiable, objective and comprehensive to permit the assessment of the inclusion of corresponding VPAs in the PoA.

Sampling Approach:

CME did not propose single sampling plan for all VPAs. As per the eligibility criteria 11, the sampling plan will be provided for each VPA at VPA-DD if any parameters are monitored through sampling and hence assessment of sampling plant at PoA level is not required

Since, there is no single sampling proposed by CME, VVB do not foresee any of the following risks:

- (a) Risks related to the type(s) of project activity/ technology/ geographic location
- (b) Risks related to non-identification of emission and leakage sources
- (c) Risks related to double counting, especially in the case of distributed technologies.
- (d) Uncertainty with respect to the data monitored etc.
- (e) Risks related to environmental, economic or social safeguards
- (f) Risks on account of previous VPA/CPA having been erroneously included or other VPA/CPA facing significant grievances from local stakeholders or ongoing legal cases for existing CPA/VPA etc

Finding:

CAR-03 & CAR-04 are raised and closed satisfactorily

Conclusion:

Hence, from the above findings, validation team hereby concludes that the all the mandatory eligibility criteria as per GS requirements are included in the PoA-DD.

SECTION E. Internal quality control

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The validation report prepared by team leader is reviewed by an independent technical reviewer (having competence of relevant technical area himself/herself or through an independent technical area expert) to confirm the internal procedures established by 4KES are duly followed and the

validation report/opinion is reached in an objective manner and complies with the applicable GS4GG requirements.

The technical review team is collectively required to possess the technical expertise of all the technical area/sectoral scope the project activity relates to. All team members of technical review team are independent of the validation team. The independent technical reviewer(s) may approve or reject the draft validation report. The findings may be identified even at this stage, which needs to be satisfactorily resolved, before submit final report to Gold Standard. The final approval decision is taken by the Head of the VVB/Director.

The final decision is authorized by the Director, 4KES, once the report is finalized by the Head of the VVB/VVB Manager

SECTION F. Validation opinion

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4K Earth Science Private. Limited has been contracted by 'Homebiogas Ltd.' to perform a validation of the Gold Standard PoA 'HomeBiogas Programme in Kenya' (GS12063) in Kenya for registration of program of activities project.

The scope of the validation is defined as an independent and objective review and asses the GS PoA design document including VPA inclusion criteria, project's baseline study and monitoring plan ER calculation sheet and other relevant documents. The information in these documents is reviewed against the following documents:

The validation was performed in accordance with the UNFCCC criteria for the Clean Development Mechanism, latest version of Validation and Verification Standard, latest version of GS4GG Principles & Requirements, latest version of GS4GG Programme of Activity Requirements and related Standards/Guidance and host country criteria, as well as criteria given to provide for consistent project operations, monitoring and reporting. The review of the final PoA-DD and the subsequently performed follow-up interviews with representatives of the project participant has provided the validation team with sufficient evidence to determine VPA-DD compliance with the VPA inclusion criteria mentioned in the validated PoA-DD.

In our opinion, the PoA meets all relevant Gold Standard, UNFCCC and all relevant host country criteria.

Appendix 1. Abbreviations

Abbreviations	Full texts
4KES	4K Earth Science Private Limited
BE	Baseline Emissions
CAR	Corrective Action Request
CDM	Clean Development Mechanism

CER	Certified Emission Reduction
CL	Clarification request
CME	Coordinating/ Managing Entity
CPAI	Component of the Project Activity Implementer
CO ₂	Carbon dioxide
COP	Conference of Parties
DOE	Designated Operational Entity
DNA	Designated National Authority
DR	Document Review
EB	Executive Board
EF	Emission Factor
ERs	Emission Reductions
FAR	Forward Action Request
GHG	Greenhouse gas(es)
IPCC	Intergovernmental Panel on Climate Change
KP	Kyoto Protocol
LSC	Local Stakeholder Consultation
LE	Leakage Emissions
LoA	Letter of Approval/Authorization
ISO	International Organization for Standardization
MOP	Meeting of Parties
MoC	Modalities of Communication
MP	Monitoring Plan
NCV	Net Calorific Value
ODA	Official Development Assistance
PA	Project Activity
PoA	Program of Activity
DD	Design Document
PE	Project Emissions
PP	Project Participant
PS	Project Standard
QA/QC	Quality Assurance/Quality Control
RfR	Request for Registration
SCR	Stakeholder Consultation Report
SDG	Sustainable Development Goal
SSC	Small Scale
T&C	Technical & Certification
UNFCCC	United Nations Framework Convention on Climate Change
VPA	Voluntary Project Activity
VVS	Validation & Verification Standard

