

GOLD STANDARD VERIFICATION REPORT

1st Periodic Verification

“African Biogas Carbon Programme (ABC) –
Uganda– VPA003”

VPA ID: GS4236

POA

African Biogas Carbon Programme (ABC)

POA ID: GS2747

MONITORING PERIOD:

FROM 19/04/2015 TO 31/08/2017

AENOR Reference n^o: 2017/100/VOL/49

"1st" PERIODIC VERIFICATION

"African Biogas Carbon Programme (ABC) – Uganda– VPA003"

Verification Report:	AENOR Reference nº:		Version of this document:	Date of this rev.:
	2017/100/VOL/49		03	12/07/2018
Project:	Title:		Registration date:	GS Reference
	African Biogas Carbon Programme (ABC) – Uganda– VPA003		19/04/2017	4236
Project Participant(s):	Biogas Solutions Uganda Ltd		-	
	Host Party:		Other involved Parties:	
	Uganda		-	
Applied methodology/ies:	Title:		Code:	Version
	Technologies and Practices to Displace Decentralized Thermal Energy Consumption		TVPA-DDTEC	1.0
Monitoring report:	Title:		Draft version:	Final version:
	African Biogas Carbon Programme (ABC) – Uganda– VPA003 (ID GS4236).		1.0	3.0
Emission reductions:	Monitoring period:	Verified amount	As per draft MR:	As per VPA-DD:
	19/04/2015 - 31/08/2017	38,103	34,419	15,705
Previous versions of this document:			Version:	Date:
			1	17/05/2018
			2	23/05/2018
Summary of verification:	<p>AENOR INTERNACIONAL S.A.U., hereinafter AENOR, has performed the verification of the emission reduction of the small-scale VPA "African Biogas Carbon Programme (ABC) – Uganda– VPA003". This VPA is located in the communities of Uganda, where domestic biodigesters have been disseminated as a local, sustainable energy source through the development of a commercial, market oriented sector. The objectives of the verification are to confirm that the project comply with GS criteria and follows the approved GS methodology "Technologies and Practices to Displace Decentralised Thermal Energy Consumption" version 1.0 and that the Monitoring Report presented by HIVOS will lead to a realistic determination of the emissions reductions of the project activity. A risk based verification approach was employed to identify key risks to emission reduction estimations. During the on-site visit it was verified the quality assurance of the data concern in the calculation of the emission reduction. The installation of the biodigesters was also verified and the monitoring control procedures were also assessed.</p> <p>AENOR confirms that the project is implemented in accordance with</p>			

	<p>approved Voluntary Project Design Document and the monitoring plan. The monitoring system is in place and the emission reductions are calculated without material misstatements. Our opinion relates to the project GHG emissions and the resulting GHG emission reductions reported and related to the valid and approved registered project baseline and monitoring and its associated documents. Clarifications and corrective actions on a number of issues were requested by AENOR according to the desk review and on-site visit conclusions; these were amended satisfactorily by HIVOS and resulted in a new version of the original MR.</p> <p>Based on the information checked and evaluated, AENOR is able to certify that the emissions reductions from the "African Biogas Carbon Programme (ABC) - Uganda- VPA003" project during the period from 19/04/2015 - 31/08/2017 amounts to 38,103 tonnes of CO₂ equivalent.</p> <p>The vintage breakdown of Emission reductions verified is as follows:</p> <table border="1" data-bbox="464 741 1508 1070"> <thead> <tr> <th data-bbox="464 741 986 808">Vintage (year)</th> <th data-bbox="986 741 1508 808">Emission Reductions (tCO_{2e})</th> </tr> </thead> <tbody> <tr> <td data-bbox="464 808 986 875">2015</td> <td data-bbox="986 808 1508 875">10,487</td> </tr> <tr> <td data-bbox="464 875 986 943">2016</td> <td data-bbox="986 875 1508 943">16,188</td> </tr> <tr> <td data-bbox="464 943 986 1010">2017</td> <td data-bbox="986 943 1508 1010">11,428</td> </tr> <tr> <td data-bbox="464 1010 986 1070">Total</td> <td data-bbox="986 1010 1508 1070">38,103</td> </tr> </tbody> </table>	Vintage (year)	Emission Reductions (tCO _{2e})	2015	10,487	2016	16,188	2017	11,428	Total	38,103
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2016	16,188										
2017	11,428										
Total	38,103										
Report prepared by:	Climate Change Unit. AENOR										

Abbreviations

AENOR	AENOR INTERNACIONAL S.A.U
BFT	Baseline Fuel Test
BSUL	Biogas Solutions Uganda Ltd
BUS	Biogas User Survey
CAR	Corrective action request
CDM	Clean Development Mechanism
CL	Clarification
SSC-VPA-DD	Voluntary Programme Activity Design Document
SSC-PoA-DD	Small Scale Programme Of Activities Design Document
VER	Voluntary emission reductions
CME	Coordinating and Managing Entity
DNA	Designated national authority
EB	Executive Board of the CDM of the Kyoto Protocol
GHG	Greenhouse Gasses
GS	Gold Standard
FAR	Forward Action Request
IPCC	Intergovernmental Panel on Climate Change
KPT	Kitchen Performance Test
MP	Monitoring plan
MWh	Megawatt hour
NGO	Non-Governmental Organization
PP	Project Participant
PFT	Project Performance Test
tC	Carbon tonne
TVPA-DDTEC	Gold Standard's 'Technologies and practices to displace decentralized thermal energy' version 1.0

TJ	Terajoule
UBP	Uganda Biogas Programme
UNFCCC	United Nations Framework Convention on Climate Change

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1 INTRODUCTION

HIVOS commissioned AENOR to carry out the verification and certification of the emission reductions generated by "African Biogas Carbon Programme (ABC) – Uganda– VPA003" project in Uganda (the project) for the period 19/04/2015 - 31/08/2017. This report contains the findings from the verification and a certification statement for the certified emission reductions.

1.1 Objective

The purpose of the verification is the periodic independent review and determination by the DOE of the monitored reductions in anthropogenic emissions by sources of GHG that have occurred as a result of a registered GS project activity during the verification period.

Certification is the written assurance by the DOE that, during a specified time period, a project activity achieved the reductions in anthropogenic emissions by sources of greenhouse gases as verified.

1.2 Scope

The verification, as an independent and objective review, shall assess and verify that the implementation of the project activity and the steps taken to report emission reductions comply with the GS criteria and relevant guidance provided by the GS Board. The verification shall:

1. Ensure that the project activity has been implemented and operated as per the PoA-DD /1/ and VPA-DD /2/ and that all physical features (technology, project equipment, and monitoring and metering equipment) of the project are in place. It is, therefore, necessary to:
 - Interview relevant personnel to confirm that the operational and data collection procedures are implemented in accordance with the revised monitoring plan.
 - Check the monitoring equipment, including calibration performance and observations of monitoring practices, against the requirements of the revised VPA-DD and the selected methodology.
 - Check that the manual operating provisions are duly followed (processes, routines, instructions, forms and the like).
2. Ensure that the monitoring report and other supporting documents provided are complete and verifiable and in accordance with applicable GS requirements. It is, therefore, necessary to:
 - Review relevant documentation and conduct an on-site visit(s).
 - Review data and information presented to verify their completeness.
 - Review indicators that must be addressed in the revised monitoring plan.
 - Review the revised monitoring plan and monitoring methodology, paying particular attention to the frequency of measurements, the quality of metering equipment including calibration requirements, and the quality assurance and quality control procedures.

3. Ensure that actual monitoring systems and procedures comply with the monitoring systems and procedures described in the revised monitoring plan and the approved methodology, carrying out:
 - A review of information flows for generating, aggregating and reporting the monitoring parameters.
 - A cross-check between information provided in the monitoring report and data from other sources such as plant logbooks, inventories, purchase records or similar data sources.
 - A review of calculations and assumptions made in determining the GHG data and emission reductions.
 - A review of the project documentation provided by the project participant to check that is based upon both quantitative and qualitative information on emission reductions. Quantitative information comprises the reported numbers in the monitoring report submitted to the DOE. Qualitative information comprises information on internal management controls, calculation procedures, and procedures for transfer of data, frequency of emissions reports, and review and internal audit of calculations.
4. Evaluate the data recorded and stored as per the monitoring methodology, carrying out:
 - An evaluation of data management and the quality assurance and quality control system in the context of their influence on the generation and reporting of emission reductions.
 - Identification of quality control and quality assurance procedures in place to prevent or identify and correct any errors or omissions in the reported monitoring parameters.
5. Identify and inform the project participant of any concerns related to the project's activity and operation conformance with the revised project design document. Project participant shall address the concerns and supply additional relevant information.
6. Provide a verification report to the project participant, the Parties involved and the GS Board. The report shall be made publicly available.

The verification is not meant to provide any consultancy services to the client. However, stated requests for clarifications and/or corrective actions may provide input for improvement of the monitoring report.

AENOR, based on the Specific Instruction for the Validation, verification and certification of clean development mechanism (CDM) project activities (IE/DTC/039) /3/, which is in turn based on the last CDM requirements, has used a risk-based approach in the verification, focusing on the identification of significant risks for the generation of ERs and verifying the mitigation measures for these issues.

1.3 Description of the Project Activity

Host Country:	Uganda
Title of project activity:	"African Biogas Carbon Programme (ABC) – Uganda-VPA003"
GS registration No:	4236

Project Participant: Biogas Solutions Uganda Ltd
Plot 36 Luthuli Rise, Bugolobi, Kampala, Uganda
+ 0750 899 238/ 0750 899 236

Location of the project activity: Uganda

Project's crediting period: 19/04/2015 to 18/04/2022 (retroactive and renewable)

Verification period: 19/04/2015 - 31/08/2017

VPA Inclusion date: 19/04/2017

The validation and previous verifications are summarized below:

Process	DOE	Crediting period	Date	Amount of CERs
Validation	AENOR	19/04/2015 to 18/04/2022	19/04/2017	63,800
1 st verification	AENOR	19/04/2015 to 31/08/2017	-	-

2 METHODOLOGY

The verification has assessed the quality of the information, including:

- A desk review of the relevant information of all issues that constitute the basis for emission reductions from the project.
- On-site inspections; a review of performance records, interviews with project participant and local stakeholders, collection of measurements, observation of established practices and testing of equipment.
- A review of additional data from other sources relevant to the project activity's resulting emission reductions (tests, calculation of the Non-Renewable Biomass, etc).

