Validation report for the GS Design Certification Renewal of a Voluntary project activity

TÜVNORD

BASIC INFORMATION		
Title and GS ID of the programme of activities (PoA)	"African Biogas Carbon Programme (ABC) PoA" GS ID: 2747	
Version number and competion date of the validation report	2.0 05/08/2024	
Validation report ID	TÜV NORD P-No.: 8003061182 – 23/080	
Version numbers of PoA-DD, to which this report applies	9.2	
Title and GS ID of each VPA for renewal	VPA GS ID	**Title**
	4236	"African Biogas Carbon Programme (ABC) - Uganda - VPA003"
Sectoral scopes for each VPA	VPA GS ID	**Sectoral scopes (indicate mandatory and conditional sectoral scopes)**
	4236	Scope: 13/13.2 (conditional scopes: N/A)
Applied methodologies and standardized baselines for each VPA	VPA GS ID	**Applied GS methodology and standardized baselines (if any)**
	4236	"Methodology for animal manure management and biogas use for thermal energy generation", v1.1 Applied standardized baseline: N/A.
Number and duration of the next crediting period (CP)	VPA GS ID	**No. of CP:** / **Duration of the CP:**
	4236	2 (second) / 19/04/2022 - 18/04/2029 (including both days)
Coordinating/managing entity (CME)	Africa Bioenergy Programs Ltd (ABPL)	
Host Parties	The Republic of Uganda	
Estimated amount of annual average greenhouse gas (GHG) emission reductions or GHG removals by over the crediting period, per VPA	VPA GS ID	**Annual emission reductions or removals (tCO_2e)**
	GS4236	10,376
Name and UNFCCC ID of the VVB	TÜV NORD CERT GmbH, E-0022	
Name, position and signature of the approver of the validation report	TÜVNORD i. A. Digital unterschrieben von Kröger Anna Deputy Head of CP "JI/CDM" by TN CERT GmbH	

SECTION A. Executive summary

The Africa Bioenergy Programs Limited (ABPL) has commissioned the TÜV NORD JI/CDM Certification Program to carry out Gold Standard Design Certification Renewal (DCR) / re-validation for the project GS ID 4236: "African Biogas Carbon Programme (ABC) - Uganda - VPA003" with regard to the relevant requirements and procedures for GS Programme of Activities (PoA) / Voluntary Project Activities (VPA). The VPA was design certified on 11/06/2015 and included under the "African Biogas Carbon Programme (ABC) PoA" (GS ID: 2747). During the first crediting period, the VPA has been verified as follows:

Monitoring period	Duration	Verified Emission Reductions, tCO_2e	Status
#1	19/04/2015 – 31/08/2017	38,103	approved
#2	01/09/2017 – 31/03/2019	34,966	approved
#3	01/04/2019 – 30/04/2020	23,791	approved
#4	01/05/2020 – 30/04/2021	22,154	approved
#5	01/05/2021 – 18/04/2022	24,054	approved

The start date of the VPA is 11/11/2009. The first crediting period started on 19/04/2015 and ended on 18/04/2022. The second crediting period is being validated based on the updated PoA-DD, v9.2 and based on the (newly) applied GS baseline and monitoring metholdology "*Methodology for Animal Manure Management and Biogas Use for Thermal Energy Generation", v.1.1* in the course of the design certification renewal.

The objective of the VPA is to contribute to the Sustainable Development Goals (SDGs) through the dissemination of domestic biogas systems as a local, sustainable energy source and the development of a commercially viable, market-oriented biogas sector. The goal of the programme is to improve the livelihoods and quality of life of rural and peri-urban farmers in Uganda through utilizing the market and non-market benefits of domestic biogas.

The project activity involves the installation of different biodigester types with useful lifetimes between 7 and 35 years/TECH/.

The biodigerster sizes are 4 m^3, 6 m^3, 9 m^3, 12 m^3 and 13 m^3 in volume. The average thermal capacity of digesters approximately 13,285 units installed and in operation is 3.39 kWh_{th}, which is below the small-scale thermal threshold of 45 MWh_{th}. For further information, please see Section A.3 of the VPA-DD.

Biogas Solutions Uganda Ltd (BSUL) founded in 2014 by Africa Bioenergy Programs Limited is the VPA implementer responsible for coordinating, facilitating, and monitoring sector functions and supporting the technical, financial and institutional architecture necessary for development of the domestic biogas sector in Uganda.

A.1: Objective

The objective of this validation is the review by an independent entity whether the project is compliant with the applicable sections of:

- the Gold Standard for the Global Goals PoA Requirements and Procedures,
- the GS4GG Principles and Requirements,
- the GS4GG Safeguarding Principles & Requirements,
- the GS4GG Community Services Activity Requirements,
- the GS4GG GHG Emission Reductions & Sequestration Project Requirements,
- Gold Standard Gender Equality Guidelines and Requirements,
- the applied GS Methodology,
- other relevant rules, including the host country legislation.

A.2: Scope of Validation

As per the requirements of the Gold Standard for the Global Goals Principles and Requirements[/GS4GGPR/], a desk review and a remote audit have been conducted to verify the data submitted in the GS4GG VPA-DD. TÜV NORD confirms that the validation is based on: -

- the GS VPA-DD[/VPA-DD/],
- the GS PoA-DD[/PoA-DD/],
- the emission reduction calculation spread sheet[/XLS/],
- Baseline Survey,
- the SDG Monitoring Survey[/SMS/],
- referred publicly available information/data,
- further supporting documents made available to the validator as well as information collected through performing remote site interviews.

Details of the project location are given in table A-1 below:

Table A-1: Project Location

No.	Office Location
Host Country	The Republic of Uganda
Region:	The Republic of Uganda
Latitude:	4°12'53.79" to -1°28'19.22" N
Longitude:	29°34'17.52" to 35°2'33.81" E

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 VVB or outsourced entity)	Involvement in			
						Desk/document review	On-site inspection(Remote)	Interviews	Validation findings
1.	Team Leader & Validator	IR	Winter	Stefan	TN CERT GmbH	x	-	-	-
2.	Technical expert[1]	EI	Lubanga	David	-	x	x	x	x
3.	Host country expert / Trainee	EI	Mwikali	Joyce Mbuyta	-	x	x	x	x

[1] Assessment team member until 30/10/2023

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

No.	Role	Type of resource	Last name	First name	Affiliation (e.g. name of central or other office of VVB or outsourced entity)
1.	TR / Technical Expert	EI	Abarca A.	Víctor C.	TN Mexico
2.	TR / GS listed auditor	IR	Nuske	Alexandra	TN CERT GmbH
3.	TR / Approver	IR	Kröger	Anna	TN CERT GmbH

SECTION C. Means of validation

C.1. Desk/document review

During the desk review all documents initially provided by the client and publicly available documents relevant for the validation were reviewed. The main documents are listed below:

- the last revision of the PoA-DD/POA-DD/,
- the last revision of the PoA validation report/POA-VAL/,
- Draft version of the VPA-DD/VPA-DD/,
- Draft version of the emission reduction calculation spreadsheet/XLS/,
- the Baseline Survey,
- the verification documents/VER/ in its latest editoin.

Other supporting documents, such as publicly available information on the GS and SustainCERT websites and background information were also reviewed.

C.2. On-site inspection

The audit event within the validation process was planned in accordance with the guidance provided in the GS "Site Visit and Remote Audit Requirements and Procedures", v2.0. /Audit/ In particular, those requirements for audits, using remote audit techniques as well as the corresponding procedure and guidelines were taken into consideration.

At the beginning of the validation the TL has assessed the nature, scale and complexity of the tasks by carrying out a strategic analysis of all activities relevant to the assessment work. According chapter 3, see para 3.2.1. there /Audit/: "…a physical site visit by VVB is not mandatory at the validation, i.e. Design (change) Certification or Design Certification Renewal of the project". A minimum physical site visit is (also) not mandated as per GS4GG requiremensts/Site visit/ and not required / recommented as per VVB's previous audit findings. Further qualifying criteria (cf. para 6.3.1/Audit/) for initiating a remote assessment were fully fulfilled. Thus, carrying out validation audit applying remote assessment approach is a feasible option in this particular case, here: voluntary project activity seeking design certification renewal.

A detailed audit plan has been prepared and submitted to the project participant(s) in due time before the agreed date of remote audit. It lists activities, areas, information and personnel to be involved/interviewed in the remote assessment. The audit event was basically carried out as per the audit plan. All used audit techniques have been reported accordingly. For further details please refer to the subsequent sections of this Report.

Duration of on-site inspection:				
#	**Activity performed on-site**	**Site location**	**Date**	**Team member**
1.	Not applicable			
…				

C.3. Interviews

#	Activity performed	Site/location	Date	Team member

1.	Opening Meeting: Interviews with the ABPL , BSUL, Circodu team.	remote	07/10/2023	David Lubanga (DL) Joyce Mwikali (JM)
2.	Interviewing sampled Farmers	remote	16/10/2023	Joyce Mwikali
3	Interviewing sampled Farmers	remote	17/10/2023	Joyce Mwikali
4	Closing meeting/Summary of findings	remote	08/11/2023	Joyce Mwikali

No.	Interviewee			Date	Subject	Team member
	Last name	First name	Affiliation			
1.	Buysman	Eric	Consultant-BSUL	07/10/2023	Opening Meeting: introductions, confidentiality, validation scope, management system, document review, going through the VPADD, calculations and clarification in the findings report, biodigester specifications. Interviews with Field Survey team, interview with Baseline Survey team.	DL, JM
2.	Wahome	Salome	CME-operations (ABPL)			
3.	Arineitwe	Joseph	Dir.Circodu			
4.	Muvule	Michel	Program Dir. BSUL			
5.	Ninziima	Viola	M&E BSUL			
6.	Waweyo	Patrick	IT-Circodu			
7.	Ahimbisibwe	Isaac	Research Associate			
8.	Gabeya	Caroline	Data Collector-Circodu			

Interviews /IM/02

List of End Users interviewed		
No.	**Name**	**Location**
1	Fatumah Namiro	Wakiso District, Matuga village
2	Musinguzi Akiki	Kyenjojo district, Nyakatoke village
3	Rutasingwa Betty	Mukono district, Bukosa village
4	Jane Muhanguzi	Kiruhura district
5	Namubiru Ruth	Namusera ,Wakiso district
6	Namuhonja Scholastica	Mukono district, Kitete village
7	Bamutire Betty	Mukono district, Kauga
8	Nakitende Amina	Kilyagonja ,Wakiso district
9	Specioza Nabankeme	Wakiso district,Lubatu village
10	Kalenda Junik	Bunambale, Manafwa village

11	Wekoye Julius	Bududa district,Uhanyela cell
12	Mauda Barya Mwamishaki	Mitoma district
13	Sam Kisolo	Bukugu,Vukivole
14	Apollo Mugoonye	Silonko district
15	Muchunguzi Asaph	South West Uganda,Itojo parish , Mukono district
16	Hussein Sempebwa	Mpigi district,Kiwamirembe village
17	Hajjati Nabbosa Lukwayo	Butambala district,Kaalo village

C.4. Sampling approach

The Validation Team (VT) followed the "Standard for Sampling and Surveys for Gold Standard Voluntary Project Activities and Programme Activities" v9.0, para 29 to 32 for taking sample out of the PP's sample.
Due to the large number of baseline participants, the validation team has adopted the acceptance sampling approach (AS) in accordance with paragraph 29, 30, 31 to 32 of the Sampling Standard. VT invoked provisions of the para 32 of the applied standard to apply the producer risk and consumer risk as below:
The team considered an AQL 1% and UQL 20%, Producer risk of 10% and consumer risk of 10% for determination of the sample size for site assessment.

AQL	1%
UQL	20%
Producer risk	5%
Consumer risk	15%
Sample size	16
Acceptance Number	1
Total samples covered	17

Considering the above reference under applied sampling standard, the VVB should verify 16 samples under this approach with acceptance (c) number 1. The validation Team has validated total of 17 farmers (over sample) selected randomly from PP sample using Excel randomizer.

Questions for BFT survey participants on virtual site visit
• What stove and fuels do you currently use for cooking? • Did anyone/people visit from Circodu/EcoFrontiers to conduct a survey on type of stove and fuel consumption? • If yes, do you remember when it was? • Briefly explain how they did the survey. What questions were asked. • How many days was the survey? • Was your fuel weighed? Briefly explain the procedure and how many days it took to monitor your fuel consumption. • How much of the fuel (charcoal/fuel wood) do you use per day? • What are some of the challenges you face using the baseline technology /fuel.
Questions for Baseline survey participants on virtual site visit
• What animal types do you own. How many? • Do you practice zero grazing or are animals taken out to the fields to graze • How were you disposing of the manure prior to installing a biodigester? • Was all manure applied in the fields, or what other uses? • How do you use the bioslurry (coming out of the biodigester)?

Questions for BFT survey participants on virtual site visit
• Do you apply all the bioslurry in the field as fertilizer? Directly or dried out first. • What would you say are the benefits of using the bioslurry • Was a survey carried out to find out how you treated manure before, and how you use the bioslurry. If yes, do you remember when?

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

Area of validation findings (SECTION D)	No. of CL	No. of CAR	No. of FAR
VPAs to be renewed and corresponding generic VPAs	0	0	0
Compliance with VPA-DD form	0	1	0
Application and selection of methodologies and standardized baselines	0	3	0
Validity of original baseline or its update	0	0	1
Demonstration of eligibility of the VPAs	0	0	0
Estimated emission reductions or net anthropogenic removals	2	1	0
Validity of monitoring plan	0	2	0
Crediting period	0	0	0
CME and project participants	0	0	0
Post-registration changes	0	1	0
Others (please specify)	1	0	0
Total	**3**	**8**	**1**

SECTION D. Validation findings

D.1. Design Certification Renewal considering the following VPA(s):

Title and GS reference number of the VPA	Version number of the VPA-DD	Host Party	Version number of the PoA-DD on which the DCR is based
"African Biogas Carbon Programme (ABC) – Uganda –VPA003" (GS ID 4236)	2.6	Uganda	9.2

D.2. Compliance with VPA-DD form

Means of validation	The VPA-DD applies the correct version 1.1 of the GS VPA-DD form. All sections are completed as required by the VPA-DD template guideline. The validation team (VT) can confirm that the information transferred from the registered VPA-DD is materially the same. The following sources of information have been used in this context: • /VPA-DD/ • /PoA-DD/ • /VPA-DD-T/ • /gs/ • /VVS/	
Findings	☒	The latest reporting template VPA-DD form as listed on the GS website has been used for the VPA-DD.
	☐	The latest instructions for filling out the VPA-DD have been followed. No adverse finding has been identified in the course of this validation.
	☒	The respective requirements have widely been complied with. However in this context the following CARs, CLs, FARs have been raised: - CAR 01
Conclusion	☐	No CARs/CLs have been raised in this context. No correction was required in the context. The project is in line with the respective requirements.

	☒	The raised CARs/CLs have been addressed appropriately. The PP has carried out the requested corrections. All respective findings could be closed out. For details please refer to Appendix 4.
	Upon correction, the validation team has checked all sections of the VPA-DD and confirms by comparing the VPA-DD that the standardized GS VPA-DD template has been correctly applied.	

D.3. Application and selection of methodologies and standardized baselines

Means of validation

The updated VPA-DD complies with the revised GS methodology "*Methodology for Animal Manure Management and Biogas Use for Thermal Energy Generation", v.1.1*, which is in line with the updated PoA-DD.
All applicability conditions of the applied methodology have been met and the VPA design is in line with all requirements and stipulations mentioned in all sections of the applied methodology and the latest approved PoA-DD version 9.2. Besides, the VPA design is not expected to result in significant emissions related both to project and leakage, other than those listed in the methodology.

No.	Applicability Condition	Applicability	VVB assessment
1.	This methodology applies only to the fraction of the manure which would decay anaerobically in the absence of the project activity, which is established by a survey	The ER calculations are based on fraction of manure that would decay anaerobically in absence of the project activity and this is captured in parameter BGTA 12 and BGTA 8	The VT checked the ER calculations and confirms that they are based on fraction of manure that would decay anaerobically in absence of project activity.
2.	The methodology offers two methods for baseline emission quantification from AWMS. a. AWMS method 1 - IPCC Tier 1 approach, b. AWMS method 2 - IPCC Tier 2 approach	The VPA targets household farms and therefore Tier 1 is applied.	The VT checked the method of baseline emission quantification and confirms that Tier 1 method has been applied in the VPA-DD.
3.	The methodology is applicable under the following conditions when applying AWMS method 1: a. The category is limited to measures at individual households, small farms (e.g., installation of a domestic biogas digester) or livestock farms or institutional settings. b. The activity shall ensure that: i. The digestate must be handled aerobically. In soil application of the final digestate, proper conditions and procedures (resulting in negligible methane emissions) must be ensured. ii. The biogas captured from the biodigesters is utilised (e.g., combusted or burnt for thermal applications).	a) biodigester are installed at individual households, small farms (e.g., installation of a domestic biogas digester) or livestock farms or institutional settings b) The activity ensures that: i. Digestate is a potent organic fertilizer and used by the vast majority of the households as fertilizer. Households are encouraged to compost the digestate in case storage is necessary. Both systems are aerobic, see parameter BGTA 33 where this is monitored. ii. All biodigesters sold include a biogas stove to ensure effective and efficient use of gas for cooking ii.	The VT confirms through assessing the baseline data, the BFT data and the validation calls that the biodigesters are installed in individual households and small farms .