Appendix 2. Competence of team member and technical reviewers

<u>Certificate of Competence</u>		
Name	☒ Mr. ☐ Ms.	Anand S. R
Qualification	Fulfil the requirement as per the appointment of personnel procedure of 4KES	

Procedure	for Validation and Verification of CDM/VCS/GS/GHG Projects.					
Appointed to work as:						
	CDM Validator/Verifier	Team Leader	Team Member	Technical Expert	Technical Reviewer	Financial Expert
Appointed	Yes	Yes	Yes	Yes	No	No
Appointed Date	15-07-2023					
Authorized to work as Technical Expert for:						
Authorized Technical Area	Sectoral Scope	TA Code		Technical Area within the scope		
	Energy industries (renewable - / non-renewable sources)	1.2		Renewables		
	Energy demand	3.1		Energy demand		
	Manure	13.2		Manure		
Authorized to work as Local Expert for:						
Country/Countries	India					
Compliance check by: M P Kanal						

<u>Certificate of Competence</u>						
Name	☒ Mr. ☐ Ms.	Chetan Swaroop Sharma				
Qualification Procedure	Fulfil the requirement as per the appointment of personnel procedure of 4KES for Validation and Verification of CDM/VCS/GS/GHG Projects.					
Appointed to work as:						
	CDM Validator/Verifier	Team Leader	Team Member	Technical Expert	Technical Reviewer	Financial Expert
Appointed	Yes	Yes	Yes	Yes	Yes	No
Appointed Date	27-04-2021					
Authorized to work as Technical Expert for:						
Authorized Technical Area	Sectoral Scope	TA Code		Technical Area within the scope		
	Energy industries (renewable - / non-renewable sources)	1.1		Thermal energy generation		
	Energy industries (renewable - / non-renewable sources)	1.2		Renewables		
	Energy distribution	2.1		Energy distribution		
	Energy demand	3.1		Energy demand		
	Waste handling and disposal	13.1		Solid waste and wastewater		
	Waste handling and disposal	13.2		Manure		
Authorized to work as Local Expert for:						
Country/Countries	India					
Compliance check by: Anand S. R.						

<u>Certificate of Competence</u>		
Name	☒ Mr. ☐ Ms.	Praveen Babu
Qualification Procedure	Fulfil the requirement as per the appointment of personnel procedure of 4KES for Validation and Verification of CDM/VCS/GS/GHG Projects.	
Appointed to work as:		

	CDM Validator/Verifier	Team Leader	Team Member	Technical Expert	Technical Reviewer	Financial Expert
<i>Appointed</i>	Yes	No	Yes	Yes	No	No
<i>Appointed Date</i>	08-07-2022					
Authorized to work as Technical Expert for:						
<i>Authorized Technical Area</i>	Sectoral Scope		TA Code	Technical Area within the scope		
	Energy industries (renewable - / non-renewable sources)		1.2	Renewables		
Authorized to work as Local Expert for:						
<i>Country/Countries</i>	India					
Compliance check by: Anand S. R.						

<u>Certificate of Competence</u>						
Name	☒ Mr. ☐ Ms.	Ganesh Jithamanyu D V				
Qualification Procedure	Fulfils the requirement as per the appointment of personnel procedure of 4KES for Validation and Verification of CDM/VCS/GS/GHG Projects.					
Appointed to work as:						
	CDM Validator/Verifier	Team Leader	Team Member	Technical Expert	Technical Reviewer	Financial Expert
<i>Appointed</i>	No	No	Yes	No	No	No
<i>Appointed Date</i>	23-06-2022					
Authorized to work as Technical Expert for:						
<i>Authorized Technical Area</i>	Sectoral Scope		TA Code	Technical Area within the scope		
	Energy industries (renewable - / non-renewable sources)		1.2	Renewables		
Authorized to work as Local Expert for:						
<i>Country/Countries</i>	India					
Compliance check by: Anand S. R.						