Special focus is given on:

- The proper implementation of the project as described in the VPA-DD
- The data collection system, verifying that it meets the requirements of the revised monitoring plan as per the applied methodology.
- Whether sufficient evidence is available, both in terms of frequency (time period between evidence) and in covering the full monitoring period.
- The source and nature of the evidence (external or internal, oral or documented).

The available information from sources other than that used in the last version of the monitoring report were cross-checked against the data in the monitoring report to confirm that the stated figures included in it are correct.

The verification of the emission reductions has assessed all factors and issues that constitute the basis for emission reductions from the project. Some mistakes were identified and subsequently corrected. These findings are detailed in Chapter 5 and they were successfully closed.

2.1 Verification Steps

Preparations: From 15/11/2017 to 21/11/2017

On-site verification: From 22/11/2017 to 24/11/2017

Reporting: From 25/11/2017 to 12/07/2018

2.1.1 Appointment of team members and technical reviewers

The list of involved personnel and the qualification status are summarized in the table below. The details of the persons that visited the project site are included as well.

Function	Qualification in Technical Area related with the project activity	Name	Visited the project site YES/NO
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Function	Qualification in Technical Area related with the project activity	Name	Visited the project site YES/NO
Team Leader	1.2	Marcelino Pellitero Martínez	NO
Verifier	1.2	Alfonso Medrano Gutiérrez	YES
Verifier	1.2	Mercedes Garcia Madero	NO
Technical Reviewer	1.2	Elena Llorente Perez	NO

Technical areas (TA) mentioned above correspond to the following:

TA code	Technical area
1.1	Thermal energy generation
1.2	Renewables
2.1	Energy distribution
3.1	Energy demand
4.1	Cement and lime production
5.1	Chemical industry
5.2	Caprolactam, nitric and adipic acid
6.1	Construction
7.1	Transport
8.1	Mining/mineral production
9.1	Aluminium and magnesium production
9.2	Iron, steel and Ferro-alloy production
10.1	Fugitive emissions from oil and gas
11.1	Emissions of fluorinated gases
11.2	Refrigerant gas production
12.1	Chemical industry

TA code	Technical area
13.1	Solid waste and wastewater
13.2	Manure
14.1	Afforestation and reforestation
15.1	Agriculture
16.1	Carbon capture and storage

2.1.2 Review of Documentation

The desk review involved a review of:

- Project documentation: VPA-DD and registered Passport /4/, Validation Report /5/, GS Boards' validation report, initial version of monitoring report /42/ and final version of monitoring report /43/.
- Relevant decisions, clarifications and guidance from the GS Board and the CDM Executive Board.
- The revised monitoring plan and the applied monitoring methodology, paying close attention to the measurement methods, and the quality assurance and quality control procedures.
- The data and information presented to verify their completeness, including the monitoring report and the measuring records of the different monitored parameters.
- The influence of data management and the quality assurance and quality control system on the generation and reporting of emission reductions.

A complete list of all documents reviewed is attached in chapter 6 of this report.

2.1.3 Site Visit

As the most essential part of the verification exercise, it is indispensable to carry out an inspection on site in order to verify that the project is implemented in accordance with the applicable criteria. Furthermore the on-site assessment is necessary to check the monitoring data with respect to accuracy to ensure the calculation of emission reductions. Changes to the key sustainable development indicators and the achievement and implementation of mitigation / compensation measures are other integral parts of the on-site assessment.

From 22/11/2017 to 24/11/2017 Alfonso Medrano visited the project in Uganda. The on-site visit included visits to the different areas of the project. Also, during the on-site visit the verification team was able to complete:

- An assessment of the implementation and operation of the project activity as per the PoA-DD, VPA-DD and the registered GS Passport.
- A review of information flows for generating, aggregating and reporting the monitoring parameters.

- A cross-check between information provided in the monitoring report and data from other sources such as logbooks, inventories, purchase records or similar data sources.
- A check of the monitoring practices against the requirements of the VPA-DD and the selected methodology.
- A review of calculations and assumptions made in determining the GHG data and emission reductions.
- Possibility of leakage was also checked
- The data aggregation trails were checked via spot sample down to the level of the recordings
- An identification of quality control and quality assurance procedures in place to prevent or identify and correct any errors or omissions in the reported monitoring parameters.
- Interviews with relevant personnel to confirm that the operational and data collection procedures are implemented in accordance with the monitoring plan and the registered VPA-DD. Representatives of the HIVOS, BSUL, and CLIMATE FOCUS including the operational staff of the project were interviewed. The main topics of the interviews are summarised.

Interviewed organization Person/Position	Interview topics
Hivos - Natasha Kalanda. Programme Officer	<ul style="list-style-type: none"> ✓ VPA presentation and design ✓ Baseline determination. ✓ Environmental Assessment. ✓ Stakeholder consultation ✓ PoA-VPA Management System ✓ VPA implementation ✓ Sampling plan ✓ BUS ✓ KPT ✓ Survey design & results

Interviewed organization Person/Position	Interview topics
<p>Climate Focus</p> <ul style="list-style-type: none"> - Hilda Galt. Carbon Consultant 	<ul style="list-style-type: none"> ✓ VPA presentation and design ✓ Baseline determination. ✓ Environmental Assessment. ✓ Stakeholder consultation ✓ PoA-VPA Management System ✓ VPA implementation ✓ Sampling plan ✓ BUS ✓ KPT
<p>Biogas Solutions Uganda Ltd.</p> <ul style="list-style-type: none"> - Michel Muvule. Program Coordinator - Peace Kansiime. PM ABPP/ 4B-F – Renewable Energy Advisor - Ruth Kuteesa. SNV- Advisor / MFIs/SACCOs - Grace Naluyirika. Finance Manager - Walter Okello. Quality, CSC, & Extension Manager - Florence Kintu. Business Development Manager - Barbara Kunihira. Monitoring, Evaluation and Contracts Manager 	<ul style="list-style-type: none"> ✓ Monitoring ✓ Data Management ✓ Biodigesters technical characteristics & installation

2.1.4 Findings

As an outcome of the verification process, the team can raise different types of findings according to the CDM Validation and Verification Standard.

Corrective Action Requests (CARs) are issued, where:

(a) Non-conformities with the monitoring plan or methodology are found in monitoring and reporting, or if the evidence provided to prove conformity is insufficient;

- (b) Mistakes have been made in applying assumptions, data or calculations of emission reductions which will impair the estimate of emission reductions;
- (c) Issues identified in a FAR during verification to be verified during verification have not been resolved by the project participants.

Clarification Requests (CLs) are issued if information is insufficient or not clear enough to determine whether the applicable CDM requirements have been met.

Forward Action Requests (FARs) are issued for actions if the monitoring and reporting require attention and/or adjustment for the next verification period.

The project participants were requested to address all verification findings and finally provided the verification team with sufficient evidence to determine that the applicable CDM requirements have been met. The project participant modified the initial monitoring report to resolve the verification team concerns and resubmitted a final version. AENOR has prepared this report based on the final monitoring report.

All the verification findings are summarized in section 3 below and documented in more detail in chapter 5 of this report.

2.1.5 Internal Quality Control

Following the completion of the assessment process by the verification team, all documentation undergoes an internal quality control through a technical review before the request for Issuance of ERs is submitted. The Technical reviewer is a qualified member of AENOR, independent from the team that carried out the verification of the project activity. The technical reviewer or the team appointed for the technical review is qualified in the technical area(s) and sectoral scope(s) of the project activity.

3 VERIFICATION FINDINGS

The summary of CAR, FAR and CL issued are shown in Table below:

	Verification topic	No. of CAR	No. of CL	No. of FAR
1	Project implementation			
2	Compliance with monitoring plan			
3	Compliance with monitoring methodology			
4	Monitoring Parameters		CL1, CL2	
5	Emission Reduction Calculations	CAR1, CAR2, CAR3		
6	Quality of Evidence to determine ER			
7	Management System and Quality Assurance			
	SUM	3	2	

3.1 Remaining issues, CARs, FARs from Previous Validation or Verification.

No CARs or FARs are remaining from the validation process

3.2 Post Registration Changes

No post registration changes are requested for this monitoring period.

3.3 Project Implementation

The registered VPA-DD and the monitoring report are available on the GS website.

The VPA was included in the PoA ABC on 19/04/2017 against the methodology "Technologies and practices to displace decentralized thermal energy consumption" version 1.0. /6/

Through the on-site visit and desk-review of documents provided by the PP, it has been verified that project implementation, equipment installation and the project boundary are in compliance with the registered VPA-DD.

The verification team reviewed whether the Monitoring Report and other supporting documents, such as the calculation spreadsheets and database were in accordance with the requirements of the GS. Also, the verification team reviewed the Monitoring Report was free of material misstatements and transparent, and it includes clear, complete and unequivocal information in accordance with the VPA-DD.

AENOR checked the evidence /7/8/9/10/11/12/13/14/ to prove that 6,312 units were built and commissioned in the period from 15/12/2009 to 31/08/2017 under the VPA. As per the below table:

Period	Number of biodigesters in VPA-003
15 December 2009 – 31 December 2009	2
1 January 2010 – 31 December 2010	329
1 January 2011 – 31 December 2011	1,034
1 January 2012 – 31 December 2012	996
1 January 2013 – 31 December 2013	1,629
1 January 2014 – 31 December 2014	848
1 January 2015 – 31 December 2015	636
1 January 2016 – 31 December 2016	561
1 January 2017 – 31 August 2017	277
Total	6,312

Verification team checked that 6,312 biodigesters were constructed before 31/08/2017 within the VPA project boundary.

In order to verify the accuracy of the biodigesters installed, the verification team studied the electronic database /7/ with the physical evidence, such as contract between the PP, masons, and owners, and the personal ID for each owner, no discrepancies were found during the assessment, and therefore the verification team can conclude that the total figure, characteristics, and distribution of the biodigester is in line with the registered VPA-DD.

3.4 Update on changes and incidents

No specific events occurred during the monitoring period that could be considered likely to affect the overall operation of the project.

3.5 Compliance of the monitoring plan with the monitoring methodology

The verification team reviewed whether the verified project activity was in accordance with the applied methodology and whether any other monitoring aspect of the project activity that is not specified in the methodology was established.