	4.	The methodology is applicable under the following conditions when applying AWMS method 2: a. The livestock population in the farm is managed fully or partly under confined conditions; b. Manure or the streams obtained after treatment are not discharged into natural water resources (e.g., river or estuaries); c. The annual average temperature of baseline site where anaerobic manure treatment facility is located is higher than 5°C; d. 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; e. The baseline scenario should not involve methane recovery and destruction by flaring or combustion for gainful use. f. 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. g. 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)	This VPA applies Tier 1 for household scale digesters. However, in case larger units are added for which method 2 is to be applied, the following conditions will be met: a. As per BGTA 8: there is a mix of AWMS, but all farmers have livestock that are managed fully or partly confined population. b. Bio-slurry is considered a valuable fertilizer, and discharge to natural water resources is therefore unlikely. Usage of bio-slurry is monitored under SDG2 including an examination of its usage. c. See BGTA 12, the annual average temperature is much higher than 5 d. The typical retention time is around 40 days. However, in case Tier 2 is applied, this will be justified in the MR. e. The baseline scenario is the situation prior to biodigester. Thus flaring is not possible, see BGTA 12 for the baseline scenario f. The period will be monitored in case Tier 2 is applied. g. For larger units, a technical measure to ensure that the gas holder capacity is sufficiently large will be demonstrated (Tier 2 only)	The VT confirms that this VPA has applied Tier 1 method of quantification by crosschecking the applied methodology against the ER calculations.
	5.	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 VPA is implemented by BSUL, the project developer. There are no additional participants.	The Validation Team confirms that BSUL is the Project developer for the VPADD and there is no other project participant.
	6.	The developer must design incentive mechanism(s), which should be effective as fast as possible, for the displacing the use of inefficient baseline stoves 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	The VPA implementer has set up an elaborative system to ensure that biodigesters are used effectively. This includes:	The VT checked the warranty sample of BUSL/46 which contains clause on ER claims ownership and training records provided by the CME. The CME has set up a grievance mechanism

			- Households trainings on biogas and bio-slurry use -Warranty of 1 year for technical issues (if identified, these are repaid at cost) - 100% of newly constructed plants are called by the client support center to ensure biodigesters are installed properly - Mandatory after sales physical visits by biodigester construction company to rectify potential issues and ensure proper use of biogas and bio-slurry - Grievance mechanism has been set-up for households to report issues	for farmers to report inace of any grievancies as in the reviewed VPA-DD.
	7.	To avoid double counting or double claiming, the project developer must: a. clearly communicate 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. inform and notify the end users that they cannot claim emission reductions from the project, and c. exclude 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. Captured in parameter BGTA1. b. End users of a biodigester are informed and notified that they cannot claim emission reductions. This is a standard clause in the warranty certificate. The certificates are retained at the household and digital copies are available in the data management system used called Salesforce. c. Captured in parameter BGTA 2	The VT checked the signed declaration by BSUL and a signed agreement between the CME and BSUL . The CME also provided a warranty certificate sample signed by the end user and technology providers.

The following sources of information have been used in this context:

- /VPA-DD/
- /PoA-DD/
- /IM01/
- /Meth/
- /gs/
- /WR/

Findings	☒	The applicability criteria of the applied methodology are met.
	☒	The respective requirements have widely been complied with. However in this context the following CARs, CLs, FARs have been raised: - CAR02, CAR04, CAR06
Conclusion	☐	No CARs/CLs have been raised in this context. No correction was required in the context. The project is in line with the respective requirements.
	☒	The raised CARs/CLs have been addressed appropriately. The PP has

		carried out the requested corrections. All respective findings could be closed out. For details please refer to Appendix 4.
	The validation Team confirms that the selected baseline and monitoring methodology has been approved by the Gold Standard, and is applicable to the Voluntary Project Activity, which complies with all the applicability conditions therein and the selected version is valid at the time of submission of the proposed PoA for renewal of crediting period. The methodology was changed for the second crediting period from Reduced Emissions From Cooking And Heating – Technologies And Practices To Displace Decentralised Thermal Energy Consumption, v1.0 (TPDDTEC) to Methodology for animal manure management and biogas use for thermal energy generation V1.1. The VPA-DD must also be updated to comply with the PoA-DD. It is also confirmed that the methodology is correctly applied by comparing it with the actual text of the applicable version of the methodology and there is no deviation from the selected methodology. No standardized bseline is applied.	

D.4. Validity of original baseline or its update

Means of validation

There are two baselines within the context of the project activity, as defined by the applied methodology: -

1. **AWMS**: The baseline scenario is the situation where, in the absence of the project activity, animal manure is left to decay anaerobically within the project boundary and methane is emitted to the atmosphere.

2. **Thermal Application**: The baseline is the fuel consumption of the thermal application used or that would have been used in the absence of the project activity times an emission factor for the fossil fuel and non-renewable biomass displaced.

Some of the data and parameters used for determining the original baseline, as determined ex ante are no longer valid. The CME has accordingly updated such data and parameters in accordance with applicable requirements of the new methodology, the CSA and the GS4GG VVS requirements.

The fraction of waste or raw materials that would decay anaerobically in the absence of the project activity is determined in the baseline survey (Parameter BGTA 6).

The baseline survey shall be conducted with a sample group of households/small farms with a 90% confidence interval and 10% margin of error. Refer to section 4.3.3 for minimum sample size for each baseline scenario.

In line with Section 4.3.3 of the applied methodology, the baseline survey should be carried out for each baseline scenario using representative and random sampling, following these guidelines for minimum sample size:

Group Size	Minimum sample size
< 300	30 or population size, whichever is smaller
300 to 1000	10% of group size
>1000	100

A baseline survey on non-project HHs was carried out from 13/11/2021 to 16/11/2021 and KPT conducted from 09/07/2023 to 31/07/2023 for each baseline scenario in the project area for the design certification renewal in line with the requirements of the applied methodology for animal waste management and and biogas application.

Two baselines were identified as follows;

Firewood

Charcoal

During remote calls, VVB asked HHs how they managed their animal waste and baseline fuel used for thermal applications prior to project activity. VVB cross-checked responses from HHs with the original baseline survey forms. VVB reviewed KPT and baseline results in Excel sheet for correct calculations and crossecked these results against data documented in the baseline and KPT survey forms for accuracy and completeness. VVB also reviewed KPT protocol used

and interviewd PD during online opening meeting, to confirm that correct KPT protocols are have been followed in line with Annex 2 guideline for Kitchen Performace Testing, in applied methodology, including correct sampling procedures. Moreover, the VVB team consulted the registered VPA-DDs to cross-check the that the new values are still reasonable in the context of the VPA.

The following are the ex-ante fixed parameters for the crediting period which will only be re-assessed at design certification renewal, as outlined in Section B.6.2 of the VPA-DD: -

Parameter	Value	Unit	Justification
BGTA 1: Avoidance of double counting or double claiming among project participants.	-	-	**Appropriateness of the value:** N/A **Purpose of the parameter:** Calculation of project outcome **Supporting Document:** warranty certificates **Conclusion:** VT checked signed sample warranty certificate BSU/46 dated 11/11/2009 and confirms that the warranty certificate contains a clause of ownership rights and intentions to sell emissions resulting from the project activity are transferred to the VPA implementer.
BGTA 2: Avoidance of double counting or double claiming with other mitigation actions.	-	-	**Appropriateness of the value:** N/A **Purpose of the parameter:** N/A **Supporting Document:** Applied methodology **Conclusion:** As per the methodology,this VPA has already been included with validated design and there is no review required as the parameter is undertaken at the time of VPA inclusion review.
BGTA 3: Regulatory framework for provision of animal waste management and thermal energy services.	-	-	**Appropriateness of the value:** The PP has demonstrated that the the Project does not undermine or conflict with any National ,subnational or local regulations as per GS requirements. **Purpose of the parameter:** calculation of baseline scenario **Supporting Document:** Draft National Energy policy 2019 pdf. **Conclusion:** The VT cross checked the draft National Energy policy 2019 pdf and cconfirms that the the Project is in support of the policy and therefore does not undermine or conflict with any National energy policy or regulations.
BGTA 4: Project technology description	-	-	**Appropriateness of the value:** The PP has provided a detailed description of the project of the biodigerster and the biogas stove and a manual haeen provided to the VT. **Purpose of the parameter:** calculation of project outcome **Supporting Document:** Biodigester manual

				Conclusion: The VT confirms that the project description provided by the PP is sufficient as per the GS reuirements and the applied technology.
	BGTA 5: Expected technical life of project technology.	Fixed dome-20	years	**Appropriateness of the value:** This value has been obtained from a reliable literature source as required by the methodology. **Purpose of the parameter:** calculation of project outcome. **Supporting Document:** FAO BEFS Rapid Appraisal – Biogas Community Component p8 **Conclusion:** The VT reviewed the literature source provided and confirmed that the source is authentic the value applied by PP is in line with the source**.**
	BGTA 6: Baseline scenario survey results		-	**Appropriateness of the value:** The values have been obtained from a baseline survey as per the GS requirements and applied methodology**.** **Purpose of the parameter:**calculation of baseline scenario **Supporting Document:** ER spreadsheet VPA03 CPII SDG database sheet BGTA6 cell B3:E38 **Conclusion:** The VT confirms that the PP conducted a baseline scenario survey in 2021 in line with the applied methodology and GS methodology. This was further confirmed through the remote validation calls to the farmers on 17/10/2023.
	BGTA 7: GWP_{CH4}	28	tCO_{2e} per tCH_4	**Appropriateness of the value:** This value has been obtained from IPCC as per the applied methodology. **Purpose of the parameter:** Calculation of baseline scenario and project scenario **Supporting Document:** IPCC AR5 report **Conclusion:** The VT cross checked applied methodology and confirms the value given for the IPCC AR5 is 28 and that the value applied has been correctly applied in line with the methodology**.**
	BGTA 3.5: CC	4	Wood to charcoal conversio n factor	**Appropriateness of the value:** VT checked Tool 33 Methodological tool: Default values for common parameters v 2.0 and confimed tha the alue applies is correct. **Purpose of the parameter:** calculation of project scenario

Supporting Document;

CDM Tool 33 Methodological tool: Default values for common parameters v 2.0.

Conclusion:

The default value applied is correct and valid.

BGTA 4: $MS\%_{BL,j}$

%

Ex-ante, will be updated for the first verification, see additional comments

Summary	Dairy cow	Other cattle	Growing swine	Breeding swine	Sheep	Goat	Poultry
Anaerobic lagoon	0%	0%	0%	0%	0%	0%	0%
liquid/slurry	3%	2%	4%	9%	0%	0%	6%
solid storage	42%	18%	9%	28%	0%	0%	1%
dry lot	37%	17%	56%	31%	14%	40%	45%
daily spread	8%	7%	22%	9%	26%	2%	13%
Pasture	8%	54%	5%	0%	46%	17%	31%
burned as fuel	0%	0%	0%	0%	0%	0%	0%
composting passive windrow	0%	0%	3%	15%	14%	40%	0%
another way	2%	2%	0%	7%	0%	0%	4%

Appropriateness of the value:
Baseline survey results in SDG database spreadsheet were checked for correctness against baseline underlying filled survey forms. Calculations were checked bin SDG spreadsheet by validation team for correct formulas and accurate calculation of values applied. VT confirms that survey results match data collected in survey forms and correct formulas are applied in the calculation of the parameter values in the SDG spreadsheet. VT thus confirms that the values determined are correct and valid.

Purpose of the parameter:

Calculation of baseline scenario.

Supporting Document:

Baseline survey results in SDG database spreadsheet.

Conclusion:

The parameter values have been applid in line methodological requirements.

BGTA 5: EF_{LT}

EF_{LT}	Dairy cow	Other cattle	Growing swine	Breeding swine	Sheep	Goat	Poultry
Uncovered Anaerobic lagoon	66.20	66.20	147.70	147.70	66.20	66.20	198.60
Liquid/ slurry pit > 1 month	51.40	51.40	114.60	114.60	37.45	37.45	154.20
Solid storage	4.40	4.40	9.70	9.70	4.40	4.40	13.10
Dry lot	1.70	1.70	3.90	3.90	1.70	1.70	5.20
Daily spread	0.90	0.90	1.90	1.90	0.87	0.87	1.61
Pasture	0.41	0.41	0.91	0.91	0.41	0.41	0.76
Burned as fuel	8.70	8.70	19.40	19.40	8.71	8.71	2.60
Composting passive windrow	2.18	2.18	4.86	4.86	2.18	2.18	4.02
Another way	0.90	0.90	1.90	1.90	0.41	0.41	2.40

$kgCH_4$ per animal per year for livestock type LT

Appropriateness of the value:

IPCC 2019 volume 4, chapter 10 table 10.14 has been checked and confiemed that the default values applied is correct.

Purpose of the parameter:

calculation of baseline scenario

Supporting Document: IPCC 2019 volume 4, chapter 10 table 10.14.

Conclusion:

The values have been correctly obtained and applied in calculation of baseline scenario in line with the methodology.

BGTA 6: $VS_{rate,LT}$

Dairy cow	15.2
Other cattle	12.7
Swine finishing	9.40
Swine breeding	6.00
Sheep	8.30
Goat	10.40
Poultry	13.00

kg VS / (1000 kg animal mass) / day

Appropriateness of the value:

The PP has applied default values from IPCC 2019 as per the methodology.

Purpose of the parameter:

calculation of baseline scenario

Supporting Document:

2019 IPCC guidelines for National Greenhouse Gas Inventories (kg VS / (1000 kg animal mass) / day)

Conclusion:

The default values have been correctly obtained from IPCC source and applied correctly in

				calculating the baseline scenario in line with the methodology..The VT confirmed this by cross-checking the applied methodology.
	BGTA 10a: $VS_{rate,by\ animal,LT}$	<table><tr><td>Dairy cow</td><td>4.104</td></tr><tr><td>Other cattle</td><td>3.429</td></tr><tr><td>Swine finishing</td><td>0.461</td></tr><tr><td>Breeding swine</td><td>0.246</td></tr><tr><td>Sheep</td><td>0.257</td></tr><tr><td>Goat</td><td>0.250</td></tr><tr><td>Poultry</td><td>0.012</td></tr></table>	kg VS / animal mass / day	**Appropriateness of the value:** VT checked table 10.13A of chapter 'Emissions from Livestock and Manure Management' under the volume 'Agriculture, Forestry and other Land use' of the 2019 IPCC Guidelines for National Greenhouse Gas) for the region Africa for correct default values applied and confirmed that the values have been correctly applied using correct formulas in calculation of the parameter values in SDG database and are thus appropriate. **Purpose of the parameter:** Calculation of baseline scenario **Supporting Document:** SDG database. 2019 1PCC GUIDELINES FOR National Greenhouse Gas inventories **Conclusion:** The values have been correctly obtained and applied in line with the applied methodology.
	BGTA 11: $B_{0,LT}$	<table><tr><td>Dairy cow</td><td>0.13</td></tr><tr><td>Other cattle</td><td>0.13</td></tr><tr><td>Swine finishing</td><td>0.29</td></tr><tr><td>Swine breeding</td><td>0.29</td></tr><tr><td>Sheep</td><td>0.13</td></tr><tr><td>Goat</td><td>0.13</td></tr><tr><td>Poultry</td><td>0.24</td></tr></table>	m^3 CH_4/kg-dm	**Appropriateness of the value:** The PP has applied IPCC default values as per the methodology. **Purpose of the parameter:** calculation of baseline scenario **Supporting Document:** 2019 IPCC Guidelines for National Greenhouse Gas Inventories volume 4 Chapter 10 **Conclusion**: the values are correctly obtained and applicable for method 2.
	BGTA 13: $EF_{b,i,CO2}$	Wood:112 Charcoal: 165.22 LPG: 63.1 Other fuels: IPCC defaults	tCO_2/TJ	**Appropriateness of the value:** The VT cross checked these values with the applied methodology and confirms that they are correct and are correctly applied in the calculation of values. **Purpose of the parameter:** Calculation of baseline emissions. **Supporting Document:** applied methodology **Conclusion:** The values are methodology defaults and are correctly applied in the project.
	BGTA 14: $EF_{b,i,non-CO2}$	Wood - 9.46 , 8.692 (AR4) Charcoal: 44.83 (AR5), 40.26 (AR4) LPG: 0.17 (AR5), 0.15 (AR4)	tCO_2/TJ	**Appropriateness of the value:** IPCC 2019 and applied methodology were checked for correct default values. VT confirmed that the default values applied are correct. **Purpose of the parameter:** Calculation of baseline scenario. **Supporting Document:** IPCC 2019 and applied methodology

				Conclusion: The applied values are default values and are correctly applied in line with the methodological requirments.
	BGTA 7: $EF_{p,i,CO2}$	**Wood**: 112 **Charcoal**:165.22 LPG: 63.1	tCO_2/TJ	**Appropriateness of the value:** VT checked IPCC 2006, volume 2, chapter 2 table 2.5 and the applied methodology for correctness of applied vaue and confirmed that the values applied are correct. **Purpose of the parameter:** Calculation of project emissions **Supporting Document:** IPCC 2006 Vol 2 and applied methodoly **Conclusion:** The applied values are default values and correctly applied in line with the methodological requirments.
	BGTA 16: $EF_{p,i,non\text{-}CO2}$	Wood-9.46 Charcoal-5.865 LPG- 0.17	tCO_2/TJ	**Appropriateness of the value:** VT checked IPCC 2019 guideline and the applied methodology for correctness of applied vaue and confirmed that the values applied are correct. **Purpose of the parameter:** Calculation of project scenario **Supporting Document:** applied methodology **Conclusion:** The applied values are default values and are correctly applied in line with the methodological requirments.
	BGTA 17: $NCV_{b,i}$	Wood: 0.0156 Charcoal:0.0295 LPG: 0.0473	TJ/ton	**Appropriateness of the value:** The VT checked IPCC 2006, volume 2, chapter 1 table 1.2 for correctness of values applied. It was confirmed that the vaues applied are correct. **Purpose of the parameter:** Calculation of baseline scenario **Supporting Document:** Applied methodology and IPCC 2006 vol 2, chapter 1 **Conclusion:** These values are methodological default IPCC values and are correctly applied in line with methodological requirements.
	BGTA 17: $NCV_{p,i}$	Wood: 0.0156 Charcoal:0.0295 LPG: 0.0473	TJ/ton	**Appropriateness of the value:** The VT checked IPCC 2006, volume 2, chapter 1 table 1.2 for correctness of values applied. It was confirmed that the vaues applied are correct. **Purpose of the parameter:** calculation of baseline scenario **Supporting Document:** applied methodology and IPCC 2006 vol 2, chapter 1.

