GS VERIFICATION AND CERTIFICATION REPORT

HIVOS NETHERLANDS

INDONESIA DOMESTIC BIOGAS PROGRAMME OF ACTIVITIES (IDBP) (ID 1172)

VPA-1 ID 1174 6TH MONITORING PERIOD CPI AND 1ST MONITORING PERIOD CPII

VPA-2 GS 5303 2ND MONITORING PERIOD CPI

Report No: 8003004685-MY-GSPVer 19/03 – 19/023 (VPA-1)
MY-GSPVer 19/04 – 19/024 (VPA-2)

Date: 30/09/2019

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Verification Report:	***Report No.***	***Rev. No.***	***Date of 1st issue:***	***Date of this rev.***
	MY-GSPVer 19/03 – 19/023 MY-GSPVer 19/04 – 19/024	1.2	12//07/2019	30//09/2019
Programme of Activities:	***Title:***		***GS Registration date:***	***GS No.:***
	Indonesia Domestic Biogas Programme of Activities (IDBP) (ID 1172)		31/05/2013	1174
			04/05/2017	5303
	VPA-1 (ID 1174) GS 1174		***Verification No.:***	
	VPA-2 (ID 5303) GS 5303		VPA-1 6th periodic verification CPI VPA-1 1st periodic verification CPII VPA-2 2nd periodic verification CPI	
			PoA Scale	
			☐ *Large Scale*	☒ *Small Scale*
	Duration of the PoA:		***From:***	***To:***
	28 years		01/06/2011	31/05/2039
	VPA #1 title:		***Inclusion date***	***GS No.:***
	VPA-1 Indonesia Domestic Biogas Programme of Activities (IDBP) (ID 1174)		31/05/2013	1174
	VPA-2 Indonesia Domestic Biogas Programme of Activities (IDBP) (ID 5303)		04/05/2017	5303
	Crediting period:		***From:***	***To:***
	VPA-1 ☒ *Renewable (7y)* ☐ *Fixed (10y)*		01/06/2011 01/06/2018	31/05/2018 31/05/2025
	VPA-2 ☒ *Renewable (7y)* ☐ *Fixed (10y)*		02/01/2017	01/01/2024
Project Participant(s):	***Client:***		***Coordinating/Managing Entity***	
	HIVOS Netherlands		HIVOS Netherlands	
	Non Annex 1 country:		***Annex 1 country:***	
	Indonesia		Netherlands	
	PP from non-Annex 1 country:		***PP from Annex 1 country:***	
	HIVOS Indonesia		HIVOS Netherlands	

VPA No.	***Monitoring period (MP):***			***Applied methodology/ies***		
	From:	***To:***	***No. of days:***	***Title:***	***Version No.:***	***Scope(s) / TA(s)***
1	01/01/2018	31/12/2018	365	Technologies and practices to displace decentralized thermal energy consumption	11/04/2011 for CP1, and 3.1 for CP2.	1, 3 & 13
2	01/01/2018	31/12/2018	365	Technologies and practices to displace decentralized thermal energy consumption	1.0	1, 3 & 13

Monitoring Report #1:			***Monitoring Report #2:***		
Draft version:	***Fin-al version:***	**VPA Batch**	***Draft version:***	***Final version:***	**VPA Batch**
20/02/2019 v 0.1	19/09/2019, v0.6	1	20/02/2019 v 0.1	30/09/2019, v0.6	2

Verification team / Technical Review and Final Approval:	***Verification Team:***	***Technical review:***	***Final approval:***
	Cheong, Chun Yuen (Robert) – TL/TE	Lubanga, David	Rami, Kunal

Key dates of verification:	***Publication of Work Plan :***	***PFR issued:***	***On-site (from):***	***On-site (to):***
	10/03/2019	20/04/2019	08/04/2019	11/04/2019

<table>
<tr><td>Summary of Verification opinion</td><td colspan="3">HIVOS Netherlands has commissioned the TÜV NORD JI/CDM Certification Program to carry out verification for ID1174 MPVI of CPI and MPI of CPII periodic verification and GS5303 MPII of CPI of the PoA: “”, with regard to the relevant requirements for GS project activities.