The monitoring methodology follows the Gold Standard Methodology: “Technologies and Practices to Displace Decentralised Thermal Energy Consumption” version 1.0.

The PP has followed the monitoring procedure stated in the applied methodology. The verification team could check during on site visit:

- Total Sales Record: The project proponent maintain an Accurate and complete total sales Record in paper backed up electronically including following data, as it was checked during on site visit:
 - Date of sale
 - Geographic area of sale
 - Model/type of Project technology sold
 - Quantity of project technologies sold
 - Name and telephone number (if available), and address
- Project Data Base: Derived from the total sales records.
- Monitoring Studies: The PP has developed monitoring studies for each project scenario in accordance with the guidelines of the methodology as it has detailed explained in following sections

The audit team has verified that BSUL has monitored all parameters considered in the approved VPA-DD.

During the on-site visit and desk review, the auditing team was able to review different records and found that the most important aspects of the monitoring methodology were adequately considered and documented. Therefore, the audit team considers that the monitoring plan is in compliance with the approved methodology applied by the GS project activity.

During the on-site visit, the audit team verified that:

- The implementation and operation of the project activity was as per the approved VPA-DD.
- The information provided in the monitoring report was in accordance with data from other sources such as logbooks, inventories, purchase records or similar data sources.
- The operational and data collection procedures are implemented in accordance with the monitoring plan and the VPA-DD.

The project was included under the PoA on 19/04/2017.

3.6 Compliance of monitoring with the monitoring plan

Regarding the compliance with the monitoring plan, the verification team confirmed that:

- The monitoring of reductions in GHG emissions to result from the proposed GS project activity was implemented in accordance with the monitoring plan contained in the VPA-DD.
- The monitoring plan and the applied methodology had been properly implemented and followed by the project participant.
- All parameters stated in the monitoring plan, the applied methodology and relevant GS decisions had been sufficiently monitored and updated.
- The responsibilities and authorities for monitoring and reporting were in accordance with the responsibilities and authorities stated in the monitoring plan.

Furthermore, the audit team reviewed the spreadsheet of emission reduction calculations and found that it follows the procedures stated in the approved VPA-DD and is in compliance with the monitoring plan.

3.6.1 Parameters fixed ex ante

AENOR verified that the parameters fixed ex ante stated in the registered PoA-DD and VPA-DD has been properly used in the emission reduction calculation. AENOR confirms that the following parameters have been applied:

Data/Parameter	$f_{NRB,y}$
Description	Fraction of biomass used in the absence of the project activity in year y that can be established as non-renewable biomass using nationally approved methods
Value applied	82.0%
Findings	No CARs/CLs/FARs raised in this parameter.
Conclusion	The value is consistent with the registered VPA-DD. The value was found consistent with the default country-specific f_{NRB} value approved by the Executive Board of the CDM /15/. The applied value is correct and justified.

Data/Parameter	$EF_{b, bio}$
Description	Emission factor of the woody biomass used in the baseline scenario b
Value applied	112
Findings	No CARs/CLs/FARs raised in this parameter.
Conclusion	The value is consistent with the registered VPA-DD. The value was found consistent with IPCC /16/. The applied value is correct and justified.

Data/Parameter	$EF_{p, bio}$
Description	Emission factor of the woody biomass used in the project scenario p
Value applied	112
Findings	No CARs/CLs/FARs raised in this parameter.
Conclusion	The value is consistent with the registered VPA-DD. The value was found consistent with IPCC /16/. The applied value is correct and justified.

Data/Parameter	$EF_{p, fuel}$
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Description	Emission factor of fossil fuels used in the project scenario
Value applied	Kerosene = 71.9 LPG = 63.1
Findings	No CARs/CLs/FARs raised in this parameter.
Conclusion	The values are consistent with the registered VPA-DD. The values were found consistent with IPCC /16/. The applied values are correct and justified.

Data/Parameter	NCV _{bio}
Description	Net calorific value of the non-renewable biomass used in the baseline scenario
Value applied	0.015
Findings	No CARs/CLs/FARs raised in this parameter.
Conclusion	The value is consistent with the registered VPA-DD. The value was found consistent with IPCC /16/. The applied value is correct and justified.

Data/Parameter	EF _{b, fuel}
Description	Emission factor of fossil fuels used in the baseline scenario b
Value applied	Kerosene = 71.9 LPG = 63.1
Findings	No CARs/CLs/FARs raised in this parameter.
Conclusion	The values are consistent with the registered VPA-DD. The values were found consistent with IPCC /16/. The applied values are correct and justified.

Data/Parameter	NCV _{fuel}
Description	Net calorific value of fossil fuels used in the baseline scenario
Value applied	Kerosene = 0.0438 LPG = 0.0473
Findings	No CARs/CLs/FARs raised in this parameter.
Conclusion	The values are consistent with the registered VPA-DD. The values were found consistent with IPCC /16/. The applied values are correct and justified.

Data/Parameter	VS _T	
Description	Daily volatile solid excreted from livestock category T	
Value applied	Animal T	Kg/head/day
	Dairy cow	1.90
	Goat	0.35
	Market swine	0.30
	Breeding swine	0.30
	Sheep	0.32
	Other cattle	1.50
	Poultry	0.02
Findings	<p>In the registered VPA-DD the number of category types was taken from the Ugandan Baseline Survey conducted in 2010 /44/ and the different kind of pigs were grouped under the "market swine" type. During UBP Survey 2017, pigs were divided into 2 categories: Market swine and Breeding swine so the PPs decided to include both pig categories to be considered into the parameters fixed ex-ante which is deemed reasonable and has no impact in the final ERs claimed, thus accepted by the verification team.</p> <p>No CARs/CLs/FARs raised in this parameter.</p>	
Conclusion	The values are consistent with the registered VPA-DD. The values were found consistent with IPCC /16/. The applied values are correct and justified.	

Data/Parameter	B _{OT}	
Description	Maximum methane producing capacity for manure produced by animal type T	
Value applied	Animal T	m ³ CH ₄ /kg
	Dairy cow	0.13
	Goat	0.13

	Market swine	0.29	
	Breeding swine	0.29	
	Sheep	0.13	
	Other cattle	0.10	
	Poultry	0.24	
Findings	<p>In the registered VPA-DD the number of category types was taken from the Ugandan Baseline Survey conducted in 2010 /44/ and the different kind of pigs were grouped under the "market swine" type. During UBP Survey 2017, pigs were divided into 2 categories: Market swine and Breeding swine so the PPs decided to include both pig categories to be considered into the parameters fixed ex-ante which is deemed reasonable and has no impact in the final ERs claimed, thus accepted by the verification team. In addition the PP detected a wrong value for Poultry in the registered VPA-DD of 0.36 m³ CH₄/kg when the right value according to IPCC was 0.24 m³ CH₄/kg, the PP update the value in the MR and the ER calculation spreadsheet resulting in lower ERs claimed which is conservative in the GS context hence accepted by the verification team of AENOR.</p> <p>No CARs/CLs/FARs raised in this parameter.</p>		
Conclusion	<p>The values were found consistent with IPCC /16/. The applied values are correct and justified.</p>		

Data/Parameter	$\eta_{\text{biogas stove}}$
Description	Combustion efficiency of the biogas stove introduced by the programme
Value applied	0.55
Findings	No CARs/CLs/FARs raised in this parameter.
Conclusion	The value is consistent with the registered VPA-DD. The applied value is correct and justified.

Data/Parameter	$MCF_{x,k}$
Description	Methane conversion factor for the animal waste handling system in the baseline situation by climate zone k (%)
Value applied	15.48%
Findings	The registered VPA-DD states that the $MCF_{x,k}$ value of 3.59% was taken from the Kenya Biogas User Survey conducted in 2014, and that manure handling methods for Uganda will be established prior to the

	<p>first verification.</p> <p>The PPs have carried out the UBP Manure Management Survey 2017 /17/ in order to establish the manure handling systems in the baseline situation for Uganda. AENOR verified that the information and figures stated in the UBP Manure Management Survey 2017 is consistent with the information reported in the MR and also in the ERs calculation spreadsheet. The UBP Manure Management Survey 2017 sample size is based on the requirements of monitoring methodology “Technologies and Practices to Displace Decentralised Thermal Energy Consumption” version 1.0, which means that at least 100 samples should be selected. In the case of the UBP Manure Management Survey 2017 the sample size is increased to 139. The verification team considers that this approach is appropriate and conservative and it ensures that the MCF value of 15.48% is representative for Uganda.</p> <p>No CARs/CLs/FARs raised in this parameter.</p>
Conclusion	The value is found consistent with IPCC /16/, UBP Manure Management Survey 2017 /17/ and ER calculation spreadsheet /20/. The applied value is correct and justified.

Data/Parameter	EF _{awms,T}																	
Description	Emission factor for the defined livestock population category T by average temperature (Uganda : 23.4 °C)																	
Value applied	<table border="1"> <thead> <tr> <th>Animal T</th> <th>m³ CH4/kg</th> </tr> </thead> <tbody> <tr> <td>Dairy cow</td> <td>0.0015</td> </tr> <tr> <td>Goat</td> <td>0.0000</td> </tr> <tr> <td>Other cattle</td> <td>0.0001</td> </tr> <tr> <td>Sheep</td> <td>0.0000</td> </tr> <tr> <td>Market swine</td> <td>0.0000</td> </tr> <tr> <td>Poultry</td> <td>0.0000</td> </tr> <tr> <td>Breeding swine</td> <td>0.0026</td> </tr> </tbody> </table>		Animal T	m ³ CH4/kg	Dairy cow	0.0015	Goat	0.0000	Other cattle	0.0001	Sheep	0.0000	Market swine	0.0000	Poultry	0.0000	Breeding swine	0.0026
Animal T	m ³ CH4/kg																	
Dairy cow	0.0015																	
Goat	0.0000																	
Other cattle	0.0001																	
Sheep	0.0000																	
Market swine	0.0000																	
Poultry	0.0000																	
Breeding swine	0.0026																	
Findings	<p>In the registered VPA-DD the number of category types was taken from the Ugandan Baseline Survey conducted in 2010 /44/ and the different kind of pigs were grouped under the “market swine” type. During UBP Survey 2017, pigs were divided into 2 categories: Market swine and Breeding swine so the PPs decided to include both pig categories to be considered into the parameters fixed ex-ante. In addition, the EF_{awms,T} for Breeding swine was calculated using the MCF_{x,k} value of 15.48% from MCF Manure Management Survey 2017 instead of the value of 3.59% of the registered VPA-DD, which is conservative (less ERs</p>																	

	claimed), thus accepted by the verification team. The corrective action request CAR 3 was closed. For details refer to the respective tables in Chapter 5 of this report.
Conclusion	The values were found consistent with IPCC /16/. The applied values are correct and justified.