			Conclusion: The applied values are methodology default values and have been correctly applied in line with methodological requirments.
BGTA 19: NCV_{biogas}	0.0215	GJ/m^3	**Appropriateness of the value:** VT checked the applied methodology for correctness of the applied value and confirmed that the value is correct. **Purpose of the parameter:** Calculation of baseline scenario **Supporting Document:** applied methodology **Conclusion:** The applied value is methodology default values and has been correctly applied in line with methodological requirments.
BGTA 20: $P_{b,i,y}$	Wood: 3.750 Charcoal 0.294 LPG: 0.045	tonnes/household/year	**Appropriateness of the value:** VT checked KPT results in SDG database against KPT survey forms for correctness, accuracy and consistency. The same was crosschecked against applied methodology for completeness and compliance. VT confirmed that KPT was correctly conducted in line with the applied methodological requirements, using the correct sample size and procedure and correct formulas were applied in the SDG database. Values applied are thus correct. **Purpose of the parameter:** Calculation of baseline scenario **--** **Supporting Document:** KPT, Sheet BE in VPA03 SDG database cell E74 and E79 **Conclusion:** All methodological requirements have been fully met in the determination of the applied parameter values.
BGTA 21: Percentage of fuel_i	Wood:75 Charcoal:25 LPG: - / N/A (No LPG in the baseline for CPII. So, as per the xls, it is not applicable)	%	**Appropriateness of the value:** VT checked SDG database results against baseline survey forms and applied methodology for correctness and consistency and completeness and compliance to methodological and GS requirements. VT confirmed that the values have been correctly obtained through baseline survey and all calculations apply correct formulas as checked in the SDG database. The applied values are thus suitably valid. **Purpose of the parameter:** Calculation of baseline scenario **Supporting Document:** VPA03 SDGdatabase **Conclusion:** This parameter is applicable for method 2.
BGTA 22: ηb,i,j	To be determined during monitoring.	fraction	**Appropriateness of the value:** As ouline in the applied methodology, VT confirms values will be determined during monitoring based on the correct methodology options indicated in the VPA-DD, applicable for Thermal application

				method 2. VT confirms validiy of these options, therefore. **Purpose of the parameter:** Calculation **Supporting Document: applied methodology** **Conclusion:** the parameter is applicable for method 2 and values will be determined during monitoring base of the valid methodological options indicated in the VPA-DD.
	BGTA 23: ηp,d,y	55	%	**Appropriateness of the value:** VT checked approved CPI VPA-DD and confirmed that the parameter value applied is correct and valid. **Purpose of the parameter:**calculation of baseline scenario **Supporting Document:** approved CPI VPA-DD **Conclusion:** The parameter is applicable for method 2 and there is no indication that methodological requirements for this parameter are not fully met.
	BGTA 41: $fNRB_{i,y}$	83.79	%	**Appropriateness of the value:** VT checked fNRB Uganda spreadsheet against CDM Tool 30 Methodological tool: Calculation of the fraction of non-renewable biomass and confirmed that all steps required by the ool have been correctly followed, sources of data used are credible and up-to-date, all parameters and formulas applied in the calculations are correct. The following assessment was made for each parameter used in the determination of fNRB: *MAIforest,i* Data indicated in the fNRB Uganda for this parameter was checked against the methodological tool (TOOL30) data sources seleted for correctness and accurate calculations of values and consistency of the values both in the data sources and the fNRB sprreadhseet. Assessment team confirmed that the values of % forest area & other wooded land obtained from Global Forest Resources Assessment 2000 by the FAO for "Distribution of total forest area by ecological zone" (Table 14) and values of above ground net biomass growth in natural forests, Africa in the 2019 Refinement to the 2006 IPCC Guidelines for National Greenhouse Gas Inventories for "Above-ground biomass growth rates for different ecological zones" (Chapter 4, Table 4.9), are correctly indicated in the fNRB Uganda spreadsheet. It was further confirmed that calculations used to determine the value of *MAIforest,I* in the fNRB Uganda spreadsheet are correct. Thus the value of this parameter indicated as 3.7 in the fNRB Uganda spreadsheet, is valid. *MAIother,i* Data indicated in the fNRB Uganda for this parameter was checked against the methodological tool (TOOL30) data sources seleted for

				correctness and accurate calculations of values in the fNRB sprreadhseet. Assessment team confirmed that the values of % forest area & other wooded land obtained from Global Forest Resources Assessment 2000 by the FAO for "Distribution of total forest area by ecological zone" (Table 14) and values of above ground net biomass growth in natural forests, Africa in the 2019 Refinement to the 2006 IPCC Guidelines for National Greenhouse Gas Inventories for "Above-ground biomass growth rates for different ecological zones" (Chapter 4, Table 4.9), are correctly indicated in the fNRB Uganda spreadsheet. It was further confirmed that calculations used to determine the value of *MAIforest,I* in the fNRB Uganda spreadsheet are correct. Thus the value of this parameter indicated as 3.7 in the fNRB Uganda spreadsheet, is valid. *Fforest,i* Data indicated in the fNRB Uganda for this parameter was checked against the methodological tool (TOOL30) data source seleted for correctness and accurate calculations in the fNRB sprreadhseet. Assessment team confirmed that the values of the parameter in the selected source: Global Forest Resources Assessment by the Food and Agriculture Organization of the United Nations (FAO), is correctly indicated in the fNRB Uganda spreadsheet as 2,337,902 ha and is thus valid. *Fother,i* Data indicated in the fNRB Uganda for this parameter was checked against the methodological tool (TOOL30) data source seleted for correctness and accurate calculations in the fNRB sprreadhseet. Assessment team confirmed that the values of the parameter in the selected source: Global Forest Resources Assessment by the Food and Agriculture Organization of the United Nations (FAO), is correctly indicated in the fNRB Uganda spreadsheet as 3,234,320 ha and is thus valid. *Pforest,i* Assessment team checked the fNRB Uganda spreadsheet to review the selected data source against the methodological tool (TOOL30) for credibility. Assessment team further checked data and information in the source for correctness and accuracte application of values for this parameter in the fNRB Uganda for this parameter. Assessment team confirmed that the data source "Proposed Forest Reference Emission Level for Uganda" 2018 is valid as it is a document of the Republic of Uganda (Ministry of Water and Environment) with most recent available national national data. Assessment team further confirmed that data used in the calculation of the parameter indicated in the fNRB Uganda spreadsheet is correct and

				calculations perfomed to obtain the value of the parameter, are accurate. Thus the parameter value applied as 1,117,300 ha is valid. *Pother,i* Assessment team checked the fNRB Uganda spreadsheet to review the selected data source against the methodological tool (TOOL30) for credibility. Assessment team further checked data and information in the source for correctness and accuracte application of values for this parameter in the fNRB Uganda for this parameter. Assessment team confirmed that the data source "Proposed Forest Reference Emission Level for Uganda" 2018 is valid as it is a document of the Republic of Uganda (Ministry of Water and Environment) with most recent available national national data. Assessment team further confirmed that data used in the calculation of the parameter indicated in the fNRB Uganda spreadsheet is correct and calculations perfomed to obtain the value of the parameter, are accurate. Thus the parameter value applied as 2,302,800 ha is valid. *HW* The Uganda Wood Asset and Forest Resources Accounts Report 2020 was reviewed against CDM TOOL 30 requirements for credibility and QA/QC procedures applicable for this parameter. The fNRB Uganda spreadsheet was checked against the Uganda Wood Asset and Forest Resources Accounts Report for correctness and consistent application of values. Assessmet team confirmed that the source: The Uganda Wood Asset and Forest Resources Accounts Report 2020 is credible as it is an official report recognized nationally by the Repulic of Uganda and internationally by UN and Worldbank, with most recent data (after 2000 data). Hence, the data provided is valid and of desired level of quality. It was confirmed that the value 27,024,000 tonnes/yr indicated in the fNRB Uganda calculation spreadsheet, is correct and has been correctly applied in line the methodological tool requirements. *CE* The Uganda Wood Asset and Forest Resources Accounts Report 2020 was reviewed against CDM TOOL 30 requirements for credibility and QA/QC procedures applicable for this parameter. The fNRB Uganda spreadsheet was checked against the Uganda Wood Asset and Forest Resources Accounts Report for correctness and consistent application of values. Assessmet team confirmed that the source: The Uganda Wood Asset and Forest Resources Accounts Report 2020 is credible as it is an official report recognized nationally by the Repulic of Uganda and internationally by UN and Worldbank, with most recent historical available data (2020 data).

			Hence, the data provided is valid and of desired level of quality. It was confirmed that the value 3,656,000 tonnes/yr indicated in the fNRB Uganda calculation spreadsheet is correct, no double counting was detected and the value is correctly applied in line the methodological tool requirements. *NE* The Uganda Wood Asset and Forest Resources Accounts Report 2020 was reviewed against CDM TOOL 30 requirements for credibility and QA/QC procedures applicable for this parameter. The fNRB Uganda spreadsheet was checked against the Uganda Wood Asset and Forest Resources Accounts Report for correctness and consistent application of values. Assessmet team confirmed that the source: The Uganda Wood Asset and Forest Resources Accounts Report 2020 is credible as it is an official report recognized nationally by the Repulic of Uganda and internationally by UN and Worldbank, with most recent historical available data (2020 data). Hence, the data provided is valid and of desired level of quality. It was confirmed that the value 18,636,000 tonnes/yr indicated in the fNRB Uganda calculation spreadsheet is correct, no double counting was detected and the value is correctly applied in line the methodological tool requirements. *N* The fNRB Uganda spreadsheet was checked and confirmed that the value applied as 1 is valid as the number of households is alredy included in the value of the *HW*. **Purpose of the parameter:** Calculation of baseline and project emissions. **Supporting Document:** fNRB Uganda spreadsheet named '01MAR24 fNRB Uganda'. **Conclusion:** The parameter has been correctly and accurately determined in line with all methodological and methodological tool requirements.

Therefore, the baseline emission quantification follows AWMS method 1 - IPCC Tier 1 approach, since the voluntary project activity involves the installation of domestic biogas digesters at individual households (small farms), as defined by Section 2.2.3 of the methodology.

The biogas is utilized for household thermal applicaitions (mainly cooking), and the bioslurry is handled anaerobicall through direct application to the fields, and not confimed to encourage futher anaerobic degradation.

The following sources of information have been used in this context:

- /VPA-DD/
- /PoA-DD/
- /Meth/
- /BS/
- /VVS/
- /CSA/

	• /WR/ • /TECH/ • /fNRB/	
Findings	☐	The calculation of the emission reductions was found to be fully compliant with the above stated principles. The calculations of baseline, project GHG emissions and leakage or net GHG removals have been carried out in accordance with the formulae and methods described in the PoA-DD, the applied methodology and, where applicable, the applied standardized baseline. Any assumptions used in emission or removal calculations have been justified. Appropriate emission factors, IPCC default values, GWPs and other reference values have been correctly applied. No errors, miscalculations, omissions, misstatements or incomplete information has been identified.
	☒	The respective requirements have widely been complied with. However in this context the following CARs, CLs, FARs have been raised:
		CAR 03
Conclusion	☐	No CARs/CLs have been raised in this context. No correction was required in the context. The project is in line with the respective requirements.
	☒	The raised CARs/CLs have been addressed appropriately. The PP has carried out the requested corrections. All respective findings could be closed out. For details please refer to Appendix 4.
	After appropriate corrections, it is confirmed that the emission reduction calculation is overall correct.	

D.5. Demonstration of eligibility of the VPAs

Means of validation

A complete list of eligibility criteria has been prescribed in the PoA-DD and the generic VPA-DD.

The compliance and fulfilment on the established VPA inclusion criteria has been sufficiently justified in section F of the VPA-DD. The VVB confirms that all eligibility criteria are sufficiently fulfilled with appropriate evidences. Detailed assessment can be found in Appendix 8 of this report.

No.	Eligibility criterion – Category	Eligibility criterion Required condition	Supporting evidence for inclusion	VVB assessment
1.	The geographical boundary of the VPA including any time-induced boundary consistent with the geographical boundary set in the PoA	All biogas systems included in the VPA will demonstrate they fall within the geographical boundary of the PoA through: – Recording the address/location of the system in Salesforce or equivalent software – Warranty or household sales agreement	Project database with address and location is provided. Contractual agreement between CME and VPA implementer is provided (confidential document) Warranty or household sales contract of the first digester with plant code BSU/46 is provided	The Validation team confirms that the geographical boundary of the VPA is consistent with the boundary set in the PoA. The VT also confirms that all the paerticipants intervieweds are within the boundary .A sample warranty of digester with plant code BSU/46
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	Double counting is avoided by unique biodigester identification and as per methodology procedure indicator BGTA 1 and 2	Project database with unique codes is provided. Other responses are captured in	Validation team confirms that this eligibility criterion has been sufficiently set.There are unique

				parameter BGTA 1 and 2 in Section B6.2	identification of plants and the end user locations provided in the spreadsheets.
	3.	Conditions to confirm that VPAs are neither registered as project activities with other offset Schemes, included in other registered PoAs, nor the project activities that have been deregistered;	The required condition is that the biodigester is only registered under this project	– captured in parameter BGTA 2 in Section B6.2	The VPA is under the PoA GS2747 only and VPA GS4236. The digesters within each VPA can be uniquely identified
	4.	Specification of the technology/measure such as the level and type of service, as well as performance specification based on, inter alia, testing/certification;	Demonstration that the plant is installed according to specifications by conducting a commission check	Only plants that are commissioned are included, the evidence is the database containing the date of commissioning	The Validation team confirms that the PP has demonstrated that only commissioned plants are included in the project database
	5.	Conditions to check the start dates of VPA through documentary evidence	The start date is defined as the first digester commissioned in a VPA	Warranty certificate or sales contract of the first plant commissioned with code BSU/46 is provided	The Validation team assessed a sample warranty certificate of the first plant commissioned with the code BSU/046 and confirms that start date is 11/11/2009, which is the date that the first digester was commissioned
	6.	Conditions to ensure compliance with the applicability of the applied methodologies, the applied standardized baselines and the other applied methodological regulatory document	The VPA shall provide a discussion on the applicability of the applied methodology	Description as per VPA-DD section B.2	The validation team checked the selected methodology and confirms compliance of the VPA to its applicability
	7.	Conditions to ensure that VPA meet the requirements for demonstration of additionality	As per CDM Tool 21 Demonstration of additionality of small-scale project activities. Version 13.1	Additionality is demonstrated in VPA-DD section B.5	The Validation team confirms that the VPA conforms to theadditionality requirements of the applied methodology
	8.	Conditions to ensure no diversion of official development assistance;	VPAs will demonstrate that any Official Development Assistance received for the VPA has not occurred on the condition that the resulting credits are transferred to the donor country	A signed ODA no diversion letter is uploaded to the registry	There is no diversion letter uploaded to the registry. Therefore the validation team confirms compliance to this condition
	9.	Target group (e.g. domestic/commercial/industrial, rural/urban, gridconnected/offgrid)	The VPA will describe the target group	As per table 4 in this VPA-DD, the VPA disseminates a technology developed for small farmers with sufficient manure available for feeding. Farmers typically live in rural areas.	The Validation team checked the gographical locations provided by participants of BFT and baseline surveys. This was also confirmed during

				the virtual interviews and it is confirmed that the target group is small farmers living in rural areas with a number of animals to provide sufficient manure
10.	Conditions related to sampling requirements for the PoA	The conditions as stipulated in the applied methodologies	Section B7.2 of this VPA-DD contains the conditions related to sampling aligned with the applied methodologies	The validation teams confirms that the PP has complied to the general sampling survey procedures and technique
11.	Conditions to ensure that CPAs that will be included meet the small-scale thresholds and remain within those thresholds throughout the crediting period	The VPA Implementer will ensure that each VPA remains below the small-scale limits. For activities falling under Type I, each VPA in aggregate will remain below 15 MW ($45MW_{th}$) per year. For activities falling under Type III, each VPA will achieve below 60,000 tCO_2e in emission reductions annually.	See section A.4 in this VPA-DD for this demonstration	As per GS optional requirement 'GHG emissions reductions & sequestration product requirements' v2.1', the VPA falls under the small scale threshold as the emission reductions are below 60,000 tCO_2e annually.The VT confirmedthis by crosschecking the calculations in the spreadsheets provided by PP
12.	Conditions to confirm that technologies in V/CPAs are eligible	Demonstration that only biodigesters are included up to 100 m^3	The ER spreadsheet contains the project database with the size of each plant installed. None of the digesters included are over 100 m^3	The VT cross checked the plant sizes in the spreadsheet to confirm that all plants included were not above 100 m^3
13.	Conditions to be met by each VPA regarding SDG outcomes assessment	N/A. From 13 March 2022, the SDG Impact Tools are a mandatory part of the project development cycle. This tool has been adopted	SDG impact tool is used to identify SDGs as per GS requirements	The VT checked the SDGimpact tool spreadsheet provided by PP and confirms that the tool has been correctly adopted.