<u>Certificate of Competence</u>		
Name	☒ Mr. ☐ Ms.	Kiria Edwin Muchomba
Qualification Procedure	Fulfils the requirement as per the appointment of personnel procedure of 4KES for Validation and Verification of CDM/VCS/GS/GHG Projects.	
Appointed to work as:		

	CDM Validator/Verifier	Team Leader	Team Member	Technical Expert	Technical Reviewer	Financial Expert
<i>Appointed</i>	No	No	No	No	No	No
<i>Appointed Date</i>	23-03-2023					
Authorized to work as Technical Expert for:						
<i>Authorized Technical Area</i>	Sectoral Scope	TA Code	Technical Area within the scope			
	-	-	-			
Authorized to work as Local Expert for:						
<i>Country/Countries</i>	Kenya					
Compliance check by: Anand S. R.						

<u>Certificate of Competence</u>						
Name	☒ Mr. ☐ Ms.	Ma Paa Puratchikkanal				
Qualification Procedure	Fulfils the requirement as per the appointment of personnel procedure of 4KES for Validation and Verification of CDM/VCS/GS/GHG Projects.					
Appointed to work as:						
	CDM Validator/Verifier	Team Leader	Team Member	Technical Expert	Technical Reviewer	Financial Expert
<i>Appointed</i>	Yes	Yes	Yes	Yes	Yes	No
<i>Appointed Date</i>	27-04-2021					
Authorized to work as Technical Expert for:						
<i>Authorized Technical Area</i>	Sectoral Scope	TA Code	Technical Area within the scope			
	Energy industries (renewable - / non-renewable sources)	1.1	Thermal energy generation			
	Energy industries (renewable - / non-renewable sources)	1.2	Renewables			
	Energy demand	3.1	Energy demand			
	Construction	6.1	Construction			
	Waste handling and disposal	13.1	Solid waste and wastewater			
	Waste handling and disposal	13.2	Manure			
	Agriculture	15.1	Agriculture			
Authorized to work as Local Expert for:						
<i>Country/Countries</i>	India					
Compliance check by: Anand S. R.						

Appendix 3. Documents reviewed or referenced

No.	Author	Title	References to the document	Provider
1	HomeBiogas	GS PoA DD	Version 1, dated 10/01/2023	HomeBiogas
	HomeBiogas	GS PoA DD	Version 2, dated 10/10/2023	HomeBiogas

	HomeBiogas	GS PoA DD	Version 3, dated 30/12/2023	HomeBiogas
2	HomeBiogas	GS VPA DD	Version 1, dated 10/01/2023	HomeBiogas
	HomeBiogas	GS VPA DD	Version 2.2, dated 10/10/2023	HomeBiogas
	HomeBiogas	GS VPA DD	Version 3, dated 30/12/2023	HomeBiogas
3	HomeBiogas	ER Estimation Sheet	Version 1	HomeBiogas
	HomeBiogas	ER Estimation Sheet	Version 2.2	HomeBiogas
	HomeBiogas	ER Estimation Sheet	Version 3	HomeBiogas
4	HomeBiogas	Baseline survey sheet of VPA1		HomeBiogas
	HomeBiogas	Revised Baseline survey sheet of VPA1		HomeBiogas
5	HomeBiogas	Stakeholder Consultation Report	Version 2.2, dated 10/10/2023	HomeBiogas
6	Gold Standard	Methodology for Animal Manure Management and Biogas Use for Thermal Energy Generation	Version 1.1	Publically available
7	IPCC	1. 1996 IPCC Guidelines for National Greenhouse Gas Inventories: work book 2. 2006 IPCC Guidelines for National Greenhouse Gas Inventories: work book 3. 2019 Refinement to the 2006 IPCC Guidelines for National Greenhouse Gas Inventories	Web Link	Publically available
8	UNFCCC	Kyoto Protocol (1997)	Web Link	Publically available
9	Gold Standard	Template: Key project information & VPA design Document (PDD)	Version 02	Publically available
10	UNFCCC	CDM Project Standard for programmes of activities	Version 03	Publically available
11	UNFCCC	Standard: Sampling and surveys for CDM project activities and programme of activities	Version 09	Publically available
12	UNFCCC	Guidelines for sampling and surveys for CDM project activities and programme of activities	Version 04	Publically available
13	UNFCCC	CDM Validation and Verification Standard for programmes of activities	Version 03	Publically available
14	UNFCCC	Glossary "CDM terms"	Version 10	Publically available
15	HomeBiogas	ODA Declaration letter		HomeBiogas
16	Gold Standard	Principles and Requirement	Version 1.2	Publically available
17	Gold Standard	Community Services Activity Requirements	Version 1.2	Publically available
18	Gold Standard	Programme of Activity requirements	Version 2.0	Publically available
19	Gold Standard	Safeguarding principles and requirements	Version 1.2	Publically available
19	Gold Standard	GS4GG preliminary Review report		HomeBiogas