Data/Parameter	PL
Description	Physical leakage of the biodigester
Value applied	10%
Findings	No CARs/CLs/FARs raised in this parameter.
Conclusion	The value is consistent with the registered VPA-DD. The applied value is correct and justified.

3.6.2 Parameters monitored

Accordingly, as the registered VPA-DD and GS Passport state, the parameters to be monitored in compliance with the applicable methodology are the following:

Parameter	Value applied	Verification approach						
<p>U_{p,y} Cumulative usage rate for technologies in project scenario p₁ in year y, based on cumulative adoption rate and drop-off rate (fraction)</p> <table border="1" data-bbox="520 1400 780 1585"> <tr> <td>2015</td> <td>81.51%</td> </tr> <tr> <td>2016</td> <td>79.81%</td> </tr> <tr> <td>2017</td> <td>79.10%</td> </tr> </table>	2015	81.51%	2016	79.81%	2017	79.10%		<p>AENOR verified that the UBP Survey A and B (Biogas User Survey) of the UPB Survey 2017 /18/ were carried out following the criteria stated in the Standard for Sampling and Survey for CDM Project Activities and Programme of Activities and also the guidance from the applied Gold Standard methodology. The sample size of the BUS was properly determined according to the CDM and GS rules. Furthermore AENOR, during the on-site visit and through documented evidence, verified that the survey was carried out by qualified and trained people.</p> <p>AENOR verified that the information and figures stated in the original questionnaires is consistent with the information reported in the UBP survey A and B result sheets /19/ and also in the ERs calculation spreadsheet.</p> <p>Therefore, it is AENOR opinion that the cumulative usage rate has been properly monitored according to the VPA-DD and the applied methodology.</p>
2015	81.51%							
2016	79.81%							
2017	79.10%							
<p>N_{p1,y} Cumulative number of project technology-days included in the</p>	4,902	<p>AENOR verified the information stated on the originals of the sales agreements signed by the householders against the electronic project database and no inconsistencies were</p>						

Parameter	Value applied	Verification approach
project database for project scenario p1 against baseline scenario b1 in year y		<p>detected, therefore, AENOR confirmed that the cumulative number of project technologies included in the project database is correct and consistent with the sales agreements signed by the householders.</p> <p>AENOR verified evidence provided to demonstrate that the calculation of parameter $O_{p1,y}$ is appropriate and conservative. Furthermore AENOR verified that the calculation of this parameter has been properly integrated in the ERs spreadsheet. No inconsistencies have been detected. Once both parameters ($N_{p1,y}$ and $O_{p1,y}$) were verified.</p> <p>AENOR confirmed that the formula applied to calculate parameter $N_{p1,y}$ was properly applied in the ERs spreadsheet. AENOR has raised CAR1 asking for the traceability of the calculation of the parameter in the ERs spreadsheet. Once the ERs spreadsheet was corrected, AENOR verified that the calculation of parameter $N_{p1,y} = N_{op1,y} * (O_{p1,y}/365)$ is correct and conservative.</p>
$N_{op1,y}$ Cumulative number of project technologies included in the project database for project scenario p_1 in year y	6,312	<p>AENOR verified the information stated on the originals of the sales agreements signed by the householders against the electronic project database and no inconsistencies were found.</p> <p>AENOR confirms that the cumulative number of project technologies included in the project database is correct and consistent with the sales agreements signed by the householders.</p>
$O_{p1,y}$ The average technology-days during which the biodigesters are operational for project scenario p_1 against baseline scenario b1 in year y	283.48	<p>AENOR verified through UBP Survey A and B that the number of units malfunctioning during the period was 46.</p> <p>AENOR verified that the non-operational days for a biodigester when it breaks down amounts to 246 days.</p> <p>AENOR verified that the value of parameter $N_{op1,y}$ is accurate through assessing the project data base and the sales agreements signed by householders.</p> <p>Finally AENOR verified that the formula used to calculate parameter $O_{p1,y}$ was correct and was correctly integrated in the ERs calculation spreadsheet.</p> <p>AENOR confirms that the value applied to parameter $O_{p1,y} = 283.48$ is correct according to the evidence verified.</p>
$LE_{p1,y}$ Leakage in project scenario	0	<p>AENOR verified that the baseline technologies are not reused outside the project boundary. Traditional firewood stoves cannot be moved</p>

Parameter	Value applied	Verification approach																
		<p>as they are fixed to the floor of the kitchenette.</p> <p>AENOR could verify that most household rely on wood and charcoal in Uganda. The small share of household that use a lower emitting energy source, such as LPG, will not switch back to NRB due to the project activity.</p> <p>The baseline is not fixed in this project, and the combustion of biogas always leads to lower emissions compared to all baseline fuels as it is 100% renewable.</p> <p>AENOR verified that physical leakage emissions and Emissions from biogas slurry have been considered as project emissions.</p>																
<p>N_{T,h} Number of animals of livestock category T in premise h</p>	<table border="1"> <thead> <tr> <th>Animal T</th> <th>Average Amount</th> </tr> </thead> <tbody> <tr> <td>Dairy cow</td> <td>3.37</td> </tr> <tr> <td>Other cattle</td> <td>4.56</td> </tr> <tr> <td>Market swine</td> <td>0.90</td> </tr> <tr> <td>Breeding swine</td> <td>1.32</td> </tr> <tr> <td>Poultry</td> <td>14.29</td> </tr> <tr> <td>Goat</td> <td>3.41</td> </tr> <tr> <td>Sheep</td> <td>0.47</td> </tr> </tbody> </table>	Animal T	Average Amount	Dairy cow	3.37	Other cattle	4.56	Market swine	0.90	Breeding swine	1.32	Poultry	14.29	Goat	3.41	Sheep	0.47	<p>During the on site visit, AENOR visited 22 households included in the UBP Survey A and B in order to verify that the survey was properly done. All the householders interviewed by AENOR confirmed that the survey was done, and AENOR verified that the responses were consistent with the ones included in the original questionnaires of the UBP Survey A and B.</p> <p>AENOR verified the original questionnaires from the UBP Survey A and B and compared their figures with the ones included in the UBP survey A and B result sheets /19/ and also against the figures included in the ERs calculation. No inconsistencies were found.</p> <p>AENOR confirms that the Number of livestock category T in premise used in the ERs calculation is accurate.</p>
Animal T	Average Amount																	
Dairy cow	3.37																	
Other cattle	4.56																	
Market swine	0.90																	
Breeding swine	1.32																	
Poultry	14.29																	
Goat	3.41																	
Sheep	0.47																	
<p>BB_{b1,bio} Amount of woody biomass used in the baseline scenario b1</p>	3.527	<p>AENOR verified the original questionnaires from the Survey C (KPT) /34/35/36/37/ included in the UBP Survey 2017 /18/ and compared their figures with the ones included in the KPT electronic databases /38/39/40/41/ and also against the figures included in the ERs calculation. No inconsistencies were found.</p> <p>AENOR verified also that the sample size for the KPT was properly defined following the 90/30 rule of the applied methodology and was conducted by trained people from Eco-Frontier.</p> <p>AENOR confirms that the KPT was designed according to the applied methodology and the results included in the ERs calculations are consistent with the original data reported in the field survey.</p>																
<p>BB_{b2,bio} Amount of woody biomass used in the baseline scenario b2</p>	7.042																	
<p>BB_{b3,bio} Amount of woody biomass used in the baseline scenario b3</p>	10.034																	
<p>BB_{b1,2,3,fuel} Amount of fossil fuel used in the baseline scenarios b1, b2 and b3</p>	0																	
<p>BB_{p1, bio} Amount of</p>	2.72																	

Parameter	Value applied	Verification approach																
woody biomass used in the project scenario p1.																		
BB_{p1,fuel} Amount of fossil fuels used in the project scenario p1	Kerosene = 0 LPG = 0																	
BB_b ratio Baseline scenario ratios	<table border="1" data-bbox="518 510 810 907"> <thead> <tr> <th>Baseline fuel use</th> <th>%</th> </tr> </thead> <tbody> <tr> <td>Firewood</td> <td>71.2</td> </tr> <tr> <td>Charcoal</td> <td>4.3</td> </tr> <tr> <td>Firewood and Charcoal</td> <td>20.1</td> </tr> <tr> <td>Other</td> <td>4.3</td> </tr> </tbody> </table>	Baseline fuel use	%	Firewood	71.2	Charcoal	4.3	Firewood and Charcoal	20.1	Other	4.3	<p>During the on-site visit, AENOR visited 22 households included in the UBP Survey A and B in order to verify that the survey was properly done. All the householders interviewed by AENOR confirmed that the survey was done, and AENOR verified that the responses were consistent with the ones included in the original questionnaires of the UBP Survey A and B.</p> <p>AENOR verified through the evidence the UBP survey A and B result sheets /19/ that the Baseline scenario ratios used in the ERs calculation are accurate and consistent with the BUS.</p>						
Baseline fuel use	%																	
Firewood	71.2																	
Charcoal	4.3																	
Firewood and Charcoal	20.1																	
Other	4.3																	
MS_{p,s,k} Fraction of livestock category T's manure not fed into the bio-digester, in climate region k	<table border="1" data-bbox="518 1093 810 1731"> <thead> <tr> <th>Animal T</th> <th>Average Amount</th> </tr> </thead> <tbody> <tr> <td>Dairy cow</td> <td>8.9%</td> </tr> <tr> <td>Other cattle</td> <td>20.3%</td> </tr> <tr> <td>Market swine</td> <td>62.9%</td> </tr> <tr> <td>Breeding swine</td> <td>90%</td> </tr> <tr> <td>Poultry</td> <td>100%</td> </tr> <tr> <td>Sheep</td> <td>100%</td> </tr> <tr> <td>Goat</td> <td>97.3%</td> </tr> </tbody> </table>	Animal T	Average Amount	Dairy cow	8.9%	Other cattle	20.3%	Market swine	62.9%	Breeding swine	90%	Poultry	100%	Sheep	100%	Goat	97.3%	<p>During the on site visit, AENOR visited 22 households included in the UBP Survey A and B in order to verify that the survey was properly done. All the householders interviewed by AENOR confirmed that the survey was done, and AENOR verified that the responses were consistent with the ones included in the original questionnaires of the UBP Survey A and B.</p> <p>AENOR verified the original questionnaires from the UBP Survey A and B and compared their figures with the ones included in the UBP survey A and B result sheets /19/ and also against the figures included in the ERs calculation. No inconsistencies were found.</p> <p>AENOR confirms that the values of MS_{p,s,k} and MS_{T,s,k} used in the ERs calculation are accurate.</p>
Animal T	Average Amount																	
Dairy cow	8.9%																	
Other cattle	20.3%																	
Market swine	62.9%																	
Breeding swine	90%																	
Poultry	100%																	
Sheep	100%																	
Goat	97.3%																	
MS_{T,s,k} Fraction of livestock category T's manure fed into the bio-digester, S in climate region k	<table border="1" data-bbox="518 1933 810 2016"> <thead> <tr> <th>Animal T</th> <th>Average Amount</th> </tr> </thead> <tbody> </tbody> </table>	Animal T	Average Amount															
Animal T	Average Amount																	