The following sources of information have been used in this context:

- /VPA-DD/
- /PoA-DD/
- /VVS/
- /Meth/

Findings	☒	The list of eligibility criteria is in accordance with the applicable VVS requirements.
	☐	A complete list of eligibility criteria has been set up in the PoA-DD and the generic VPA-DD. The respective requirements have widely been complied with in this VPA. However in this context the following CARs, CLs, FARs have been raised:
		-

Conclusion	☒	No CARs/CLs have been raised in this context. No correction was required in the context. The project is in line with the respective requirements.
	☐	The raised CARs/CLs have been addressed appropriately. The PE has carried out the requested corrections. All respective findings could be closed out. For details please refer to Appendix 4.
	All eligibility criteria as prescribed by the PoA have been fulfilled, justified, and evidenced.	

D.6. VPA Boundary

Means of validation

The project boundary is defined in the methodology Section 3.1.1 as the physical, geographical sites of:

a. The livestock;

b. Animal manure management systems;

c. Biogas utilization for thermal applications;

d. Digestate treatment, usage and/or disposal (where appliable).

The target area and fuel production and collection area and the the physical, geographical sites of the project technologies/practicesare also included in the project boundary: In line with the methodology, where the baseline fuel is woody biomass (including charcoal), the project boundary also includes the area within which this woody biomass is grown and collected. For other fuels such as fossil fuel e.g., Coal, LPG, Kerosene, the boundary can be ignored.

Emissions sources included in or excluded from the project boundary

Scenario	Source	Gas	Included	Explanation
Baseline Scenario	Animal Waste Management System	CO_2	No	CO_2 emissions from the decomposition of organic waste are not included.
		CH_4	Yes	Major source of emissions.
		N_2O	Yes	Direct and indirect N_2O emissions are accounted for projects applying Tier 2 approach. The baseline emission shall be estimated following the guidance from IPCC 2019, section 10.5, Tier 2 or Tier 3 approach for direct and indirect N2O emissions. This is excluded when Tier 1 is applied
	Delivery of thermal energy	CO_2	Yes	Important source of emissions.
		CH_4	Yes	Important source of emissions, unless justified negligible.
		N_2O	Yes	Can be significant for some fuels, unless justified negligible.
	Production of fuel, transport of fuel	CO_2	Yes	Included for digesters for which Tier 2 is applied Excluded when Tier 1 approach is applied
		CH_4	Yes	Included for digesters for which Tier 2 is applied Excluded when Tier 1 approach is applied
		N_2O	No	Excluded for simplification; conservative.
Project Scenario	Animal Waste Management System	CO_2	No	CO_2 emissions from the decomposition of organic waste are not included.
		CH_4	Yes	Emissions from physical leakage, as well as emissions from the animal waste not treated in the bio-digester.
		N_2O	No	Excluded as a biodigester does not produce N_2O gasses.
	Delivery of thermal energy	CO_2	Yes	Important source of emissions.
		CH_4	Yes	Important source of emissions.
		N_2O	Yes	Can be significant for some fuels.
	Production of fuel, transport of fuel	CO_2	Yes	Included for digesters for which Tier 2 is applied Excluded when Tier 1 approach is applied
		CH_4	Yes	Included for digesters for which Tier 2 is applied Excluded when Tier 1 approach is applied
		N_2O	No	Excluded for simplification.

	The following sources of information have been used in this context: • /VPA-DD/ • /PoA-DD/ • /Meth/	
Findings	☐	The calculation of the emission reductions was found to be fully compliant with the above stated principles. The calculations of baseline, project GHG emissions and leakage or net GHG removals have been carried out in accordance with the formulae and methods described in the PoA-DD, the applied methodology and, where applicable, the applied standardized baseline. Any assumptions used in emission or removal calculations have been justified. Appropriate emission factors, IPCC default values, GWPs and other reference values have been correctly applied. No errors, miscalculations, omissions, misstatements or incomplete information has been identified.
	☒	The respective requirements have widely been complied with. However in this context the following CARs, CLs, FARs have been raised:
		CAR 03
Conclusion	☐	No CARs/CLs have been raised in this context. No correction was required in the context. The project is in line with the respective requirements.
	☒	The raised CARs/CLs have been addressed appropriately. The PP has carried out the requested corrections. All respective findings could be closed out. For details please refer to Appendix 4.
	After the correction, the project boundary is set in line with the methodology	

D.7. Additionality

Means of validation	The additionality of the VPA is demonstrated per the conditions outlined in the registered GS PoA. Accordingly, the VPA has proved the additionality at initial validaiton as follows: a) Biogas system rated capacity is less than 2.25MW_{th} each b) Biogas systems are disseminated to households or communities or Small and Medium Enterprises (SMEs). The VVB at registration validated that no biogas systems larger than 150kW (450kW_{th}) are accepted under this SSC-VPA. Each subsystem has 37.36 kW thermal capacity according to the calculations of the Emissions Reductions Calculation spreadsheet. Therefore, all units qualify under the positive list. Further, as per GS template guide VPA design document and Section 4.1.51 of the GS4GG Principles and Requirements, ongoing financial need has to be demonstrated by projects that demonstrate financial additionality. This project did not demonstrate need to financial additionality during the initial project design validation/registration for the first crediting period. The following sources of information have been used in this context: • /VPA-DD/ • /PoA-DD/ • /CSA/ • /XLS/	
Findings	☐	The calculations of baseline, project GHG emissions and leakage or net GHG removals have been carried out in accordance with the formulae and methods described in the PoA-DD, the applied methodology and, where applicable, the applied standardized baseline. Any assumptions used in emission or removal calculations have been justified. Appropriate emission factors, IPCC default values, GWPs and other reference values have been correctly applied.
	☒	The respective requirements have widely been complied with. However in this context the following CARs, CLs, FARs have been raised:
		CAR 03

Conclusion	☐	No CARs/CLs have been raised in this context. No correction was required in the context. The project is in line with the respective requirements.
	☒	The raised CARs/CLs have been addressed appropriately. The PP has carried out the requested corrections. All respective findings could be closed out. For details please refer to Appendix 4.
	The validation team can confirm that upon revalidation, the VPA is still additional and complies with the PoA-DD additionality requirementss.	

D.8. Estimated emission reductions or net anthropogenic removals

Means of validation

The validation team has checked the ex-ante ER calculation in section B.6.1 of the VPA-DD as well as the XLS calculation sheet. In detail the following has been verified:

- *Transparency:* It has been checked whether the calculation of the ER calculation is fully traceable and, where used, the Excel calculation provides all calculation formulae.
- *Parameter consistency:* It has been checked whether all internal and external parameters and data used for the calculation are applied consistently in the VPA-DD and the calculation spreadsheet.
- *Correctness:* It has been checked whether the applied formulae and methods for calculating emission reductions are in accordance with the monitoring plan in the PoA-DD and the approved methodology.
- *Completeness:* It has been checked whether all calculations are complete and without omissions.

The VPA-DD applies steps and equations to calculate project emissions, baseline emissions, leakage and emission reductions as per the requirements of the applied methodology. By checking ex-ante calculations of the VPA-DD, the validation team assessed the data used in the determination of the baseline and the methodological choices in section B.6.1 of the VPA-DD.

The GHG emission reductions are calculated as the difference between the baseline emissions and the project emissions. This project includes two sources of emission reduction:

1. Avoidance of methane emissions from AWMS.
2. Displacement of non-renewable biomass and fossil fuels

The applied methodology offers two methods for baseline emission quantification from AWMS:

a) AWMS method 1 - IPCC Tier 1 approach,

b) AWMS method 2 - IPCC Tier 2 approach,

In this VPA IPCC Tier 1 approach is applied as the target is household farms.

(a) Baseline Emissions AWMS

AWMS method 1 requires livestock population data by animal species/category, climate region or temperature and data on baseline animal manure management practice in the project boundary.

Baseline emissions for the production system (low productivity systems) are determined as follows:

$$BE_{AWMS,y} = N_{b,p,y} \div 365 \times GWP_{CH4} \times UF_b \times U_{p,y} \times \sum_{j,LT} (N_{LT,y} \times VS_{LT,y} \times MS\%_{Bl,j} \times EF_{LT,y}) \div 1000$$

$BE_{AWMS,y}$ = Baseline emissions in year *y* (t CO_2e)

$N_{b,p,y}$	=	Number of project technology-days included in the project database for each project scenario in year y
GWP_{CH4}	=	Global Warming Potential (GWP) of CH_4 applicable to the crediting period
UF_b		Model correction factor to account for model uncertainties (0.89)
$U_{p,y}$	=	Usage rate for technologies in project scenario p in year y (fraction).
LT	=	Index for all types of livestock
j	=	Index for animal waste management system
$N_{LT,y}$	=	Annual average number of animals of type *LT* in year *y* (numbers)
$VS_{LT,y}$	=	Volatile solids production/excretion per animal of livestock *LT* in year *y* (on a dry matter weight basis, kg-dm/animal/year)
$MS\%_{Bl,j}$	=	Fraction of animal manure handled in baseline animal manure management system *j*. (%). The project developer may apply the default IPCC values or conduct surveys to assess the animal manure management practices in the baseline.
$EF_{LT,y}$	=	Emission factor for direct CH_4 emissions by livestock *LT*, in manure management system j.

Survey methods are used to determine $MS\%_{bl,j}$ and the annual average animal population ($N_{LT,y}$).

The annual average number of animals ($N_{LT,y}$) is determined as follows:

$$N_{LT,y} = N_{da,y} \times \left(\frac{N_{p,y}}{365}\right)$$

Where:

$N_{da,y}$	=	Number of days animal is alive in the farm in the ye
$N_{p,y}$	=	Number of animals produced annually of type *LT* fo

Volatile solids (*VS)* are the organic material in livestock manure and consist of both biodegradable and non-biodegradable fractions.

The parameter $VS_{LT,y}$ is calculated as below:

$$VS_{LT,y} = (VS_{rate,LT} \times \frac{TAM_{LT}}{1000}) \times nd_y$$

Where:

$VS_{LT,y}$	=	Annual volatile solid excretions for livestock *LT* entering all animal waste management systems on a dry matter weight basis (kg-dm/animal/yr)
$VS_{rate,LT}$	=	VS excretion rate (kg VS / (1000 kg animal mass) / day)
TAM_{LT}	=	Typical animal mass for livestock LT (kg/animal).
nd_y	=	Number of days that the animal manure management system was operational in year *y*

b. Thermal application method 1: Based on avoided quantity of fuel consumption

The baseline emission from thermal application in year y shall be calculated as outlined below. Each unit (e.g., cook stove, heater) have a rated capacity equal to or less than 150 kW thermal.

$$BE_{TA,y} = \sum_{b,p} (N_{b,p,y} \times U_{p,y} \times (f_{NRB,i,y} \times SE_{b,y,CO2} + SE_{b,y,no}$$

$BE_{TA,y}$	=	Baseline emissions for total project activity in year y (tCO_2e/yr)
$\sum_{b,p}$	=	Sum over all relevant baseline b/project p pairs

	$N_{b,p,y}$ = Number of project technology-days included in the project database for each project scenario in year y. The start date is the day a plant start producing biogas. A default of 2 weeks will be used for the period from installation date and start date. $U_{p,y}$ = Usage rate for technologies in project scenario p in year y (fraction) $SE_{b,y,CO2}$ = Specific CO_2 emissions for a baseline b technology in year y (tCO_2/technology*day) $SE_{b,y,non-CO}$ = Specific non-CO_2 emissions for a baseline b technology in year y (tCO_2e/technology*day) $f_{NRB,i,y}$ = Fraction of biomass used in year y for baseline scenario b that can be established as non-renewable biomass (fraction). The parameter $f_{NRB,b,y}$ is excluded from this equation when the observed baseline fuel is fossil fuel. Specific emission CO_2 & non-CO_2 are determined by using one of the following options below, for each baseline scenario b /project scenario p pair separately. $$SE_{b,y,Co2} = \sum_i P_{b,i,y} \times NCV_{b,i,fuel} \times EF_{b,i,CO2}$$ $$SE_{b,y,non-Co2} = \sum_i P_{b,i,y} \times NCV_{b,fuel} \times EF_{b,i,non-CO2}$$ Where: i = Index for the type of baseline/fossil fuel consumed $P_{b,i,y}$ = Average yearly consumption of baseline fuel *i* per household before the start of the project activity or at the renewal of each crediting period, whichever is later (tonnes/household/day) $NCV_{b,i}$ = Net calorific value of the fuel(s) *i* that is substituted in baseline b (TJ/tonne) $EF_{b,i,CO2}$ = CO_2 emission factor arising from use of fuels *i* in baseline scenario (tCO_2/TJ) $EF_{b,i,non-CO}$ = Non-CO_2 emission factor arising from use of fuels in baseline scenario (tCO_{2e}/TJ) *Pb,i,y* will be determined via KPT survey The fNRB is calculated as per CDM Tool 30 v4.0 **Project emissions** **A. Project emission from AWMS system** **AWMS method 1 (IPCC 2019 TIER 1 approach)** The project emissions involve emissions from the biodigester, which include: a. Physical leakage biogas b. Emissions from the use of fossil fuels or electricity for the operation $PE_{AWMS,y} = PE_{PL,y} + PE_{power,y}$ Where: $PE_{AWMS,y}$ = Project emissions in year y (t CO2e) $PE_{PL,y}$ = Emissions due to physical leakage of biogas in year y (t CO2e) $PE_{power,y}$ = Emissions from the use of fossil fuel or electricity for the operatic year *y* (t CO_2e)

The physical leakage from biodigesters is calculated as 10% of the maximum methane producing potential of the manure fed into the management systems implemented by the project activity, as per the following equation:

$$PE_{PL,y} = 0.10 \times N_{b,p,y} \div 365 \times U_{p,y} \times GWP_{CH4} \times D_{CH4} \times \sum_{k} \sum_{i,LT} B_{0,LT} \times N_{LT,y} \times VS_{LT,y} \times MS\%_{i,y}$$

Where:

$PE_{PL,y}$	=	Project emissions from physical leakage in year y (t CO2e)
GWP_{CH4}	=	Global Warming Potential (GWP) of CH4 applicable to the crediting period.
D_{CH4}	=	CH4 density (0.00067 t/m^3 at room temperature (20 ºC) and 1 atm pressure)
LT	=	Index for all types of livestock
i	=	Index for animal manure management system
k	=	Climate region k
$B_{0,LT}$	=	Maximum methane producing potential of the volatile solid generated for animal type LT.
$MS\%_{i,y}$	=	Fraction of manure handled in project animal manure management system i

B. Project emission from thermal application

Thermal application method 1: Based on avoided quantity of fuel consumption

The Project emission from thermal application in year y shall be calculated as follows:

$$PE_y = \sum_{b,p} (N_{b,p,y} \times U_{p,y} \times (f_{NRB,i,y} \times SE_{p,y,CO2} + SE_{p,y,non-CO2})$$

Where:

PE_y	=	Project emissions for total project activity in year y (tCO_2e/yr)
$\sum_{b,p}$	=	Sum over all relevant baseline b/project p pairs
$N_{b,p,y}$	=	Number of project technology-days included in the project database for each project scenario in year y
$U_{p,y}$	=	Usage rate for technologies in project scenario p in year y (fraction)
$SE_{p,y,CO2}$	=	Specific CO_2 emissions for a project p technology in year y (tCO_2/technology*day)
$SE_{p,y,non-CO}$	=	Specific non-CO_2 emissions for a project p technology in year y (tCO_2e/technology*day)
$f_{NRB,i,y}$	=	Fraction of biomass used in year y for project scenario p that can be established as non-renewable biomass (fraction). The parameter $f_{NRB,p,y}$ is excluded from this when the observed project additional fuel is fossil fuel.