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

Table 1. CL from this Verification

CL ID	01	Section no.		Date:	29/08/2023
Description of CL					
PP is to provide the proof for the below following,					
1. PP is to provide the ODA declaration 2. End user agreement 3. Local stakeholder consultation report 4. Employment record 5. Women employment record 6. Baseline survey results 7. Declaration on double counting					
Project participant response					Date: 10/09/2023
<i>The documents of VPA 1 are submitted</i>					
Documentation provided by project participant					
1. <i>The ODA declaration will be provided.</i> 2. <i>The end user agreement will be provided</i> 3. <i>The local stakeholder consultation report will be provided</i> 4. <i>The employment record will be provided</i> 5. <i>The women employment record will be provided</i> 6. <i>The baseline survey results will be provided</i> 7. <i>The declaration on double counting will be provided.</i>					
DOE assessment					Date: 15/09/2023
The requested documents relevant to VPA 1 are submitted by CME now. CL is closed					

Table 2. CAR from this validation

CAR ID	01	Section no.	A.4	Date:	29/08/2023
Description of CAR					
PP need to demonstrate scale of the project with proper calculation in the section.					
Project participant response					Date: 10/09/2023
<i>Scale of the project with proper calculation is added in the section A.3 of POA.</i>					
Documentation provided by project participant					
<i>Updated POA</i>					
DOE assessment					Date: 15/09/2023
CME provided the details about the scale of the project. CAR is closed.					

CAR ID	02	Section no.		Date:	29/08/2023
Description of CAR					
Provide a copy of Grievance Expression Process Book.					
Project participant response					Date: 10/09/2023
<i>A copy of Grievance Expression Process Book is provided</i>					
Documentation provided by project participant					
<i>Grievance Expression Process Book</i>					
DOE assessment					Date: 15/09/2023
Grievance expression book of VPA1 is submitted as reference.					

CAR ID	03	Section no.		Date:	29/08/2023
Description of CAR					

1. written assertions with the project developer of the ownership rights and intention of selling the emission reductions resulting from the project activity directed at or signed with all the applicable parties need to be provided. 2. Justification provided for the applicability conditions is not enough. Correction requested as per methodological requirements.	
Project participant response	Date: 10/09/2023
1 the end user agreements are signed with the beneficiaries for the project owner to have all the ownership & selling rights of the emission reductions 2 Added proper justification for the applicability conditions as per methodological requirements.	
Documentation provided by project participant	
1 End-user agreement 2 Updated POA	
DOE assessment	Date: 15/09/2023
The requested information is provided by CME. CAR is closed.	

CAR ID	04	Section no.		Date: 29/08/2023
Description of CAR				
1. What is the incentive mechanism used to eliminate the inefficient stoves needs to be explained. 2. Submit the database of the already implemented plants.				
Project participant response				Date: 10/09/2023
1 The biodigester are distributed by the project owner on incentivised basis. 2 The database of the already implemented plants will be provided.				
Documentation provided by project participant				
Database of VPA 1				
DOE assessment				Date: 15/09/2023
The requested information is provided now. CAR is closed.				

Table 3.FAR from this validation

FAR ID	xx	Section no.		Date: DD/MM/YYYY
Description of FAR				
NA				
Project participant response				Date: DD/MM/YYYY
Documentation provided by project participant				
DOE assessment				Date: DD/MM/YYYY