Parameter	Value applied		Verification approach								
	Dairy cow	91.1%									
	Other cattle	79.7%									
	Market swine	37.1%									
	Breeding swine	10%									
	Poultry	0%									
	Sheep	0%									
	Goat	2.7%									
GWP_{CH4} Global Warming Potential of methane	25		AENOR verified that the value for GWP _{CH4} = 25 (IPCC and VPA-DD) has been properly included in the ERs calculation. No inconsistencies have been detected.								
Bio Use of bio-slurry	<table border="1"> <thead> <tr> <th data-bbox="515 1104 679 1193">Type of use</th> <th data-bbox="679 1104 813 1193">Fraction</th> </tr> </thead> <tbody> <tr> <td data-bbox="515 1193 679 1283">Daily spread</td> <td data-bbox="679 1193 813 1283">46.5%</td> </tr> <tr> <td data-bbox="515 1283 679 1373">Liquid slurry</td> <td data-bbox="679 1283 813 1373">48.1%</td> </tr> <tr> <td data-bbox="515 1373 679 1462">Uncovered lagoon</td> <td data-bbox="679 1373 813 1462">5.4%</td> </tr> </tbody> </table>	Type of use	Fraction	Daily spread	46.5%	Liquid slurry	48.1%	Uncovered lagoon	5.4%		<p>AENOR verified the original questionnaires from the UBP Survey A and B of the UBP Survey 2017 /18/ and compared their figures with the ones included in the UBP survey A and B result sheets /19/ and also against the figures included in the ERs calculation. No inconsistencies were found.</p> <p>Furthermore AENOR visited 22 households included in the UBP Survey A and B in order to verify that the survey was properly done. All the householders interviewed by AENOR confirmed that the survey was done, and AENOR verified that the responses were consistent with the ones included in the original questionnaires of the UBP Survey A and B.</p>
Type of use	Fraction										
Daily spread	46.5%										
Liquid slurry	48.1%										
Uncovered lagoon	5.4%										

These parameters for achieving emission reduction calculation by the prescribed equations for baseline emissions, project emissions, and leakage and emissions reduction have been listed in the Monitoring Report in a complete manner.

The audit team verified the information flow (from data generation, aggregation, to recording, calculation and reporting) for these parameters including the values in the monitoring reports).

3.6.3 Safeguard principles

The next table summarizes the outcome of the 'Do no Harm' Assessment in the Gold Standard Passport, and lists the safeguard principles for which a mitigation principles has been identified.

AENOR verified that the safeguard principles identified by the Gold Standard are relevant for all projects, however for this project no mitigation measures are to be monitored according to the GS Passport registered for this VPA /4/.

Safeguarding principles	Application of mitigation measure
1. The project respects internationally proclaimed human rights including dignity, cultural property and uniqueness of indigenous people. The project is not complicit in Human Rights abuses.	Not required
2. The project does not involve and is not complicit in involuntary resettlement.	Not required
3. The project does not involve and is not complicit in the alteration, damage or removal of any critical cultural heritage	Not required
4. The project respects the employees' freedom of association and their right to collective bargaining and is not complicit in restrictions of these freedoms and rights	Not required
5. The project does not involve and is not complicit in any form of forced or compulsory labour	Not required
6. The project does not employ and is not complicit in any form of child labour	Not required
7. The project does not involve and is not complicit in any form of discrimination based on gender, race, religion, sexual orientation or any other basis.	Not required
8. The project provides workers with a safe and healthy work environment and is not complicit in exposing workers to unsafe or unhealthy work environments.	Not required
9. The project takes a precautionary approach in regard to environmental challenges and is not complicit in practices contrary to the precautionary principle.	Not required
10. The project does not involve and is not complicit in significant conversion or degradation of critical natural habitats, including those that are (a) legally protected, (b) officially proposed for protection, (c) identified by authoritative sources for their high conservation value, or (d) recognized as protected by traditional local communities.	Not required
11. The project does not involve and is not complicit in corruption.	Not required

3.6.4 SD Monitoring Parameters

AENOR verified that all the parameters related to social and sustainability have been listed in the Monitoring Report in a complete manner. The following table summarizes the way in which every parameter was verified:

Parameter	Value applied	Verification approach								
<p>GS-01 Air quality Perceived improvement in health by the user. (incidence of eye problems and respiratory illness)</p>	<table border="1" data-bbox="523 591 879 712"> <thead> <tr> <th>Incidence</th> <th>%</th> </tr> </thead> <tbody> <tr> <td>Reduced</td> <td>91.4</td> </tr> <tr> <td>Not changed</td> <td>8.6</td> </tr> <tr> <td>Worsened</td> <td>0.0</td> </tr> </tbody> </table>	Incidence	%	Reduced	91.4	Not changed	8.6	Worsened	0.0	<p>AENOR verified the original questionnaires from the UBP Survey A and B and compared their figures with the ones included in the UBP Survey A and B electronic database.</p> <p>Furthermore AENOR visited 22 households included in the UBP Survey A and B in order to verify that the survey was properly done. All the householders interviewed by AENOR confirmed that the survey was done, and AENOR verified that most of the householders affirmed that they have perceived an improvement in their health.</p>
Incidence	%									
Reduced	91.4									
Not changed	8.6									
Worsened	0.0									
<p>GS-02 Soil condition Percentage of biogas users who use slurry as a fertiliser</p>	93.5%	<p>AENOR verified the original questionnaires from the UBP Survey A and B and compared their figures with the ones included in the UBP Survey A and B electronic database.</p> <p>Furthermore AENOR visited 22 households included in the UBP Survey A and B in order to verify that the survey was properly done. All the householders interviewed by AENOR confirmed that the survey was done, and AENOR verified that the vast majority of householders affirmed that the soil conditions after the use of slurry are much better, and the production of the gardens has increased.</p>								
<p>GS-03 Quality of employment Number of employees attending training programmes</p>	72	<p>AENOR verified the following evidence in order to certify the quality of employment:</p> <ul style="list-style-type: none"> • BSUL Mason Training Certificate /21/ • BSUL Mason Training Report 1 /22/ • BSUL Mason Training Report 2 /23/ • BSUL Training Itinerary - East African Biogas Summit Arusha Nov 2016 /24/ • BSUL Training Report - East African Biogas Summit Arusha 								

Parameter	Value applied	Verification approach								
		<p>Report Nov 2016 /25/</p> <ul style="list-style-type: none"> • BSUL Masons Training Record /26/ • BSUL Mason Training Site Permit /27/ • Officers certificates /28/ • BSUL Employees and Employee Training /29/ <p>Besides, during the on site visit AENOR could meet and interviewed masons in order to verify that they had attended the trainings and they had been involved in the biodigesters construction. AENOR confirms that the masons were perfectly trained.</p>								
<p>GS-04 Livelihood of the poor Percentage of users reporting changes in expenditure on fuel for cooking</p>	<table border="1" data-bbox="523 981 874 1126"> <thead> <tr> <th data-bbox="523 981 715 1014">Expenditures</th> <th data-bbox="715 981 874 1014">%</th> </tr> </thead> <tbody> <tr> <td data-bbox="523 1014 715 1048">Increased</td> <td data-bbox="715 1014 874 1048">0.0</td> </tr> <tr> <td data-bbox="523 1048 715 1081">Stayed the same</td> <td data-bbox="715 1048 874 1081">6.5</td> </tr> <tr> <td data-bbox="523 1081 715 1115">Decreased</td> <td data-bbox="715 1081 874 1115">93.5</td> </tr> </tbody> </table>	Expenditures	%	Increased	0.0	Stayed the same	6.5	Decreased	93.5	<p>AENOR verified that the results of the respective monitoring parameter have been added to the Monitoring Report. Those results were collected through the UBP Survey A and B and compared their figures with the ones included in the UBP Survey A and B electronic database. Furthermore AENOR visited 22 households included in the UBP Survey A and B in order to verify that the survey was properly done. All the householders interviewed by AENOR confirmed that the survey was done, and AENOR verified that most of the householders affirmed that they have perceived a decrease in fuel expenditure.</p>
Expenditures	%									
Increased	0.0									
Stayed the same	6.5									
Decreased	93.5									
<p>GS-05 Access to affordable and clean energy services Number of biogas units installed</p>	<p>6,312 biogas units installed</p>	<p>AENOR verified the information stated on the originals of the sales agreements signed by the householders against the electronic project database. AENOR crosschecked it against the original sales agreements signed by the householders and no inconsistencies were found.</p> <p>AENOR confirms that the cumulative number of project technologies included in the project database is correct and consistent with the sales agreements signed by the householders.</p>								
<p>GS-06 Quantitative employment and income generation Number of employees in the project</p>	<p>10</p>	<p>AENOR verified through the evidence BSUL Employees and Employee Training /29/, BSUL Staff contracts 1 /30/ and BSUL Staff contracts 2 /31/ that there are 10 staff employed directly for BSUL. In addition, the biogas construction enterprises are employing masons to build the bio digesters, but these jobs</p>								

Parameter	Value applied	Verification approach
		are considered occasional and therefore the PP does not keep a detailed employment record of them.
GS-07 Technology transfer and technological self-reliance Number of employees attending training programmes	7	<p>As stated above, the value applied only refers to BSUL staff. AENOR has verified that this parameter has been correctly monitored through the following evidence:</p> <ul style="list-style-type: none"> • Taro training presentation /32/ • BSUL Mason Training Report 1 /22/ • BSUL Mason Training Report 2 /23/ • BSUL Training Itinerary - East African Biogas Summit Arusha Nov 2016 /25/ • BSUL Training Report - East African Biogas Summit Arusha Report Nov 2016 /26/ • BSUL Masons Training Record /27/ • BSUL Employees and Employee Training /29/ <p>Although masons are not considered in the value of this parameter, during the on site visit AENOR could meet and interviewed masons and BSUL staff in order to verify that they had attended the trainings and they had been involved in the biodigesters construction. AENOR confirms that the masons and BSUL staff were perfectly trained.</p>

In AENOR's opinion, the monitoring system and all applied procedures are in compliance with the monitoring plan contained in the approved VPA-DD, Passport and the applied methodology.