Specific emission CO_2 & non-CO_2 are determined below, for each baseline b /project p pair separately.

$$SE_{p,y,Co2} = \sum_i P_{p,i,y} \times NCV_{p,i,fuel} \times EF_{p,i,fuel,CO2}$$

$$SE_{p,y,non-Co2} = \sum_i P_{p,i,y} \times NCV_{p,fuel} \times EF_{p,i,fuel,non-CO2}$$

Where:

i	=	Index for the type of project/fossil fuel consumed
$P_{p,i,y}$	=	Average daily consumption of project fuel i per household (tonnes/household/day)
$NCV_{p,i,fuel}$	=	Net calorific value of the fuel(s) i that is used in project p (TJ/tonne)
$EF_{p,i,fuel,CO2}$	=	CO_2 emission factor arising from use of fuels i in project scenario (tCO_2e/TJ)
$EF_{p,i,fuel,non-CO2}$	=	Non-CO_2 emission factor arising from use of fuels in baseline scenario (tCO_2e/TJ)

$P_{p,i,y}$ shall be determined via KPT survey.

Leakage Emissions:

a. Animal waste management system

AWMS method 1: The proper soil application (which not resulting in methane emissions) of the digestate shall be verified on a sampling basis. This will be part of the SMS and is captured in montoring parameters BGTA 32.

The verification will be part of the SDG monitoring survey (SMS).

In addition to this, households may use bio-slurry as animal feed, insecticide, sell it as fertilizer, etc. These options do not result in methane emissions as well.

b. Thermal application

Leakage emissions $LE_{p,y}$, shall be determined allowing one of two options below.

Option 1 - Apply a default adjustment factor of 0.95 to the emission reductions to approximate leakage emissions for thermal application.

Option 2 - The project developer must evaluate the following potential sources of leakage and provide an evidence-based description and preliminary quantification of each potential source and its relevance for the project:

a. The displaced baseline technologies are reused outside the project boundary in place of lower emitting technology or with a higher intensity than would have occurred in the absence of the project.

b. Members of the population who do not participate in the project, and previously used lower emitting energy sources, instead use the non-renewable biomass or fossil fuels saved under the project activity.

c. The project significantly reduces the NRB fraction within an area where other GHG mitigation project activities account for NRB fraction in their baseline scenario.

d. The project population compensates for loss of the space heating effect of inefficient technology by adopting some other form of space heating or by retaining some use of inefficient technology.

	e. By virtue of promotion and marketing of a new technology, the project stimulates substitution with this technology by households who commonly used a technology with relatively lower emissions. For each source for which the leakage assessment expects an increase in fuel consumption by non-project households/users attributable to the project activity, then calculations must be undertaken to account for the leakage from this source. Leakage is either calculated as a quantitative emissions volume (tCO_2e) or as a percentage of total emission reductions. The project documentation shall include a projection of leakage emissions based on available data and information. The monitoring plan must include monitoring parameters to be registered during the leakage investigation every two years to populate the leakage calculation. Option 1 and 2 is captured in BGTA 43. **Summary:** **Baseline Emissions (BEy):** = 59,452 tCO_2e **Project Emissions (PEy):** = 49,076 tCO_2e **Leakage emissions (LE_y):** = 0 tCO_2e Summary of ex-ante estimates of annual average emission reductions over the 7-year crediting period (CPII) $ER_y = BE_y – PE_y - LE_y$ = 59,452 - 49,076 - 0 = **10,376 tCO_2e** The following sources of information have been used in this context: • /VPA-DD/ • /PoA-DD/ • /Meth/ • /XLS/	
Findings	☐	The calculation of the emission reductions was found to be fully compliant with the above stated principles. The calculations of baseline, project GHG emissions and leakage or net GHG removals have been carried out in accordance with the formulae and methods described in the PoA-DD, the applied methodology and, where applicable, the applied standardized baseline. Any assumptions used in emission or removal calculations have been justified. Appropriate emission factors, IPCC default values, GWPs and other reference values have been correctly applied. No errors, miscalculations, omissions, misstatements or incomplete information has been identified.
	☒	The respective requirements have widely been complied with. However in this context the following CARs, CLs, FARs have been raised:
		CAR 03
Conclusion	☐	No CARs/CLs have been raised in this context. No correction was required in the context. The project is in line with the respective requirements.

	☒	The raised CARs/CLs have been addressed appropriately. The PP has carried out the requested corrections. All respective findings could be closed out. For details please refer to Appendix 4.
	After appropriate corrections, it is confirmed that the emission reduction calculation is overall correct.	

D.9. Validity of monitoring plan

Means of validation

The validation team has checked the VPA-DD, PoA-DD and the applied methodology.

For this VPA, the monitoring plan shall be consistent with the provisions of the generic VPA-DD monitoring plan. Two monitored parameters are included.

Parameter	Value	Unit	Justification
BGTA 24: Avoidance of double counting or double claiming among project technology end users	-	-	**Measurement Method:** The avoidance of double counting is to be ensured via unique identification of the biodigesters and end-users and inspecation of warranty cards **Monitoring Frequency:** whenever project technology is sold or otherwise disseminated **Purpose:** calculation of project scenario **QA/QC Procedures:** unique identification of users **Conclusion:** The monitoring plan is in line with the methodology
BGTA 25: $U_{p,y}$	63.2	%	**Measurement Method:** Monitoring of operationality of the biogas systems, including the operationality of both the biogas digester and biogas cookstove **Monitoring Frequency:Annual** **Purpose:calculation of project scenario** **QA/QC Procedures:** Compliance with the general requirements for sampling: Standard for sampling and surveys for CDM project activities and programme of activities." **Conclusion:** The VT cross checked the applied methodology and confirms that the monitoring plan complies with the methodology.
BGTA 26: $NLT_{,y}$	Dairy cows-6.72 Other cattle-3.07 Swine finishing-1.32 Breeding swine-1.70 Sheep-0.28 Goat-.96 Poultry-37.15	**Number**	**Measurement Method:** The annual average is determined by: - for animals with generally a static population: Asking the farmer how many on average he owns during a particular MP- -For animals raised in cycles like fattening will be asked how many rounds per year, the average length of a round and number of animal per round to calculate the annual average **Monitoring Frequency:** Annual **Purpose:** calculation of baseline and project scenario **QA/QC Procedures:** Compliance with the general requirements for sampling.

				Conclusion: The monitoring plan is in line with the methodology.
	BGTA 27: TAM_{LT}	Dairy cow-270 Cattle-270 Fattening pig-49 Breeding pig-41 Goat-31 Sheep - 24 Poultry-13	**Kg/animal**	**Measurement Method:** IPCC adjusted to animal weight **Monitoring Frequency:** annual **Purpose:** calculation of project scenario **QA/QC Procedures:** Proper implementation of the methodology **Conclusion:** Values are correctly applied.
	BGTA 28: nd_y	Varies with the length of MP	**days**	**Measurement Method:** Survey methods **Monitoring Frequency:** Annual **Purpose:** calculation of project scenario **QA/QC Procedures:** Compliance with general requirements for sampling **Conclusion:** The PP proposed sampling plan is in line with the methodology and the CDM Sampling Standard v9.0.
	BGTA 29: $Nda_{,y}$	Fattening pigs-118	**days**	**Measurement Method:** Monitoring survey **Monitoring Frequency:** Annual **Purpose:** Calculation of project scenario **QA/QC Procedures:** Compliance with the general requirements of sampling **Conclusion:** The monitoring plan complies with the methodology
	BGTA 30: $N_{p,y}$	Dairy cows-6.72 Other attle-3.07 Swine finishing-1.32 Breeding swine-1.70 Sheep-0.28 Goat-.96 Poultry-37.15	**-**	**Measurement Method:** in person interview **Monitoring Frequency:** annual **Purpose:** calculation of project scenario **QA/QC Procedures:** Compliance with the general requirements for sampling **Conclusion:** The monitoring plan complies with the methodological requirements.
	BGTA 31: $MS\%_{i,y}$		**%**	**Measurement Method:** Calculated based on the share fed into the digester **Monitoring Frequency:** Annual **Purpose:** Calculation of project scenario

				QA/QC Procedures:- Compliance with the general requirements for sampling **Conclusion:** The monitoring plan complies with the methodology
	BGTA 32: Proper soil application	0	-	**Measurement Method:** The use of bio-slurry will be monitored and in case bio-slurry is not used, it will be assessed if this leads to methane emissions **Monitoring Frequency:** Annual or biennial **Purpose:** Calculation of baseline scenario **QA/QC Procedures:** Compliance with the general requirements for sampling **Conclusion:** The monitoring plan complies with the methodology
	BGTA 38: $N_{b,p,y}$	Varies with length of MP	days	**Measurement Method:** Calculated from the Project database as the sum of the number of installed project technology units times the calendar days during the year y that they were used at the end user locations. The methodological default of 2 weeks is used for the period from commissioning and start date **Monitoring Frequency:** Annual **Purpose:** Calculation of project outcome **QA/QC Procedures:** Cross check the results of the usage survey with the contents of the project database to confirm whether the project technology units surveyed are present at end user locations as expected, or not **Conclusion:** The monitoring plan complies with the methodology
	BGTA 39: $LE_{p,y}$	0	tCO_2e per year	**Measurement Method:** monitoring survey **Monitoring Frequency:** Every two years, or default discount value of 0.95 applied to emission reductions **Purpose: calculation of project outcome** **QA/QC Procedures:**Compliance with the general requirements for sampling **Conclusion:** The monitoring plan complies with the methodology
	BGTA 42: $P_{p,i,y}$	Fire Wood-2.476 Charcoal-0.041	tonnes / house-hold / year	**Measurement Method:** KPT protocol **Monitoring Frequency:** Updated every two years, or more frequently. **Purpose:** calculation of project outcome

				QA/QC Procedures: Compliance with the general requirements for sampling **Conclusion:** The monitoring plan is in line with the methodology
	BGTA 43: Leakage assessment	0	tonnes / house-hold / year	**Measurement Method:** VT checked approved VPA03 CPI MRV and confirms the value is correct and valid. **Monitoring Frequency:** Updated every two years, or more frequently **Purpose:** calculation of project outcome **QA/QC Procedures:** Compliance with the general requirements for sampling **Conclusion:** The monitoring plan is in line with the methodology
	GSDM-I1.1.1: SDG1	1909	**UGX/ day**	**Measurement Method:** Monitoring survey **Monitoring Frequency:** Annual **Purpose:** calculation of project outcome **QA/QC Procedures:** Compliance with the general requirements for sampling **Conclusion:** The monitoring plan is in line with the methodology
	GSDM-I1.1.1: Forex	0.00025	**UGX/ USD**	**Measurement Method:** The website Xe.com will be used for the exchange rate **Monitoring Frequency:** Annual **Purpose:** Calculation of project outcome **QA/QC Procedures:** Inclusion of day of exchange rate for traceability **Conclusion:** The VT confirms that the PP included date of exchange as 8/8/2023 and applied the correct value as at the said date of exchange.
	GSDM-I2.2.3: BIOu	98	%	**Measurement Method:** Survey method – households will be asked how much land is in cultivation and the proportion on which bio-slurry is applied as main fertilizer **Monitoring Frequency:** Annual **Purpose:** calculation of project scenario **QA/QC Procedures:** Compliance with the general requirements for sampling

				Conclusion: The monitoring plan is in line with the methodology
	GSDM-I2.2.3: Fa	3.3	**Hectare/ hh**	**Measurement Method:** Survey method – households will be asked how much land is in cultivation and the proportion on which bio-slurry is applied as main fertilizer **Monitoring Frequency:** Annual **Purpose:** calculation of project scenario **QA/QC Procedures:** Compliance with the general requirements for sampling **Conclusion:** The monitoring plan is in line with the methodology
	GSDM-I3.3.9: HAP_r	83	**%**	**Measurement Method:** Survey method, households will be asked if a reduction in household air pollution is observed **Monitoring Frequency:** Annual **Purpose:** calculation of project scenario **QA/QC Procedures:** Compliance with the general requirements for sampling **Conclusion:** The monitoring plan is in line with the methodology
	GSDM-I4.4.1: Quality education	228	**number**	**Measurement Method:** Training reports **Monitoring Frequency:** Annual **Purpose:** Calculation of project scenario **QA/QC Procedures:** Recording of training and participant list **Conclusion:** The monitoring plan is in line with the methodology
	GSDM-I5.4.1: Ts	1.48	**Hours per day**	**Measurement Method:** Sample surveys in representative households. The main cook will be asked how much time she saved on collecting wood, starting and tendering the fire and cleaning of pots attributed to the biodigester. **Monitoring Frequency:** Annual **Purpose:** calculation of project scenario **QA/QC Procedures:** Compliance with the general requirements for sampling **Conclusion:** The monitoring plan is in line with the methodology
	GSDM-I5.4.1: Usage of time saved	Productive time use: 67%	**Usage of time saved**	**Measurement Method:** Sample surveys in representative households **Monitoring Frequency:** Annual

		Leisure: 25% Family activities: 25% education activities: 0% Social activities: 38%		**Purpose:** Calculation of baseline scenario **QA/QC Procedures:** Compliance with the general requirements for sampling **Conclusion:** The monitoring plan is in line with the methodology
	GSDM-I7.1.1: HHs	7.121	**HH size**	**Measurement Method:** Sample surveys in representative households **Monitoring Frequency:** Annual **Purpose:** calculation of project scenario **QA/QC Procedures:** Compliance with the general requirements for sampling **Conclusion:** The monitoring plan is in line with the methodology
	GSDM-I.12.5.2: $F_{(p,b)}$	78.3	**Kg feeding/ day**	**Measurement Method:** Sample surveys in representative households **Monitoring Frequency:** Annual **Purpose:** Calculation of project scenario **QA/QC Procedures:** Compliance with the general requirements for sampling **Conclusion:** The monitoring plan is in line with the methodology

Operational and Management Structure

The VPA-DD monitoring plan includes the Operational and Management Structure. Roles and responsibilities between MPCL and the CME have been outlined such that data recording, reporting, archiving and QA/QC procedures are clearly defined.

- /VPA-DD/
- /Meth/
- /IM01/
- /PS/

Findings	☒	The monitoring plan for the VPA is in accordance with the applicable VVS requirements, the PoA standard.
	☐	This sampling plan has been provided to the DOE for validation as a separate document. For further details on the proposed sampling plan please refer to the PoA Validation Report.
	☒	In this context the following CARs, CLs, FARs have been raised: CAR 03
Conclusion	☐	No CARs/CLs have been raised in this context. No correction was required in the context. The project is in line with the respective requirements.
	☒	The raised CARs/CLs have been addressed appropriately. The PP has carried out the requested corrections. All respective findings could be closed out. For details please refer to Appendix 4.

	The Validation team has validated all parameters in the monitoring plan against the requirements of the methodology. All the procedures for all monitoring parameters have been properly reviewed by the assessment team. This information, together with interviews conducted during the remote site visit, has allowed the validation team to confirm that the proposed monitoring plan is feasible, and in accordance with the project design and the applied methodology. The following are the parameters to be monitored.

D.10. Crediting period

Means of validation	The start date of the second VPA is 19/04/2022, which is the date immediately after the end of the last crediting period. Therefore, the second (2) crediting period shall be 19/04/2022 to 18/04/2029. The operational lifetime of the Deenbandhu model biodigester is at least 20 years. Therefore, the crediting period is feasible The chosen crediting period is 7 years renewable, which is in line with the PoA-DD and VPA-DD. The following sources of information have been used in this context: • /VPA-DD/ • /SD/ • /IM01/ • /TECH/
Findings	-
Conclusion	- The type and duration of the crediting period also indicated as 7years renewable per the original validation. - The crediting period is within the technical lifetime of the project equipment

D.11. Sustanable Development Goals

SDG Goal	Assessment of Methodological choices/approaches for estimating the SDG outcome
SDG 01 – No Poverty: **Relevant SDG Target:** 1.1 By 2030, eradicate extreme poverty for all people everywhere, currently measured as people living on less than $1.25 a day	**Measurement Method:** The VT confirmed that average household savings in expenditure on basic services such as cooking are monitored by asking the household how much money ios saved on cooking fuel expenditure since they started using biogas. The savings are then annualized and reported as USD/yearand in local currency per year. GSDM-I.1.1.1 = SDG_1 x Forex x $N_{b,p,y}$ Where: GSDM-I.1.1.1: Financial savings (UGX or USD saved in the MP) SDG_1: Gross savings (local currency/day) OM: Maintenance cost (UGX/day) Forex: Foreign exchange rate at time of MR writing (for expression in USD only) $N_{b,p,y}$: Technology days included **QA/QC Process:** Sampling guidelines and data analysis will be followed. I**ndicator:**

	Average household savings in expenditure on basic services such as cooking
SDG 02 – Zero Hunger: **Relevant SDG Target:** 2.4 By 2030, ensure sustainable food production systems and implement resilient agricultural practices that increase productivity and production, that help maintain ecosystems, that strengthen capacity for adaptation to climate change, extreme weather, drought, flooding and other disasters and that progressively improve land and soil quality	**Measurement Method:** The number of farmers using bioslurry is monitored by including question on bio slurry usage in the SDG monitoring survey (SMS). The total contribution is then calculated by multiplying this with the number of biodigesters in use. **GSDM-I2.4.2 Number of farmers adopted the practice by the project** GSDM-I.1.2.4.2 = $U_{p,y}$ x N_d x BIO_u Where: GSDM-I.1.2.4.2: Number of farmers using bio-slurry $U_{p,y}$: Usage rate for technologies in project scenario p in year y (fraction) N_d: Number of biodigesters constructed BIO_u: Bio-slurry usage rate (% farmers using bio-slurry) **GSDM-I2.4.3: Area under sustainable agriculture** Calculated by multiplying the outcome of GSDM-I.2.4.2 with the land area (Ha) on which bio-slurry is applied. The land area will be obtained by asking the farmer interviewed for the SMS how much land is owned and the share on which bio-slurry is applied. **QA/QC Process:** Not applicable **Indicator:** **1)** Number of farmers adopted the practice by the project 2) Area under sustainable agriculture
SDG 03 – Good Health and Wellbeing: **Relevant SDG Target:** 3.9 By 2030, substantially reduce the number of deaths and illnesses from hazardous chemicals and air, water and soil pollution and contamination	**Measurement Method:** Monitored by monitoring the percentage families mentioning a reduction in household air pollution. $$GSDM - I3.9.3 = U_{p,y} \times N_d \times HHs \times HAPr$$ Where: GSDM-I.3.9.3: Number of households reporting a decrease in PM2.5 and CO $U_{p,y}$: Usage rate for technologies in project scenario p in year y (fraction) N_d: Number of biodigesters constructed HH_s: Average household Size HAP_r: % of families mentioning reduction in household air pollution **QA/QC Process:** Sampling and data analysis $GSDM - I3.9.3 = U_{p,y} \times N_d \times HHs \times HAPr$**Indicator:**. Number of households that observed reduction in PM2.5 & carbon monoxide (CO) concentration reductions
SDG 04 – Quality of Education: **Relevant SDG Target:**	**Measurement Method:**

4.4 By 2030, substantially increase the number of youth and adults who have relevant skills, including technical and vocational skills, for employment, decent jobs and entrepreneurship	The VT confirmed that number of trainings provided will be determined by summing the number of masons trained during the monitoring period on biogas construction, refresher training and other biogas related trainings **QA/QC Process:** Cross checking the record of the number of people trained **Indicator:** Number of employees provided skill development training
SDG 05 – Gender Equality: **Relevant SDG Target:** 5.4 Recognize and value unpaid care and domestic work through the provision of public services, infrastructure and social protection policies and the promotion of shared responsibility within the household and the family as nationally appropriate	**Measurement Method:** The contribution will be reported as: (1) hours/year saved on fuel wood collection and cooking time (including cleaning) attributed to the installation of a biodigester and (2) usage of saved time. The female member of the household in charge of cooking and/or cooking fuel collection, will be asked:*How much time did you save on cooking and other cooking activities due to cooking on biogas and what she did with the saved time, or if no time savings were reported, the reason why there was no time saved* **QA/QC Process:** . Time savings will be calculated with this equation: GSDM-I.5.4.1 = Ts x $N_{b,p,y}$ x $U_{p,y}$ **Where:** GSDM-I.5.4.1: Hours' time saved in the MP Ts: Time savings (hours per day) $N_{b,p,y}$: Technology days included in the MP $U_{p,y}$: Usage rate for technologies in project scenario p in year y (fraction) $GSDM - I5.4.1 = \ Ts \ \times N_{b,p,y}$**Indicator**:. Average time saving associated with cooking time and fuel collection
SDG 07 – Affordable and clean energy: **Relevant SDG Target:** 7.1 By 2030, ensure universal access to affordable, reliable and modern energy services	**Measurement Method:** Increased access to clean energy will be calculated with this equation: $$GSDM - I7..1.1 = \ U_{p,y} \times N_{bd} \ \times \ HH_s \ \div 365$$ Where $GSDM - I7.1.1$ Contribution to SDG 7 in number beneficiaries with increased access to energy $U_{p,y}$ Usage rate for technologies in project scenario p in year y (fraction) N_d Number of biodigesters constructed HHs Household size **QA/QC Process:** Not applicable **Indicator:** Number of beneficiaries: Individuals and households
SDG 08 – Decent work and economic growth**:** **Relevant SDG Target:** 8.5 By 2030, achieve full and productive employment and decent work for all	**Measurement Method:** Defined as the total number of masons provided biodigester jobs. This data will be collected from the project database and constitutes a simple count of the individual masons provided employment. **QA/QC Process:**

women and men, including for young people and persons with disabilities, and equal pay for work of equal value	Cross checking the employee records for consistency with the database. **Indicator:** total number of jobs
SDG 09 – Industry, innovation and infrastructure: **Relevant SDG Target:** 9.3 Increase the access of small-scale industrial and other enterprises, in particular in developing countries, to financial services, including affordable credit, and their integration into value chains and markets	**Measurement Method:** The total number of companies supported are defined as the total number of biodigester construction enterprises (BCE) involved in biodigester construction **QA/QC Process:** This data will be collected from the project database and constitutes a simple count of individual BCE. On top of that, other companies active in the biodigester value chain, can be included, i.e. stove importers or assemblers. **Indicator:** Total number of companies supported for their integration into value chains and markets
SDG 12 – Responsible Consumption & Production: **Relevant SDG Target:** 12.5 By 2030, substantially reduce waste generation through prevention, reduction, recycling and reuse	**Measurement Method:** Determined through surveys. This is the total amount of bio-slurry produced by multiplying feeding (kg manure/day) with the total number of digesters in operation with the following equation. GSDM-I.12.5.2 = $F_{b,p}$ x $N_{b,p,y}$ x $U_{p,y}$ ÷ 1000 GSDM-I.12.5.2: Contribution to GSDM-I.12.5.2 in ton bio-slurry $F_{b,p}$: Biodigester feeding rate (kg manure/day) $N_{b,p,y}$: Number of technology days in included $U_{p,y}$: Usage rate for technologies in project scenario p in year y (fraction) **QA/QC Process:** This parameter is calculated based on surveys, and no QA/QC procedure required. **Corresponding indicator:** Bio-slurry produced and used for sustainable agriculture
SDG 13 – Climate Action: **Relevant SDG Target:** 13.2 Integrate climate change measures into national policies, strategies and planning	**Measurement Method:** Calculated and assessed in Section D.8 of this document. **QA/QC Process:** N/A **Corresponding indicator:** Amount of GHGs emissions avoided or sequestered
SDG 15 – Life on Land: **Relevant SDG Target:** 15.1 By 2020, ensure the conservation, restoration and sustainable use of terrestrial and inland freshwater ecosystems and their services, in particular forests, wetlands, mountains and drylands, in line with obligations under international agreements	**Measurement Method:** This value is calculated as the difference between baseline fuelwood consumption and project scenario consumption after implementation of the proposed project activity. $GSDM - 1\ 15.1.1 = N_{b,p,y} \times U_{p,y}(P_{b,wood,y} + P_{b,charcoal,y} \times C_C) - (P_{p,wood,y} + P_{p,charcoal,y} \times C_C))$ Where: GSDM-I.15.1.1: Contribution to SDG 15 in tonne/year $N_{b,p,y}$: Number of technology days in included $U_{p,y}$: Usage rate for technologies in project scenario p in year y (fraction)

	$P_{b,wood,y}$: Average daily consumption of wood in the baseline scenario per household obtained from the BFT (tonnes/household/day) $P_{b,charcoal,y}$: Average daily consumption of charcoal in the baseline scenario per household obtained from the BFT (tonnes/household/day) $P_{p,wood,y}$: Average daily consumption of wood in the project scenario per household obtained from the PFT (tonnes/household/day) $P_{p,charcoal,y}$: Average daily consumption of charcoal in the project scenario per household obtained from the PFT (tonnes/household/day) C_c: Wood to charcoal conversion factor **QA/QC Process:** N/A **Corresponding indicator:** Total amount non-renewable wood fuel saved
Conclusion	All SDGs in the Transition Annex are included for the second crediting period. Additional SDGs for the second crediting period (CPII) are: SDG 4, SDG 9, SDG 12 & SDG 15.

D.12. Safeguarding Principle & Gender Sensitivity

Means of validation	According to Appendix 1 of the revised VPA-DD, no safeguarding principle is relevant and requires a mitigation measure. The same is consistent with the approved Transition Annex (TA). Therefore, no safeguarding peinciple is added into the proposed monitoring plan. The validation team can confirm that the ongoing voluntary project activity is not at risk of violating an of the GS4GG safeguarding principles. The CME has further assessment whether the ongoing voluntary project activity complies with GS4GG Gender Sensitive requirements. Section D.2 of the updated VPA-DD has demonstrated how the prpject address gender sensitive issues in line with the GS4GG. All the four questions in the VPA-DD template version 2.3 have been duly answered to the satisfaction of the validation team. The following sources of information have been used in this context: • /VPA-DD/ • /PoA-DD/ • /IM01/ • /TECH/
Findings	-
Conclusion	The project complies with the GS4GG safeguarding perinciples and gender sensitive requirements.

D.13. CME and project participants

Means of validation	The validation team has checked the updated VPA-DD and the SustainCERT website/gs/. The CME is Africa Bioenergy Program Limited (ABPL) and the local VPA implementing partner is Biogas Solutions Uganda Ltd (BSUL). The information is consistent with Section A.6 of the validated and registered VPA-DD, and hence, no further analysis is required. The validation team has also checked the management agreement/CER/ between the CME and the indicated VPA implementer in the VPA-DD. The following sources of information have been used in this context: /VPA-DD/ /PoA-DD/ /gs/ /CER/

Findings	☒	The names of the project participants as listed in the revised VPA-DD (sections A.1. and appendix 2) are consistent.
	☐	The respective requirements have widely been complied with; however; the following issues needed to be addressed in this context:
		- N/A
Conclusion	☒	No CARs/CLs have been raised in this context. No correction was required in the context. The project is in line with the respective requirements.
	☐	The raised CARs/CLs have been addressed appropriately. The PP has carried out the requested corrections. All respective findings could be closed out. For details please refer to Appendix 4.
	The names of the CME and the VPA Implementer are consistent with those listed on the original VPA-DD, and the title page and Section A.1 and Appendix 2 of the updated VPA-DD for the second crediting period.	

D.14. Post-registration changes

Type of post-registration changes (PRCs)	Confirmation (Y/N)	Validation report for PRCs	
		Version	Completion date
Temporary deviations from the registered monitoring plan, applied methodologies, standardized baselines or other methodological regulatory documents[2]	N	-	-
Corrections	N	-	-
Changes to the start date of the crediting period of component project activity	N	-	-
Inclusion of monitoring plan	N	-	-
Permanent changes to the registered monitoring plan, or permanent deviation of monitoring from applied methodologies, standardized baselines, or other methodological regulatory documents	N	-	-
Changes to the project design	Y	9.2	14/09/2023
Changes specific to afforestation and reforestation activities	N	-	-
Others (please specify)	N	-	-

SECTION E. Internal quality control

Before the submission of the final validation report a technical review of the whole validation procedure was carried out. The technical reviewers are competent GHG auditors where at least one is being appointed for the scope this VPA falls under. The technical reviewers are not considered to be part of the verification team and thus not involved in the decision making process up to the technical review.

As a result of the technical review process the validation opinion and the topic specific assessments as prepared by the validation team leader may have been confirmed or revised. Furthermore reporting improvements might have been achieved.

After the successful technical review, an overall (esp. procedural) assessment of the complete validation has been carried out by a senior assessor located in the accredited premises of TÜV NORD CERT GmbH.

After this step the submission for requesting for registration is conducted.

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

SECTION F. Validation opinion

The Africa Bioenergy Programs Limited (ABPL) has commissioned the TÜV NORD JI/CDM Certification Program to carry out the Gold Standard Design Certification Renewal (DCR) for the GS VPA “African Biogas Carbon Programme (ABC) – Uganda - VPA003” (GS ID 4236) with regard to the relevant requirements of the Gold Standard project activities, as well as criteria for consistent project operations, monitoring and reporting. The Gold Standard documentation and supporting documents were reviewed against the criteria as set out in the Gold Standard GS4GG requirements.

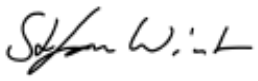
The Gold Standard documentation and supporting documents were reviewed against the criteria as set out in the GS4GG, respective Annexes and CDM requirements, as applicable. The subsequent background investigation, follow-up interviews and review of comments by parties, stakeholders and NGOs have provided TÜV NORD JI/CDM Certification Program with sufficient evidence to validate the fulfilment of the stated criteria applicable for validation.

In detail the conclusions can be summarized as follows:

- The project meets all eligibility criteria set by the GS.
- The project does not result in negative social, environmental and/or economic impacts.
- The project contributes to sustainable development.
- The project additionality is sufficiently justified in the VPA-DD.
- The project does not result in diversion of ODA.
- Conservative assumptions were applied in the project description.
- The monitoring plan of SDG parameters is transparent and adequate.
- The project meets all the stakeholder consultation requirements.
- The calculated emission reductions of **10,376 tCO_2e/year** are most likely to be achieved within the 2nd (second) crediting period of 7 years.

The conclusions of this report shows that the project, as it was described in the project documentation, is in line with all criteria applicable for the Renewal of crediting period.

Essen, 05/08/2024



Winter Stefan
TÜV NORD JI/CDM Certification Program
Validation Team Leader

Appendix 1. Abbreviations

Abbreviations	Full texts
ABPL	Africa Bioenergy Program Limited
BCE	Biodigester construction enterprise(s)
BEST	Biogas Extension Service Technicians (field coordinators)
BGTA	BioGas Thermal Application
BSUL	Biogas Solutions Uganda Ltd.
CAR	Corrective Action Request
CDM	Clean Development Mechanism
CL	Clarification Request
CME	Coordinating/Managing Entity
CO_2	Carbon dioxide
CO_2e	Carbon dioxide Equivalent
CP	Crediting Period
CSA	Community Services Activity
DCR	Design Certification Renewal
DNA	Designated National Authority
ER	Emission Reduction
FAR	Forward Action Request
fNRB	Non-renewable biomass (*fraction*), cf. applied GS methodology
GHG	Greenhouse gas(es)
GS	Gold Standard
GS4GG	Gold Standard for the Global Goals
HH	Household
IPCC	Intergovernmental Panel on Climate Change
LPG	Liquefied petroleum gas
MP	Monitoring Plan
MR	Monitoring Report
PA	Project Activity
PP	Project Participant
SDG	Sustainable Development Goal
SSC	Small Scale
QA/QC	Quality Assurance / Quality Control
UGX	Uganda Shillings
UNFCCC	United Nations Framework Convention on Climate Change
VPA-DD	Voluntary Project Activity Design Document
VVB	Validation and Verification Body
VVS	GS Validation and Verification Standard

Appendix 2. Competence of team members and technical reviewers

TÜVNORD

Statement of Competence

Appointment and authorization according to the procedures of the TÜV NORD JI/CDM Certification Program

Mr. Winter Stefan

SCHEME	STATUS: Assessor	Lead Assessor	Senior Assessor	Host Country Expert	Technical Reviewer	VALID UNTIL
	Validation, Verification					
ISO 14064-2			X		X	2026.07.27
VCS			X		X	2026.07.27
UER			X		X	2026.07.27
Gold Standard			X		X	2026.07.27
CDM			X		X	2026.07.27

Authorization status for technical areas within sectoral scopes:

CODE	TECHNICAL AREA
1.1	Thermal energy generation
1.2	Renewables
10.1	Fugitive emissions from oil and gas
13.1	Solid waste and wastewater
13.2	Manure
2.1	Energy distribution
3.1	Energy demand
4.1	Cement and lime production
4.2	Paper
5.2	Caprolactam, nitric and adipic acid
9.1	Aluminium and magnesium production
9.2	Iron, steel and Ferro-alloy production

163 - Rev. 09, Date: 2024-04-24

This document has been approved according to CERT-401-VA-007. Details are available from the QM-Department.