3.6.5 Implementation of sampling plan

A summary of the sampling plan implemented by the PP is included in the following table:

Item	UBP Survey 2017			
	Survey A	Survey B	Survey C	
			KPT (PFT)	KPT (BFT)
Target group	Households with a bio digesters commissioned between 1 st November 2009 and 31 st December 2016	Households with a bio digesters commissioned between 1 st November 2009 and 31 st December 2016	Users with a bio digesters	Households without a bio digesters
Main topics	User characteristics, fuel usage and SD survey	Usage rate	Project fuel use	Baseline fuel use
Sampling method	Cluster sampling based on age group of bio digesters	Cluster sampling based on age group of bio digesters	Cluster sampling based on age group of bio digesters	Cluster sampling based on location using PFT sampling frame
Cluster	Age group	Age group	Age group	Age group
Cluster size	Proportional to number of digesters constructed.	35	Proportional to number of digesters constructed.	Proportional to number of digesters constructed
Number of clusters	7	7	7	7
Precision level	N/A	N/A	90/30	
Total sample size	139	245	37	Firewood only : 46 Charcoal only: 40 Both charcoal and firewood: 43

The data for the calculation of emission reductions was obtained from survey questionnaires. The survey questionnaires were conducted by independent experienced consultancy firm called Eco-Frontier.

Eco Frontier carried out the survey "UBP survey 2017" /18/ across the 4 regions of Uganda which includes Central, Eastern, Northern and Western regions. The "UBP survey 2017" is composed of 3 different surveys:

- Two qualitative surveys, Survey A and Survey B, that were carried out in 139 and 245 households respectively that had installed biodigesters, and that were commissioned between 1st November 2009 and 31st December 2016.

Surveyed households were selected through both multi-stage cluster sampling and simple random sampling from project database.

- A Kitchen Performance Test (both PFT and BFT) called Survey C that was conducted in households with and without biodigesters respectively. The PFT was conducted in 37 households with biodigesters. The BFT consisted of three parts, i.e. BFT B1-households that use firewood only to meet more than 50% of their daily cooking needs (46 households), BFT B2- households using charcoal only (40 households) and BFT B3-households that use both firewood and charcoal (43 households).

Regarding the UBP Survey A and B, the PP over-sampled the surveyed households in order to account for missing values and non-responsiveness. The sample size is based on the requirements of monitoring methodology "Technologies and Practices to Displace Decentralised Thermal Energy Consumption" version 1.0, which means that at least 100 samples should be selected. In the case of the Survey A the sample size is increased to 139 households and 245 households for Survey B. The verification team considers that this approach is appropriate and conservative and it ensures that monitoring is representative of typical technology and fuel use practices.

All the questionnaires were inspected by the verification team in the PP office during the on-site verification. The verification team considers that the data is reliable and reasonable. Therefore the verification team considers that the uncertainty level of monitoring data is low.

AENOR verified that the BUS was carried out following the criteria stated in the Standard for Sampling and Survey for CDM Project Activities and Programme of Activities and also the guidance from the applied Gold Standard methodology.

The sample size of the UBP survey 2017 was properly determined according to the CDM and GS rules. Furthermore AENOR, during the on site visit and through documented evidence, verified that the survey was carried out by qualified and trained people from Eco-Frontier /33/45/.

AENOR verified that the information and figures stated in the original questionnaires is consistent with the information reported in the UBP survey 2017 spreadsheets /19/38/39/40/41/ and also in the ERs calculation spreadsheet /20/.

Regarding the KPT, the sampling plan was designed with a confidence interval of at least 90/30 according to GS methodology to ensure the households interviewed are representative. In addition, although the methodology recommended a minimum test period of 3 days, AENOR has verified that the GS confirmed that a one day testing period is possible as long as it is representative /46/. The KPT is a test designed for improved cook stoves. As these stoves typically only reduce 20% of fuel a longer test period is necessary. Biogas project on the other hand replace typically 90 to 100% of the baseline fuel and it is therefore much easier to measure savings in a shorter period. Furthermore, an identical approach has been used in the NBP in Cambodia (approved by the Gold Standard) and the Indonesia Domestic Biogas Programme (approved by the Gold Standard). The two programmes are very similar in design and impact, and therefore the one day testing period is therefore accepted by the verification team of AENOR.

The KPT targets two groups – PFT households and BFT households. In total 37 PFT households were selected randomly from the project database. Another 129 samples of non-biogas households that resided close to the biogas household were surveyed to establish the baseline KPT. Care was taken that these households were similar in nature (household size, number of cattle, similar socio-economic conditions) to their

neighbours with the biodigester. Each household had an equal chance of being surveyed within any given district.

AENOR assessed how the Outliers analysis was excluded through the Grubb's test. All data has been deemed consistent and passed the Grubb's test assessment

AENOR verified the original questionnaires from the KPT 2017 and compared their figures with the ones included in the KPT electronic database and also against the figures included in the ERs calculation. No inconsistencies were found.

AENOR verified also that the sample size for the KPT was properly defined following the 90/30 rule of the applied methodology and was conducted by trained people from Eco-Frontier /45/.

AENOR confirms that the KPT was designed according to the applied methodology and the results included in the ERs calculations are consistent with the original data reported in the field survey.

3.6.6 Sampling approaches during verification:

With reference to the Standard for sampling and surveys for CDM project activities and programme of activities, version 07.0 /47/, and the Sampling and surveys for CDM project activities and programme of activities version 04.0 /48/, the verification team justified to apply acceptance sampling for checking the PP's sample records of the monitoring parameters. The verification team specified in advance using own professional judgment next parameters to determine the sample size for the on-site check:

- AQL of 1%
- UQL of 20%
- Producer Risk of 5%
- Consumer Risk of 5%

Therefore, according to the sampling guidelines, 22 samples were required to be checked by the DOE and the acceptance number is 1, which means that number of discrepancies between DOE check and PP result must not exceed 1.

During the on-site visit, AENOR visited 22 households included in the UBP Survey A and B in order to verify that the survey was properly done, and also to verify that the biodigesters were properly installed. All the householders interviewed by AENOR confirmed that the survey was done, and AENOR verified that the responses were consistent with the ones included in the original questionnaires of the UBP Survey A and B.

Besides, AENOR verified the original questionnaires from the UBP Survey A and B and compared their figures with the ones included in the UBP Survey A and B electronic database and also against the figures included in the ERs calculation. No inconsistencies were found.

AENOR confirms that the figures included in the ER calculation spreadsheet, the UBP Survey A and B and the data base are consistent and match exactly those reported through the UBP Survey A and B survey forms.

There was no additional drop out in these 22 sampled users during the verification team's visit. From the verification team's sampling results, there is no discrepancy compared with PP's result and hence PP's records are accepted.

Furthermore some of the householders visited by AENOR were included also in the KPT Test. Although it is not possible to verify the results of the KPT test through an on-site visit, AENOR asked the householders in order to know if the KPT test was actually carried out. All the householders included in the KPT database who were interviewed confirmed that the tests were done in the dates indicated in the MR.

Thus, it is confirmed that the PP's records are acceptable and valid.

The list of the sampled users is detailed below:

User name	District	Village
Byakatonda Patrick	Wakiso	Katansi
Joseph Lubega	Kampala	Kabuusu
Kasura Allen	Kampala	Kyanja
Kihora Flavia	Wakiso	Gayaza
Edward Katumba	Wakiso	Gayaza
Fred Sebyggala	Wakiso	Gayaza
Charles Kyobe	Wakiso	Kayebe
Robert Herbert Kibuuka	Wakiso	Nabitalo
Moses Bagyendere	Wakiso	Kikoko
Mike Ssengoba	Wakiso	Ssenge
Dr. Hellena Mbuza	Wakiso	Kisimbiri
Taremwa Vincent	Wakiso	Napingwe
Ibrahim Nsubuga	Mukono	Seeta
Rev. Canon Paul Kigundu	Mukono	Nasuri
Kasajja Nakiwala Margaret	Mukono	Kigomba North
Winfred Nansubuga Lutu	Mukono	Nakisunga
Rose Walakira	Mukono	Upper Nabuti
Ssali Sam	General District	Buntaba
Nakitende Gorrette	Ssembaule	Kyolole
Amina Mugwanya	Mukono	Lutengo B
Muyira Edward	Mukono	Nama
Seruwagi Fred	Kayunga	Misana

A summary of the main topics discussed with the householders is included below:

Project information: All the householders affirmed that they were properly informed about all the matters related to the project and the PoA (technical characteristics, financial issues, carbon revenues, etc).

UBP Survey A and B: All the householders interviewed by AENOR confirmed that people from Eco-Frontier came to their houses and asked them questions related to the biodigester.

UBP Survey C- Kitchen Performance Test (KPT): Some of the householders interviewed by AENOR confirmed that people from the Eco-Frontier came to their houses to make some questions about their cooking practices and also to carry out a 24 hour test /46/ while we were cooking. They also confirmed that the fuel they used to cook was weighted.

Voluntary participation: All the householders confirmed they voluntary participation in the project.

Sales agreement: All the householders interviewed had and shown a copy of the sales agreement signed with BSUL.

Training in the use of the plant: All the householders affirmed that they were trained in the way to feed the biodigester, and also the way to work with the kitchen installed.

Benefits of the plant: All the householders said that their life had improved a lot since their biodigesters were installed. The main benefits reported were:

- Air quality at home
- No need to go to the forest to look for firewood.
- No need to buy firewood/charcoal/fuel. Money savings.
- Use of bioslurry in the garden.