S01-VA060-F20 Rev. 04/02.23 Page 1 from 2

TÜV NORD Certification

Statement of Competence

Appointment and authorization according to the procedures of the TÜV NORD JI/CDM Certification Program

Mr. David Lubanga

SCHEME	STATUS	VALID UNTIL
CDM	Senior Assessor Technical Reviewer Host Country Expert (Kenya, Uganda, Rwanda, Tanzania, Burundi, Mali, Nigeria Ethiopia, Malawi, Ghana)	2025-09-30
Gold Standard	Senior Assessor Technical Reviewer Host Country Expert (Kenya, Uganda, Rwanda, Tanzania, Burundi, Mali, Nigeria Ethiopia, Malawi, Ghana)	2025-09-30

Authorization status for technical areas within sectoral scopes:

CODE	TECHNICAL AREA
1.2	Renewables
3.1	Energy demand
13.2	Manure

251 - Rev. 12, Date: 2023-06-15

251_S01-VA060-F20_20230615_rev12 S01-VA060-F20 rev3 | 2012-10-25

TÜVNORD

Statement of Competence

Appointment and authorization according to the procedures of the TÜV NORD JI/CDM Certification Program

Mr. Victor Claudio Abarca Arriagada

SCHEME	STATUS: Assessor	Lead Assessor	Senior Assessor	Host Country Expert	Technical Reviewer	VALID UNTIL
	Validation, Verification					
ISO 14064-2		x				2025-07-05
VCS		x				2025-07-05
UER		x				2025-07-05
CDM		x				2025-07-05

Authorization status for technical areas within sectoral scopes:

CODE	TECHNICAL AREA
1.2	Renewables
6.1	Construction
13.1	Solid waste and wastewater
13.2	Manure

420 - Rev. 4, Date: 2024-03-04

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TÜVNORD

Statement of Competence

Appointment and authorization according to the procedures of the TÜV NORD JI/CDM Certification Program

Ms. Alexandra Nuske

SCHEME	STATUS: Assessor	Lead Assessor	Senior Assessor	Host Country Expert	Technical Reviewer	VALID UNTIL
	Validation, Verification					
ISO 14064-2			X		X	2025.03.03
VCS			X		X	2025.03.03
UER			X		X	2025.03.03
Gold Standard			X		X	2025.03.03
CDM			X		X	2025.03.03
WKS			x		x	2025.03.03

Authorization status for technical areas within sectoral scopes:

CODE	TECHNICAL AREA
14.1	Afforestation and Reforestation
1.2	Renewables

095 - Rev. 10, Date: 2024-04-24

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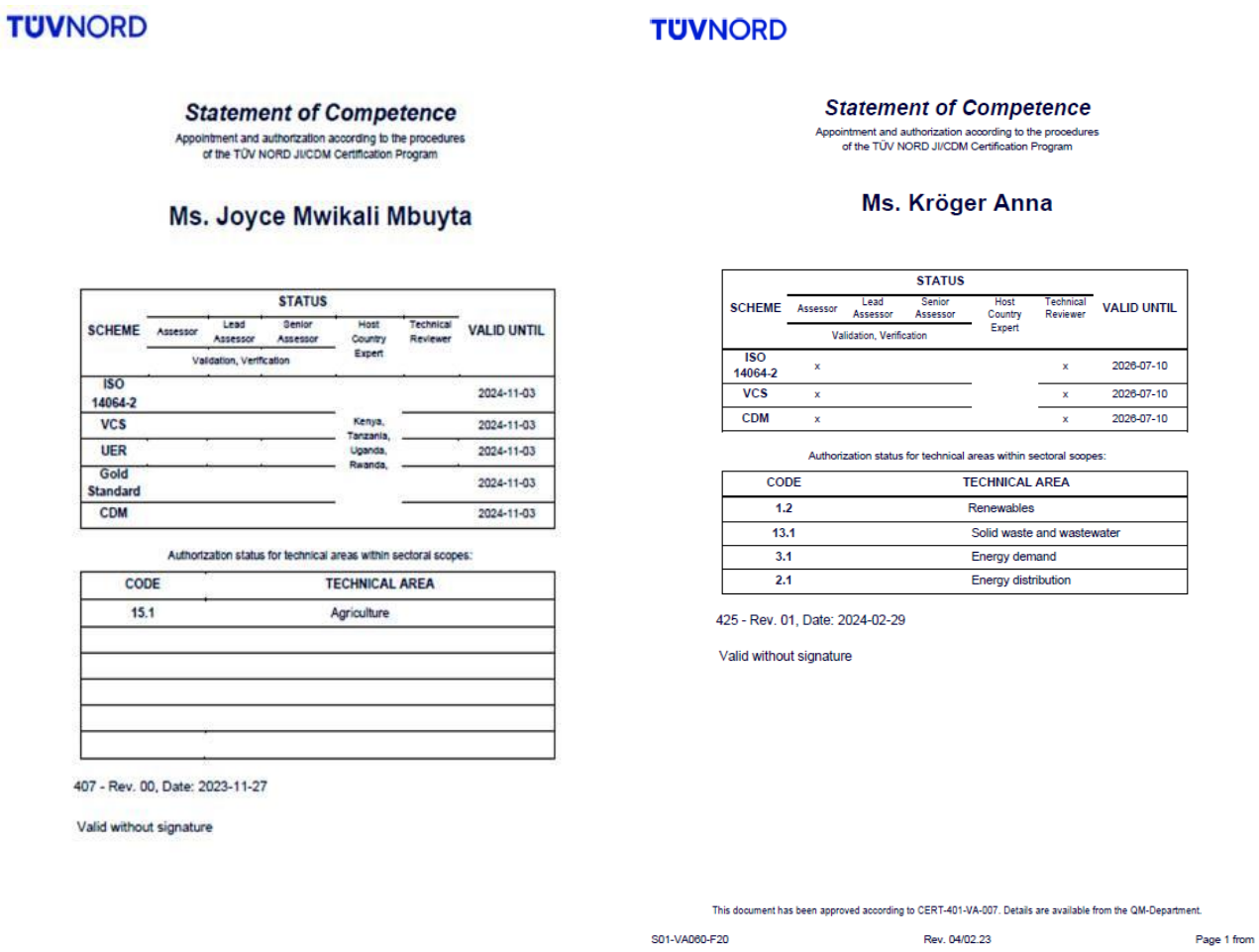
S01-VA060-F20 Rev. 04/02.23 Page 1 from 1



TÜVNORD

Statement of Competence

Appointment and authorization according to the procedures of the TÜV NORD JI/CDM Certification Program

Ms. Joyce Mwikali Mbuyta

SCHEME	STATUS: Assessor	Lead Assessor	Senior Assessor	Host Country Expert	Technical Reviewer	VALID UNTIL
	Validation, Verification					
ISO 14064-2				Kenya, Tanzania, Uganda, Rwanda,		2024-11-03
VCS						2024-11-03
UER						2024-11-03
Gold Standard						2024-11-03
CDM						2024-11-03

Authorization status for technical areas within sectoral scopes:

CODE	TECHNICAL AREA
15.1	Agriculture

407 - Rev. 00, Date: 2023-11-27

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TÜVNORD

Statement of Competence

Appointment and authorization according to the procedures of the TÜV NORD JI/CDM Certification Program

Ms. Kröger Anna

SCHEME	STATUS: Assessor	Lead Assessor	Senior Assessor	Host Country Expert	Technical Reviewer	VALID UNTIL
	Validation, Verification					
ISO 14064-2	x				x	2026-07-10
VCS	x				x	2026-07-10
CDM	x				x	2026-07-10

Authorization status for technical areas within sectoral scopes:

CODE	TECHNICAL AREA
1.2	Renewables
13.1	Solid waste and wastewater
3.1	Energy demand
2.1	Energy distribution

425 - Rev. 01, Date: 2024-02-29

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This document has been approved according to CERT-401-VA-007. Details are available from the QM-Department.

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Appendix 3. Documents reviewed or referenced

No.	Reference	Author	Title	References to the document	Provider
1.	**/VPA-DD-T/**	**GS**	Voluntary project activity design document form for GS Voluntary project activities – v1.1	https://cdm.unfccc.int/Reference/PDDs_Forms/index.html	Other
2.	**/CPM/**	**VVB**	TÜV NORD JI / CDM CP Manual (incl. CP procedures and forms)	-	Other
3.	**/GOT/**	**UNFCCC**	Glossary "CDM terms" – version 10.0	https://cdm.unfccc.int/filestorage/e/x/t/extfile-20150226124447549-glos_CDM.pdf/glos_CDM.pdf?t=UmZ8bnFjODI3fDCW9A3vJwR03kQQh4sbLiYu	Other
4.	**/IPCC/**	**IPCC**	1. 1996 IPCC Guidelines for National Greenhouse Gas Inventories: work book	www.ipcc-nggip.iges.or.jp	Other

No.	Reference	Author	Title	References to the document	Provider
			2. 2006 IPCC Guidelines for National Greenhouse Gas Inventories: work book 3. 2019 Refinement to the 2006 IPCC Guidelines for National Greenhouse Gas Inventories		
5.	**/KP/**	**UNFCCC**	Kyoto Protocol (1997)	http://unfccc.int/kyoto_protocol/items/2830.php	Other
6.	**/MA/**	**UNFCCC**	Decision 3/CMP. 1 (Marrakesh – Accords)	http://cdm.unfccc.int/Reference/COPMOP/index.html	Other
7.	**/Meth/**	**GS**	Methodology for Animal Manure Management and Biogas Use for Thermal Energy Generation v.1.1	https://globalgoals.goldstandard.org/standards/433_V1.1_TC_EE_ICS_Methodology-for-Animal-Manure-Management-and-Biogas-Use-for-Thermal-Energy-Generation.pdf	Other
8.	**/VVS/**	**GS**	GS validation and verification standard, v1.0	http://cdm.unfccc.int/Reference/Standards/index.html	Other
9.	**/PoA-DD/**	**CME**	Programme of Activities: “African Biogas Carbon Programme (ABC)” version 8.1 – 29/06/2020 Programme of Activities: “African Biogas Carbon Programme (ABC)” version 9.1 – 14/08/2023 Programme of Activities: “African Biogas Carbon Programme (ABC)” version 9.2 – 14/09/2023	-	CME
10.	**/CPM/**	**TÜV NORD**	TÜV NORD JI / CDM Certification Program Manual (incl. procedures and forms)	-	TÜV NORD
11.	**/DC/**	**TÜV NORD**	PoA Design Change Validation Report “African Biogas Carbon Programme (ABC)” v2.0, dated 03/01/2024		Other
12.	**/VPA-DD/**	**CME**	PoA GS2747: African Biogas Carbon Programme (ABC) - Kenya – VPA03 v.2.1 dated 21/08/2023 PoA GS2747: African Biogas Carbon Programme (ABC) - Kenya – VPA03 v.2.2 dated 02/03/2024 PoA GS2747: African Biogas Carbon Programme (ABC) - Kenya – VPA03 v.2.3 dated 24/03/2024 PoA GS2747: African Biogas Carbon Programme (ABC) - Kenya – VPA03 v.2.4 dated 13/05/2024 PoA GS2747: African Biogas Carbon Programme (ABC) - Kenya – VPA03 v.2.5 dated 12/07/2024		CME

No.	Reference	Author	Title	References to the document	Provider
			PoA GS2747: African Biogas Carbon Programme (ABC) - Kenya – VPA03 v.2.6 dated 05/08/2024		
13.	**/CER/**	**CME**	CER Agreement between ABPL and BUSL, dated 01/03/2023		CME
14.		**CME**	Sample warranty certificate/sales agreement for BSU/46 dated 11/112009		CME
15.		**CME**	BSUL declaration signed UNBS standard pdf		CME
16	**/BS/**	**CME**	Baseline Survey		CME
17.	**/TECH/**	**CME**	Technical Specifications Manual-		
18.	**/XLS/**	**CME**	KPT survey results Emission Reduction Calculations_v1.0, dated 16/08/2023 Emission Reduction Calculations_v2.0, dated 03/03/2024 Emission Reduction Calculations_v2.1, dated 13/05/2024		Other
19.	**/TA/**	**CME**	VPA Transition Annex		Other
20.	**/ipcc/**	**IPCC**	IPCC publications	www.ipcc-nggip.iges.or.jp	Other
21.	**/unfccc/**	**UNFCCC**	UNFCCC	http://cdm.unfccc.int	Other
22.	**/gs/**	**GS**	Gold Standard Foundation	https://energy.go.ke/https://globalgoals.goldstandard.org/all-documents/	Other
23.	**/XLS/**	**CME**	SDG survey analysis		CME
24.	**/MS%/**	**GS**	GS Email on MS Survey		CME
25.	**/fNRB/**	CME	Calculations of the fraction of non-renewable biomass (01MAR24 fNRB Uganda)		CME
26.	**/PSD/**	CME	first plant-Account_ KE-BOM-1303-10822 _ Salesforce - Enterprise Edition (002)		CME
27.	**/ODA/**	CME	Official Development Assistance Declaration		CME
28.	**/PARP/**	/GS/	GS4GG Programme of Activity requirements and procedures, v.2.0		
29.	**/GE/**	/GS/	GS4GG Gender Equality Requirements and Guidelines, v2.0		/GS/
30.	**/PR/**	/GS/	GS4GG Principles & Requirements, v1.2		/GS/
31.	**/CSA/**		GS4GG Community Services Activity Requirements, v1.2		/GS/
32.	**/SVR/**	/GS/	GS4GG Site Visit and Remote Audit Requirements and Procedures, v2.0		/GS/
33.	**/SS/**	/UNFCCC/	Standard - Sampling and surveys for CDM project activities and programmes of activities, v9.0		CDM
34.	**/SG/**	/UNFCCC/	Guideline - Sampling and surveys for CDM project activities and programmes of activities, v4.0		CDM
35.	**/GR/**	/CME/	Grievances final VPA03 Uganda		CME

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

Table 2. CL from this validation

CL ID	**01**	**Section no.**	**B.2**	**Date: 25/09/2023**
Description of CL				
VPA-DD version 2.1, Section B.2 The CME is required to clarify if Tier 2 will also be applied in the quantification of emission reductions, and to include all relevant BE_y, PE_y & LE_y equations, and parameters in the VPA monitoring plan. The CME shall also explain how this approach is in line with the PoA framework objectives.				
Project participant response (1st round)				**Date: 01/03/2024**
The VPA-DD is simplified to Tier 1 only. All references to Tier 2 are removed				
Documentation provided by project participant (1st round)				
☒ Changes in the PDD			Section(s): B.2	New version No.: 2.2
☐ Changes in MR			Section(s):	New version No.:
☐ Changes in XLS			Worksheet(s):	New version No.:
☐ Other:				
VVB assessment (1st round)				**Date: 19/03/2024**
VPA-DD version 2.2, Section B.2 Only Tier 1 (AWMS Method 1 applied) is considered. The VPA-DD is updated accordingly.				
Conclusion *Tick the appropriate checkbox*	☐ Additional action should be taken (finding remains open) ☒ The finding is closed			

CL ID	**02**	**Section no.**	**B.3**	**Date: 25/09/2023**
Description of CL				
VPA-DD version 2.1, Section B.3 The project boundary shall be defined in line with Section 3.2 of the applied methodology. All GHG and sources shall be included in the table, including for AWMS method 2 (Tier 2) if applicable				
Project participant response (1st round)				**Date: 01/03/2024**
All are now included and as CL01, and only for the applied method (AWMS method 1)				
Documentation provided by project participant (1st round)				
☒ Changes in the PDD			Section(s): B.3	New version No.: 2.2
☐ Changes in MR			Section(s):	New version No.:
☐ Changes in XLS			Worksheet(s):	New version No.:
☐ Other:				
VVB assessment (1st round)				**Date: 19/03/2024**
VPA-DD version 2.2, Section B.3 The project boundary is as per the applied GS Methodology, and the GHGs and sources are considered with regards to Tier 1 approach.				
Conclusion *Tick the appropriate checkbox*	☐ Additional action should be taken (finding remains open) ☒ The finding is closed			

CL ID	03	Section no.	B.6.1	Date: 25/09/2023
Description of CL				
VPA-DD version 2.1, Section B.6.1 1. In the calculation of project emissions for Tier 1 approach, the CME has introduced a third component in the equation, not consistent with the provisions of the applied methodology as follows: - $PE_{AWMS,y} = PE_{PL,y} + PE_{power,y}$ + PE$_{\text{continued baseline}}$ A correction or clarification is required. 2. The equation for $EF_{awms,h}$ is included under the tab PE_LE: The CME is required to clarify application of the same in the project activity				
Project participant response (1st round)				**Date: 01/03/2024**
1. The mathematical derivation is correct. However, in an attempt to simply the calculations and to speed up the review, this is now updated. For both BE and PE AWMS only the share of manure is taken into account which would decay anaerobically in absence of the project. Thus, if a farmer has 10 cows, but only the waste of 5 cows is fed, then only 50% of the baseline is affected, This is captured in the parameter $MS\%_{i,j}$ which is in full compliance with the methodology 2. This is now removed.				
Documentation provided by project participant (1st round)				
☒ Changes in the PDD		Section(s): B.6.1		New version No.: 2.2
☐ Changes in MR		Section(s):		New version No.:
☐ Changes in XLS		Worksheet(s):		New version No.:
☐ Other:				
VVB assessment (1st round)				**Date: 19/03/2024**
VPA-DD version 2.2, Section B.6.1 1. Equation 10 is corrected and in line with the methodology. 2. Removed as requested				
Conclusion *Tick the appropriate checkbox*	☐ Additional action should be taken (finding remains open) ☒ The finding is closed			

Table 3. CAR from this validation

CAR ID	01	Section no.	All	Date: 25/09/2023
Description of CAR				
VPA-DD version 2.1, Template An incorrect VPA-DD template v1.1 has been applied for design certification renewal. The CME is requested to apply the latest version of the VPA-DD template, and to complete all sections in line with the guideline.				
Project participant response (1st round)				**Date: 01/03/2024**

Please see CAR01 of the PoA-DD design change were the same was raised – the same argument applies to the VPA-DDs. TÜV Nord agreed with this.

Table 2. CARs from this validation

CAR ID	01	Section no.	All	Date: 07/08/2023
Description of CAR				
PoA-DD version 9.0, Template The applied PoA-DD template v1.1 is not the latest and valid version. 1. The PP is required to adopt the latest template, and ensure all sections are completed as required by the GS PoA-DD template guide v2.2 2. The Design Change Memo shall be completed in Appendix 2 3. The CME shall provide the document in clean and tracked changes				
Project participant response (1st round)				**Date: 14/08/2023**
This is not required and discussed with SC on the 7th of June 2023. The SC response was not the same as advice earlier received, where it was stated that it is only possible to transition to PoA standard 2.0 with renewal instead it is now stated we can voluntarily adopt the newest standard. However, given that all documents were developed by that time, it was decided to stick to v1.1., which is allowed. The email evidence stating this is attached.				

Documentation provided by project participant (1st round)			
☒	Changes in the PDD	Section(s): All	New version No.: 9.1
☐	Changes in MR	Section(s):	New version No.:
☐	Changes in XLS	Worksheet(s):	New version No.:
☒	Other:	File: SC 07June2023 communication on PoA standard adoption and template use	
VVB assessment (1st round)			**Date: 19/08/2023**
PoA-DD version 9.1, Template The latest PoA-DD template is not applicable as explained and confirmed via an email from the GS/em/. Template version 1.1. is still applicable. Therefore all above issues have been resolved or are obsolete.			
Conclusion *Tick the appropriate checkbox*	☐ Additional action should be taken (finding remains open) ☒ The finding is closed		

Documentation provided by project participant (1st round)			
☒	Changes in the PDD	Section(s): All	New version No.: 2.2
☐	Changes in MR	Section(s):	New version No.:
☐	Changes in XLS	Worksheet(s):	New version No.:
☐	Other:		
VVB assessment (1st round)			**Date:19/03/2024**
VPA-DD version 2.2 Resolved at PoA-DD level. No further action is required			
Conclusion *Tick the appropriate checkbox*	☐ Additional action should be taken (finding remains open) ☒ The finding is closed		

CAR ID	02	Section no.	Methodology	Date: 25/09/2023
Description of CAR				
VPA-DD version 2.1, Applied methodology. The CME has not applied the correct methodology version 'Methodology for animal manure management and biogas use for thermal energy generation V1.1'.				
Project participant response (1st round)				**Date: 01/03/2024**
This is updated throughout the VPA-DD				
Documentation provided by project participant (1st round)				
☒ Changes in the PDD			Section(s): Applied methodology	New version No.: 2.2
☐ Changes in MR			Section(s):	New version No.:
☐ Changes in XLS			Worksheet(s):	New version No.:
☐ Other:				
VVB assessment (1st round)				**Date: 19/03/2024**
VPA-DD version 2.2, Applied methodology. The validation team confirm that version 1.1 is applicable and applied throughout the updated VPA-DD and Validation Report.				
Conclusion *Tick the appropriate checkbox*	☐ Additional action should be taken (finding remains open) ☒ The finding is closed			

CAR ID	03	Section no.	A.1	Date: 25/09/2023
Description of CAR				
VPA-DD version 2.1, Section A.1 The CME is required to provide further details on the implementation status of the project at design certification renewal, including important dates, number of digesters, locations covered, and any changes that might have occurred during the first VPA crediting period.				
Project participant response (1st round)				**Date: 01/03/2024**
This is now added in section 1				
Documentation provided by project participant (1st round)				
☒ Changes in the PDD			Section(s): A.1	New version No.: 2.2
☐ Changes in MR			Section(s):	New version No.:
☐ Changes in XLS			Worksheet(s):	New version No.:
☐ Other:				
VVB assessment (1st round)				**Date: 19/03/2024**
VPA-DD version 2.2, Section A.1 Section A.1 of the updated VPA-DD includes the project implementation status. Indicates total units installed and the usage rate				
Conclusion *Tick the appropriate checkbox*	☐ Additional action should be taken (finding remains open) ☒ The finding is closed			

CAR ID	04	Section no.	B.6.1	Date: 25/09/2023
Description of CAR				
VPA-DD version 2.1, Section B.6.1: Calculation of fNRB 1. The CME is requested to include the stepwise fNRB calculation, including choice and justification of the data applied. 2. The CME shall compare the values with literature, in line with the requirements paragraph 6 b) of the CDM Methodological TOOL30, version 4.0				
Project participant response (1st round)				**Date: 01/03/2024**

1. Section 6.1 refers to the method, not about the chosen data.

2. Please review critically and see the comment box in section B.6.2 All is reviewed and compared. An additional reference is added in the excel.

Documentation provided by project participant (1st round)		
☒ Changes in the PDD	Section(s): B.6.2	New version No.: 2.2
☐ Changes in MR	Section(s):	New version No.:
☐ Changes in XLS	Worksheet(s):	New version No.:
☐ Other:		

VVB assessment (1st round)	**Date: 19/03/2024**

VPA-DD version 2.2, Section B.6.1: Calculation of fNRB

1. PD is required to justify the value of the parameters for the calculations of H in the fNRB calculations applied to be in line with the provisions of the CDM Methodological TOOL30.
2. A justification is included in the fNRB workbook on the differences between the Bailis et al (2015) report and the calculated value. The validation team deems the justification credible and reasonable.

Project participant response (2nd round)	**Date: 29/07/2024**

The justification for utilizing government data over UN data is detailed in the registration review form. As per CDM tool 30, a comparison of government and UN data is required. This comparison, documented in the review form, demonstrates that UN data tends to be less conservative. We have opted for a more conservative approach to mitigate the potential risk of overestimating the fNRB. Therefore, the data sources used for our calculations align with the recommendations of the tool while prioritizing a conservative methodology.

Documentation provided by project participant 2nd round)		
☒ Changes in the PDD	Section(s): B.6.2	New version No.: 2.5
☐ Changes in MR	Section(s):	New version No.:
☒ Changes in XLS	Worksheet(s): fNRB	New version No.:
☐ Other:		

VVB assessment (2nd round)	**Date: 31/07/2024**

VPA-DD version 2.5, Section B.6.1: Calculation of fNRB

The PD has applied more conservative values compared to the sources sited by the GS reviewer. The validation team has included detailed assessments in Section D.4 of this report, of the parameter values applied per CDM Tool 30 v4.0

Conclusion *Tick the appropriate checkbox*	☐ Additional action should be taken (finding remains open) ☒ The finding is closed

CAR ID	**05**	**Section no.**	**B.6.2**	**Date: 25/09/2023**
Description of CAR				

VPA-DD version 2.1, Section B.6.2

The following is observed: -

1. The data source for the parameter BGTA 7.5 is not correct.
2. For the parameter BGTA 8, the methodology only provides two options for determining the ex-ante values. However, the CME has applied baseline survey values.
3. For the parameter BGTA 9, the methodology only provides one option for determining the ex-ante value. However, the CME has applied baseline survey values.
4. For selection of the parameter BGTA 13, BGTA 14, BGTA 15, BGTA 16 values for charcoal, The CME shall clarify if charcoal production is an activity under the VPA
5. The parameter BGTA 19 is included but not applied under the VPA
6. The parameter BGTA 22 is included but not applied under the VPA
7. The applied BGTA 41 ($fNRB_{,i,y}$) value is not in line with the spreadsheet

Project participant response (1st round)	**Date: 01/03/2024**

1. This is now corrected.
2. BGTA 1 is about double counting, the certificates are the written assertions and this is in compliance with the methodology.
3. Default EF is now applied or default values are calculated as per IPCC instruction for default values, See section B.6.2 for the method.
4. The project reduces demand and therefore production. This is already approved in CPI, and this remains the same. No additional justification is required.
5. It is clearly stated in the VPA-DD that the VPA implementer may opt for method 2 in case remote sensors become more available and affordable. The MR will describe this.
6. See #5
7. Revised and is now aligned

Documentation provided by project participant (1st round)		
☒ Changes in the PDD	Section(s): B.6.2	New version No.: 2.2
☐ Changes in MR	Section(s):	New version No.:
☐ Changes in XLS	Worksheet(s):	New version No.:
☐ Other:		

VVB assessment (1st round)	**Date: 19/03/2024**

VPA-DD version 2.2, Section B.6.2

1. The sources of the parameter BGTA 7.5 is now corrected to CDM Methodological Tool 33
2. A sample assertion on double counting by way of user carbon waiver is provided.
3. The PD has updated the values based on 2019 IPCC values and calculated the same as provided for the IPCC for any missing values. The reference is updated per the correct IPCC source, for low productivity tropical systems suitable for the project area.
4. No further action is required.
5. The relevance of the parameter BGTA 19 is clarified.
6. The relevance of the parameter BGTA 19 is clarified.
7. The fNRB value has been updated based on the latest submission.

Conclusion *Tick the appropriate checkbox*	☐ Additional action should be taken (finding remains open) ☒ The finding is closed

CAR ID	06	Section no.	B.6.2	Date: 25/09/2023

Description of CAR

VPA-DD version 2.1, Section B.6.2

The parameter BGTA 20 ($P_{b,i,y}$):

1. The estimated value has increased from 3.380 tons/hh/year in CPI to 3.750 tons/hh/year for CPII. The CME is requested to provide a justification for the increase.

2. The CME shall also provide data on household size either from baseline survey or published and reliable literature.

3. Further, the CME shall compare the value of the baseline fuel consumption with credible literature value as prescribed by the methodology.

4. The CME shall determine if $P_{b,i,y}$ is higher than the threshold value, and substantiate the same.

Project participant response (1st round) — **Date: 01/03/2024**

1. The confidence/prevision level is 90/30, the value of 3.750 is well within the precision level of 3.380 (lower and upper boundary of 30% ± 1.014). The VVB is commenting here on a 1.4% difference in the value. No justification is required as statistically there is no difference.

2. Baseline date is provided, see BGTA 6 for example.

3. This is only required when default values are applied. See the description of BGTA20.

4. This is now added in the respective table in section B.6.2

Documentation provided by project participant (1st round)

☒	Changes in the PDD	Section(s): B.6.2	New version No.: 2.2
☐	Changes in MR	Section(s):	New version No.:
☐	Changes in XLS	Worksheet(s):	New version No.:
☐	Other:		

VVB assessment (1st round) — **Date: 19/03/2024**

VPA-DD version 2.2, Section B.6.2

1. The PD has offered a justification for the difference as it is statistically within the 90/30 precision level.
2. The baseline data is provided under the parameter and the same will be repeated at first verification under the updated 2019 IPCC. FAR 01 has been raised.
3. Not required when default IPCC or methodology values are applied. The PD is requested as the reported values are based on survey results (KPT)
4. The values are based on MRV results and therefore accepted

Project participant response (2nd round) — **Date: 02/03/2024**

3. As per methodology: ***If*** *the values resulting from the baseline KPTs are higher than the following* ***threshold value*** *(on equivalent terms),* ***then the results shall be further*** *substantiated by independent third-party studies that are specific to the project region, including but not limited to government publications, peer-reviewed literature, third party assessments (for example – WISDOM, FAO, UN and similar organisations) and/or official data or statistics about cooking technologies and fuel use*.

   The PD demonstrated that the values are lower than threshold value in the additional comments, and therefore it is not required to further substantiate the results.

Data/parameter	BGTA 20: $P_{b,i,y}$
Unit	tonnes/household/year
Description	Average yearly consumption of baseline fuel i per household at the renewal of each crediting period
Source of data	KPT, Sheet BE in VPA03 SDG database cell E67-, E72 and E77
Value(s) applied	Wood: 3.750 Charcoal 0.294 LPG: 0.00
Choice of data or Measurement methods and procedures	Baseline fuel test
Purpose of data	Calculation of baseline scenario

Additional comment	Applicable for Thermal application method 1 and Thermal application method 2 -The value is much lower than the cap value. The average hh size is 7.191 (parameter GSDM-I7.1.1: HHs), and thus the per capita wood use is 3.750/7.191= 0.52 ton/person/year (cap =0.75 ton/person/year) and for charcoal 0.294/7.191= 0.086 ton/person/year (cap = 0.25 ton/person/year) Note that in the baseline survey the hh size is 7.91 (see BGTA6), but in the first monitoring 7.191 (see GSDM-I7.1.1: HHs). The lowest value is applied which is conservative

Documentation provided by project participant (1st round)		
☒ Changes in the PDD	Section(s): B.6.2	New version No.: 2.2
☐ Changes in MR	Section(s):	New version No.:
☐ Changes in XLS	Worksheet(s):	New version No.:
☐ Other:		
VVB assessment (2nd round)		**Date: 27/03/2024**
VPA-DD version 2.2, Section B.6.2 The values are lower than the per capita caps for baseline fuel wood and charcoal. No further action is required.		
Conclusion *Tick the appropriate checkbox*	☐ Additional action should be taken (finding remains open) ☒ The finding is closed	

CAR ID	07	Section no.	B.6.4	Date: 25/09/2023
Description of CAR				
VPA-DD version 2.1, Section B.6.4 The reported values for GSDM-I13.2.1 & GSDM-I.5.4.1 are not in line with the calculated estimates in the relevant spreadsheet. .				
Project participant response (1st round)				**Date: 01/03/2024**
Both are now updated and consistent.				
Documentation provided by project participant (1st round)				
☒	Changes in the PDD	Section(s): B.6.4		New version No.: 2.2
☐	Changes in MR	Section(s):		New version No.:
☐	Changes in XLS	Worksheet(s):		New version No.:
☐	Other:			
VVB assessment (1st round)				**Date: 19/03/2024**
VPA-DD version 2.2, Section B.6.4 The values for the SDG parameters GSDM-I13.2.1 & GSDM-I.5.4.1 have been updated and now consistent with the impact tool				
Conclusion *Tick the appropriate checkbox*	☐ Additional action should be taken (finding remains open) ☒ The finding is closed			

CAR ID	08	Section no.	B.6.4	Date: 25/09/2023
Description of CAR				
VPA-DD version 2.1, Section B.7.1 1. Please clarify the difference between parameters BGTA 26 ($NL_{T,y}$) & BGTA 30 ($N_{p,y}$) 2. The measurement method applied for the parameter BGTA 31 is not in line with the two methods prescribed by the methodology. 3. Unclear how the parameter BGTA 33 has been applied under the VPA-DD 4. The values for the parameter BGTA 42 are not traceable from the cited source. 5. The estimated value for the SDG parameter GSDM-I5.4.1 is not in line with the spreadsheet value.				
Project participant response (1st round)				**Date: 01/03/2024**
1. These are the same and had to be included as per applied methodology. 2. There are no IPCC default values for digester feeding fraction. See additional comments in the referred to table. This is elaborated upon. 3. This applies to method 2 only. That method is not applied. 4. This is from the latest approved MR. That report is publicly available and now also included in the folder evidence. 5. This is now updated.				
Documentation provided by project participant (1st round)				
☒	Changes in the PDD	Section(s): B.7.1		New version No.: 2.2
☐	Changes in MR	Section(s):		New version No.:
☐	Changes in XLS	Worksheet(s):		New version No.:
☐	Other:			
VVB assessment (1st round)				**Date: 19/03/2024**

VPA-DD version 2.2, Section B.7.1 1. BGTA 26 ($NL_{T,y}$) & BGTA 30 ($N_{p,y}$) are the same parameter as described by the methodology. $NL_{T,y}$ is applied for both Method 1 and Method 2. 2. The methodology (page 47) prescribes IPCC defaults for Method 1 only for $MS\%_{i,y}$. Clarify 3. Method two has been excluded and therefore the issue is closed. 4. The values of the biomass consumption in the project case ($BB_{p1,\,bio}$) are sourced from the latest approved monitoring report (MRV) 5. The value of the GSDM-I5.4.1 has been updated			
Project participant response (1st round)			**Date: 26/03/2024**
2. as argued before, we are allowed to survey MS. However, in order to close this finding, the GS has been consulted, and they agree with us. See the file "*GS evidence method one can survey MS email communication"* in the response package			
Documentation provided by project participant (1st round)			
☒	Changes in the PDD	Section(s): B.7.1	New version No.: 2.3
☐	Changes in MR	Section(s):	New version No.:
☐	Changes in XLS	Worksheet(s):	New version No.:
☒	Other: GS evidence method one can sur		
VVB assessment (1st round)			**Date: 27/03/2024**
VPA-DD version 2.3, Section B.7.1 As per the applied methodology (page 11), The project developer may apply the default IPCC values or conduct surveys to assess the animal manure management practices in the baseline. The same has also been confirmed by GS via email/MS%/.			
Conclusion *Tick the appropriate checkbox*	☐ Additional action should be taken (finding remains open) ☒ The finding is closed		

Table 4. FARs from this validation

FAR ID	**01**	**Section no.**	B.6.1	**Date: 01/05/2024**
Description of FAR				
Baseline Survey, 1. The baseline survey study was conducted based on 2006 IPCC provisions. The same shall be repeated at first verification following the requirements of the 2019 IPCC procedures for baseline parameters BGTA 5, BGTA 6, BGTA 8, BGTA 9, and BGTA 31. 2. The verifying VVB shall ensure to confirm during the site visit that only households with similar soci-economic characteristics to the project households and did not own a biodigester prior to the survey are included in the survey sample.				
Project participant response				**Date: 03/05/2024**
That is correct, see the additional comments and remark in the MR. This is an activity we will execute for the first verification.				
Documentation provided by project participant				
☐	Changes in the PDD	Section(s):	New version No.:	
☐	Changes in MR	Section(s):	New version No.:	
☐	Changes in XLS	Worksheet(s):	New version No.:	
☐	Other:			
VVB assessment				**Date: DD/MM/YYYY**
-				
Conclusion *Tick the appropriate checkbox*	☒ Additional action should be taken (finding remains open) ☐ The finding is closed			