Incidents/downtimes: Four householders interviewed had some problems with the plant installed. One contacted directly with the PP and the problems were. Two problems were related to leakage due to construction fails, another with a wrong mixing of feedstock and the last one with the steal of the stove by the mason.

Grievance mechanism: All the stakeholders were aware of the P.O. Box located at Kampala. Furthermore they also knew the telephone number to call to report any complaint.

General opinion: All the stakeholders interviewed affirmed that in general the biodigesters had helped and their standard of living and the quality of life have improved a lot thanks to the project.

AENOR could verify that all the bio digesters visited were working properly.

3.7 Double counting of emissions reductions

According to the procedures stated in the PoA-DD to assure that no double counting could happen, AENOR verified during the on-site visit and also through evidence that:

- The complete address of each biogas system has been properly recorded.
- All the biogas systems have unique serial numbers.
- BSUL has not included these biogas systems in a different VPA or carbon project.

AENOR verified evidence /49/ in which the PP confirms that no RECs have been issued for the current VPA.

Furthermore AENOR checked the following registries/platforms in order to verify that they do not hold RECs from this VPA:

- UNFCCC Clean Development Mechanism
- VERRA
- Environmental Market
- APX

Therefore, AENOR confirms that there is no evidence of a possible double counting of emissions reductions during the current monitoring period.

3.8 Grievance mechanism

According to the requirements of GS, AENOR verified that grievance mechanism is in place. Complaints are picked up by the Quality Control Manager, who then contacts the relevant Biogas Construction Enterprise (BCE) or Mason who constructed the biogas digester to address the issue at the client's premises. The Monitoring and Evaluation officer then follows up the progress of this intervention if there is any comments collected during the monitoring period. The complaints are recorded in the Complaints Tracker' tool by BSUL /50/.

3.9 Assessment of data and calculation of greenhouse gas emissions reductions

The audit team carried out a review of information flows for generating, aggregating and reporting the monitoring parameters to assess a completeness of monitoring in line with the registered monitoring plan and the applied methodology, including:

- The measurement/determination method used.
- Relevant monitoring equipment, their features and the control and calibration procedures.
- Significant inaccuracies occurring in case of measured or estimated values of some parameters.
- Measuring, reading and/or recording frequency.
- QA/QC procedures applied to prevent or identify and correct any errors or omissions in the reported monitoring parameters.

Monitoring of reductions in GHG emissions to result from the registered project have been implemented in accordance with the monitoring plan. The monitoring mechanism is effective and reliable. All applicable parameters stated in the monitoring plan, the applied methodology and relevant GS Board decisions have been sufficiently monitored.

AENOR has reproduced the calculation made by the PP in spreadsheets and the same results have been obtained. Therefore the calculation is deemed appropriate and consistent with the evidence provided and crosschecked by AENOR. Furthermore, appropriate methods and formulae for calculating baseline emissions, project emissions and leakage have been followed, and assumptions are correctly applied and justified.

During the verification of the project activity, AENOR assessed the necessary data to verify the emissions reductions claimed by the project participant for the monitoring period. The verification team checked the following evidence and information:

- Characteristics of biodigesters installed; after performing the on-site assessment, AENOR can confirm that these are in accordance with the technical characteristics included in the VPA-DD.
- Main project database
- UBP Survey A and B records
- UBP Survey C (KPT) records
- Emission reductions calculations

The final version of the monitoring report contains a comparison of the actual emission reductions claimed in the monitoring period with the estimate in the approved VPA-DD. The claimed emission reductions for this monitoring period are 38,103 tCO₂e compared with the estimated emission reductions of 15,705 tCO₂e in the VPA-DD. This increase was mainly due to the fact that the number of biodigesters installed was 30% higher than the estimated in the VPA-DD. In addition, the update in the MCF Manure Management Survey /17/showed that the MCF value was also higher than the one estimated when registering the VPA-DD, as well as the fraction of manure fed into the biodigester, thus increasing the ERs.

The vintage breakdown of Emission reductions verified is as follows:

Vintage (year)	Emission Reductions (tCO ₂ e)
2015	10,487
2016	16,188
2017	11,428
Total	38,103

In AENOR's opinion, during the monitoring period 19/04/2015 - 31/08/2017, the project was adequately implemented and it can be confirmed that technology, project equipment and monitoring and metering equipment have been implemented and operated in line with the approved VPA-DD.

In AENOR's opinion, the monitoring process carried out during the current period is deemed appropriate and consistent with the revised monitoring plan and the relevant guidance provided by the GS Board.

3.10 Quality of Evidence to Determine Emission Reductions

The verification team confirmed that:

- The reported emission reductions were supported by sufficient evidence and records, with the adequate frequency and covering the full monitoring period, in accordance with the requirements established in the monitoring plan and the approved monitoring methodology.
- The source and nature of the evidence was adequate, verifiable and correctly defined or identified.

In the desk review and during the on-site visit, the audit team cross-checked all information provided in the monitoring report and in the calculation spreadsheets against data from other sources such as log book, meeting minutes, independent third party records, technical documents, purchase records, and other similar data sources, and found that the quality of evidence and the data collection system used to determine emission reductions of the project activity were in accordance with the monitoring plan of the VPA-DD and the applied methodology.

The verification team checked the organization chart for the monitoring team of the project. Moreover, the monitoring was carried out in form of biogas user survey with questionnaires. The verification team checked the UBP Survey 2017 in form of questionnaires was conducted in February and May 2017. The surveyor, namely Eco-Frontier was selected by the PP since they are the independent technical experts with experience in agricultural knowledge and statistical survey. The selection of survey consultant was based on the tendering process, in order to ensure that the survey consultant is capable to conducting the survey questionnaires.

The survey tender and the contract between the survey consultant and PP are also reviewed by the verification team. The survey coordinator also conducted the specified training for the surveyors /33/45/. The training minutes and records for the surveyor were checked by the verification team, thus it can ensure that the trained personnel in the survey team have the knowledge about the regional customs, local farming practices, technical design of the biodigester system, amount and type of fuel used and the way for households to handle the animal waste. This complies with the requirements in the applied GS methodology.

3.11 Management System and Quality Assurance

During the on-site visit, the audit team was able to verify that monitoring systems and all applied procedures are in compliance with the monitoring plan and the approved methodology. The different QA/QC procedures established in the monitoring plan are applied.

After the audit team reviewed the evidence of the fulfilment of data collection and processing, data quality control system and daily recording provided by the project participant, it found that the worksheet applied in the spreadsheet for emission reduction calculation was in accordance with the QA/QC procedure of the monitoring plan.

All roles and positions are well defined and implemented. Qualified personnel are involved in the monitoring procedures (monitoring plan, job descriptions, and organisation chart). Moreover, training for new personnel involved in the monitoring procedures was held. All above statements were verified during the on-site visit and document review.

3.12 Hints for next periodic Verification

No FAR has been raised during this verification.

4 VERIFICATION AND CERTIFICATION STATEMENT

Reporting period: From 19/04/2015 - 31/08/2017

Verified emission reductions in the above reporting period:

Emission reductions: 38,103 tCO₂equivalent

AENOR has performed the verification of the emission reductions of the "African Biogas Carbon Programme (ABC) – Uganda– VPA003" for the period 19/04/2015 - 31/08/2017.

Our verification approach was based on the requirements as defined under the Kyoto Protocol, Marrakech accord, Montreal COP/MOP 1, Nairobi COP/MOP 2 as well as those defined by the Gold Standard Protocol.

We planned and performed our work to obtain the information and explanations that we considered necessary to provide sufficient evidence for us to give reasonable assurance that the amount of GHG emission reductions for the reporting period, prepared on the basis of both the monitoring plan included in the registered VPA-DD /2/ and the final monitoring report /43/, are fairly stated.

We conducted our verification having regard to the monitoring plan included in the VPA Design Document and the applied baseline as registered for the project. This assessment included:

- Collection of evidence supporting the reported data
- Checking whether the provisions of the monitoring plan, were consistently and appropriately applied.

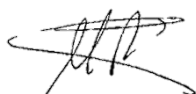
We have verified whether the information included in the final monitoring report is correct and that the emissions reductions achieved have been determined correctly.

In our opinion, GHG emissions reported for the project in the final monitoring report are fairly stated.

The GHG emission reductions were calculated correctly on the basis of the approved baseline and monitoring methodology "Technologies and Practices to Displace Decentralised Thermal Energy Consumption" version 1.0 and the monitoring plan and formulae provided in the registered VPA-DD.

AENOR is able to certify that the emission reductions from the "African Biogas Carbon Programme (ABC) – Uganda– VPA003" for the period 19/04/2015 - 31/08/2017 amount to **38,103 tCO₂** equivalent.

Madrid, 12th July 2018



Marcelino Pellitero Martínez
Team Leader



Irene Carrascón Iglesias
Authorized person

5 CLARIFICATION, CORRECTIVE ACTION REQUESTS AND FORWARD ACTION REQUEST

5.1 Remaining FARs from validation and/or previous verification

PROJECT ACTIVITY	African Biogas Carbon Programme (ABC) – Uganda - VPA003		
FINDING			
Classification	CAR <input type="checkbox"/>	CL <input type="checkbox"/>	FAR <input checked="" type="checkbox"/>
Description of finding <i>Describe the finding in unambiguous style; address the context (e.g. section)</i>	N/A		
PP RESPONSE #1 <i>It shall address the corrective action taken in details</i>	<i>This section shall be filled by the PP.</i>		
<i>It shall provide and identify the evidences proposed (if applicable)</i>	N/A		
DOE Assessment #1 <i>The assessment shall encompass all open issues. In case of non-closure additional corrective action and DOE assessments (#2, #3, etc.) shall be added</i>	N/A		
Conclusion <i>Tick the appropriate checkbox</i>	CAR/CL CLOSED <input type="checkbox"/>	To be checked during the periodic verification <input type="checkbox"/>	

5.2 CLs from this verification

PROJECT ACTIVITY	African Biogas Carbon Programme (ABC) – Uganda - VPA003		
FINDING	N° 1		
Classification	CAR <input type="checkbox"/>	CL <input checked="" type="checkbox"/>	FAR <input type="checkbox"/>
Description of finding <i>Describe the finding in unambiguous style; address the context (e.g. section)</i>	The document called CM-BUS-BSUL 2016 report prepared by Eco-Frontier Kenya Ltd shall be provided to the DOE team.		

PP RESPONSE #1	<i>This section shall be filled by the PP.</i>	
<i>It shall address the corrective action taken in details</i>	Kindly find attached the Monitoring Report outlining the sampling approach prepared by EcoFrontier. The name of the referenced file has also been corrected in the Monitoring Report.	
<i>It shall provide and identify the evidences proposed (if applicable)</i>	Carbon Monitoring and Biogas User Survey June 2017 (final report)	
DOE Assessment #1 <i>The assessment shall encompass all open issues. In case of non-closure additional corrective action and DOE assessments (#2, #3, etc.) shall be added</i>	The required document has been provided.	
Conclusion <i>Tick the appropriate checkbox</i>	CAR/CL CLOSED <input checked="" type="checkbox"/>	To be checked during the periodic verification. <input type="checkbox"/>

PROJECT ACTIVITY	African Biogas Carbon Programme (ABC) – Uganda - VPA003		
FINDING	Nº 2		
Classification	CAR <input type="checkbox"/>	CL <input checked="" type="checkbox"/>	FAR <input type="checkbox"/>
Description of finding <i>Describe the finding in unambiguous style; address the context (e.g. section)</i>	Evidence to demonstrate the number of employees in the project described in the MR shall be provided to the DOE Team (Parameter GS-06).		
PP RESPONSE #1	<i>This section shall be filled by the PP.</i>		
<i>It shall address the corrective action taken in details</i>	The Monitoring Report reports that there are 10 employees working for the implementing partner BSUL. These 10 employees are named and listed in the file 'BSUL Employees and Employee Training 20171012' (tab 'Employees'). This file was provided as part of the evidence package submitted when initiating the verification (but can be found again in the evidence documents package provided alongside this response round). In addition, the programme benefits from an extensive network of masons organized around Biogas Construction Enterprises. These are considered occasional workers, for which Hivos doesn't keep detailed employment records.		
<i>It shall provide and identify the evidences proposed (if applicable)</i>	BSUL Employees and Employee Training		
DOE Assessment #1 <i>The assessment shall encompass all open</i>	The required evidence has been provided.		

<i>issues. In case of non-closure additional corrective action and DOE assessments (#2, #3, etc.) shall be added</i>	
Conclusion <i>Tick the appropriate checkbox</i>	CAR/CL CLOSED <input checked="" type="checkbox"/> To be checked during the periodic verification <input type="checkbox"/>

5.3 CARs from this verification

PROJECT ACTIVITY	African Biogas Carbon Programme (ABC) – Uganda - VPA003		
FINDING	N° 1		
Classification	CAR <input checked="" type="checkbox"/>	CL <input type="checkbox"/>	FAR <input type="checkbox"/>
Description of finding <i>Describe the finding in unambiguous style; address the context (e.g. section)</i>	Calculation of parameter $N_{p1,y}$ is not traceable in the ERs spreadsheet.		
PP RESPONSE #1	<i>This section shall be filled by the PP.</i>		
<i>It shall address the corrective action taken in details</i>	The calculation of $N_{p1,y}$ has been added to the ER calculation spreadsheet, see tab entitled 'MCF & $N_{p1,y}$ '.		
<i>It shall provide and identify the evidences proposed (if applicable)</i>	ER calc UG VPA003		
DOE Assessment #1 <i>The assessment shall encompass all open issues. In case of non-closure additional corrective action and DOE assessments (#2, #3, etc.) shall be added</i>	PP updated the ER spreadsheet correctly and now the calculation of the parameter is fully traceable.		
Conclusion <i>Tick the appropriate checkbox</i>	CAR/CL CLOSED <input checked="" type="checkbox"/>	To be checked during the periodic verification <input type="checkbox"/>	

PROJECT ACTIVITY	African Biogas Carbon Programme (ABC) – Uganda - VPA003		
FINDING	N° 2		
Classification	CAR <input checked="" type="checkbox"/>	CL <input type="checkbox"/>	FAR <input type="checkbox"/>
Description of finding <i>Describe the finding in unambiguous style;</i>	The cumulative number of technologies included in the ERs spreadsheet is not in line with the		

<i>address the context (e.g. section)</i>	monitoring period. According to the first version of the MR, the monitoring period ends on 30/06/2017 and some biodigester plants commissioned after that date have been included to calculate the ERs.	
PP RESPONSE #1	<i>This section shall be filled by the PP.</i>	
<i>It shall address the corrective action taken in details</i>	It is the intention of the PP for the monitoring period to extend to 31 August 2017. The ER calculation spreadsheet and MR have been corrected to demonstrate this.	
<i>It shall provide and identify the evidences proposed (if applicable)</i>	ER calc UG VPA003 Uganda MR V 3.0	
DOE Assessment #1 <i>The assessment shall encompass all open issues. In case of non-closure additional corrective action and DOE assessments (#2, #3, etc.) shall be added</i>	PP updated the MR and ER spreadsheet correctly and appropriate evidence has been provided	
Conclusion <i>Tick the appropriate checkbox</i>	CAR/CL CLOSED <input checked="" type="checkbox"/>	To be checked during the periodic verification <input type="checkbox"/>

PROJECT ACTIVITY	African Biogas Carbon Programme (ABC) – Uganda - VPA003		
FINDING	N° 3		
Classification	CAR <input checked="" type="checkbox"/>	CL <input type="checkbox"/>	FAR <input type="checkbox"/>
Description of finding <i>Describe the finding in unambiguous style; address the context (e.g. section)</i>	There are some inconsistencies between the values applied for the fixed ex-ante parameter $EF_{awms,T}$ included in the ERs spreadsheet and the ones described in the Monitoring Report.		
PP RESPONSE #1	<i>This section shall be filled by the PP.</i>		
<i>It shall address the corrective action taken in details</i>	The fixed parameters established ex-ante have been corrected to apply in the ER spreadsheet and the Monitoring Report. The EF_{awms} value for breeding swine is missing from the registered VPA-DD, and is hence calculated in the ER sheet (tab 'PE', Cell D43).		
<i>It shall provide and identify the evidences proposed (if applicable)</i>	ER calc UG VPA003 Uganda MR V 3.0		
DOE Assessment #1 <i>The assessment shall encompass all open issues. In case of non-</i>	PP updated the MR and ER spreadsheet correctly and appropriate evidence has been provided.		

<i>closure additional corrective action and DOE assessments (#2, #3, etc.) shall be added</i>		
Conclusion <i>Tick the appropriate checkbox</i>	CAR/CL CLOSED <input checked="" type="checkbox"/>	To be checked during the periodic verification <input type="checkbox"/>

6 REFERENCES

Ref	Document Name	Author/Competent Authority
1	GS African Biogas Carbon Programme (ABC) PoA-DD	PP
2	GS " African Biogas Carbon Programme (ABC) – Uganda- VPA003" VPA-DD	PP
3	IE-DTC-039 - Validation, verification and certification of clean development mechanism (CDM) project activities.	AENOR
4	GS " African Biogas Carbon Programme (ABC) – Uganda- VPA003" Passport	PP
5	GS " African Biogas Carbon Programme (ABC) – Uganda- VPA003" Validation report	AENOR
6	Technologies and practices to displace decentralized thermal energy consumption version 1.0	GS
7	Uganda consolidated database	PP
8	Sales Agreement BSU 46	PP
9	Sales Agreement BSU 480	PP
10	Sales Agreement BSU 02132	PP
11	Sales Agreement BSU 3001	PP
12	Sales Agreement BSU 03053	PP
13	Sales Agreement BSU 04382	PP
14	Sales Agreement BSU1 03906	PP
15	Default country-specific fNRB value for Uganda	UNFCCC
16	2006 IPCC Guidelines for National Greenhouse Gas Inventories. Chapter 10, Volume 4	IPCC
17	UBP Manure Management Survey 2017	PP
18	Carbon Monitoring and Biogas User Survey June 2017 (final report)	Eco-Frontier
19	UBP Survey A and B results sheet-final+Analysis	Eco-Frontier
20	ER calculation Spreadsheet Uganda – VPA003	PP
21	BSUL Mason Training Certificate	PP
22	Mason Training Report 1	PP
23	Mason Training Report 2	PP
24	BSUL Mason Training Site Permit	PP

Ref	Document Name	Author/Competent Authority
25	BSUL Training Itinerary - East African Biogas Summit Arusha November 2016	PP
26	BSUL Training Report - East African Biogas Summit Arusha Report November 2016	PP
27	BSUL Masons Training Record	PP
28	Officers certificates	PP
29	BSUL Employees and Employee Training	PP
30	BSUL Staff contracts 1	PP
31	BSUL Staff contracts 2	PP
32	TARO Training Presentation	PP
33	Survey A and B training attendance lists. Appendix 11 of Carbon Monitoring and Biogas User Survey June 2017 (final report)	Eco-Frontier
34	UBP Survey C –BFT-B1 (firewood)	Eco-Frontier
35	UBP Survey C –BFT-B2 (charcoal)	Eco-Frontier
36	UBP Survey C –BFT-B3 (firewood and charcoal)	Eco-Frontier
37	UBP Survey C –PFT	Eco-Frontier
38	Survey C BFT-B1 spreadsheet	Eco-Frontier
39	Survey C BFT-B2 spreadsheet	Eco-Frontier
40	Survey C BFT-B3 spreadsheet	Eco-Frontier
41	Survey C PFT spreadsheet	Eco-Frontier
42	MR African Biogas Carbon Programme (ABC) – Uganda–VPA003, version 1	PP
43	MR African Biogas Carbon Programme (ABC) – Uganda–VPA003, version 03	PP
44	A Socio-Economic and Gender Baseline Survey for the Uganda Domestic Biogas Project 2010	Heifer Project International Programme
45	KPT training attendance lists. Appendix 10 of Carbon Monitoring and Biogas User Survey June 2017 (final report)	Eco-Frontier
46	24 hr KPT confirmation Uganda KPT 24 Hour	PP and GS

Ref	Document Name	Author/Competent Authority
47	Standard for Sampling and surveys for CDM project activities and programmes of activities version 7.0	UNFCCC
48	Guidelines for sampling and surveys for CDM project activities and programme of activities version 4.0	UNFCCC
49	Hivos REC declaration GS4236 Uganda	Hivos
50	Grievance Mechanism BSUL Complaint Tracker	PP