As a result of this verification, the verifier confirms that:

☒ all operations of the project are implemented and installed as planned and described in the validated project design document,

☒ the monitoring plan is in accordance with the applied approved GS methodology,

☒ the installed equipment essential for measuring parameters required for calculating emission reductions are calibrated appropriately,

☒ the monitoring system is in place and functional. The project has generated GHG emission reductions, and

☒ the GHG emission reductions are calculated without material misstatements in a conservative and appropriate manner.

☒ the project has contributed to sustainable development.

TÜV NORD JI/CDM CP herewith confirms that the project has achieved emission reductions in the above mentioned reporting period as listed below (verified amount).</td></tr>
<tr><td rowspan="4">Emission reductions: [tCO_2e]</td><td rowspan="4">VPA-1: 45,994
VPA-2: 5,273</td><td>As per draft MR #1:</td><td>As per VPA1-DD:</td></tr>
<tr><td>19,452 CPI
27,235 CPII</td><td>8,698 /a CPI
37.337 /a CPII</td></tr>
<tr><td>As per draft MR #2</td><td>As per VPA2-DD:</td></tr>
<tr><td>5,190</td><td>10,836 /a</td></tr>
<tr><td rowspan="2">Document information:</td><td colspan="2">Filename:</td><td>No. of pages:</td></tr>
<tr><td colspan="2">19-023 -024 IDBP VPA1 MR6 CPII MR 1 VPA2 MR2 FVerR</td><td>144</td></tr>
</table>

Abbreviations:

CA	**Corrective Action / Clarification Action**
CAR	**Corrective Action Request**
CDM	**Clean Development Mechanism**
CER	**Certified Emission Reduction**
CO_2	**Carbon dioxide**
CO_{2eq}	**Carbon dioxide equivalent**
CL	**Clarification Request**
VPA-DD	**Component Project Activity Design Document**
DVerR	**Draft Verification Report**
ER	**Emission Reduction**
FAR	**Forward Action Request**
GHG	**Greenhouse gas(es)**
MP	**Monitoring Plan**
MR	**Monitoring Report**
PA	**Project Activity**
PoA-DD	**Programme of Activities Design Document**
PP	**Project Participant**
QA/QC	**Quality Assurance / Quality Control**
UNFCCC	**United Nations Framework Convention on Climate Change**
VVS	**Validation and Verification Standard**

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1. INTRODUCTION

HIVOS Netherlands has commissioned the TÜV NORD JI/CDM Certification Program (CP) to carry out the 6th periodic verification of the Programme of Activities:

"INDONESIA DOMESTIC BIOGAS PROGRAMME OF ACTIVITIES (IDBP) (ID 1172)"

with regard to the relevant requirements for CDM project activities. The verifiers have reviewed the implementation of the monitoring plan(s) (MP) as described in the registered PoA-DD and VPA-DD and GS PoA Passport.

GHG data for this monitoring period was verified in detailed manner applying the set of requirements, audit practices and principles as required under the CDM Validation and Verification Standard/VVS/ of the UNFCCC and GS approved methodology.

Sustainable Development Indicators for this monitoring period were verified in detailed manner as required under the GS Toolkit/GST, GS requirements/GSR/, relevant GS Annexes, and the GS Validation and Verification Manual/GS-VVM/.

This report summarizes the findings and conclusions for GS registered VPA-1 MR6 CPI, MR1 CPII and VPA-2 MR2 CPI periodic verification.

1.1. Objective

The objective of the verification is the review and ex-post determination by an independent entity of the GHG emission reductions. It includes the verification of the:

- implementation and operation of the project activity as given in the VPA-DD,
- compliance with applied approved methodology and the provisions of the monitoring plan,
- data given in the monitoring report by checking the monitoring records, the emissions reduction calculation and supporting evidence,
- accuracy of the monitoring equipment,
- quality of evidence,
- significance of reporting risks and risks of material misstatements.

1.2. Scope

The verification of this registered project is based on the validated Programme of Activities design document/GSPoA-DD/, the validated Component Project Activity Design Document (VPA-DD), the GS PoA Passport, the monitoring report(s)/MR/, emission reduction calculation spread sheet /ER/, supporting documents made available to the verifier and information collected through performing interviews and during the on-site

assessment. Furthermore, publicly available information was considered as far as available and required.

The verification is carried out on the basis of the following requirements, applicable for this Programme of Activities:

- Article 12 of the Kyoto Protocol /KP/,
- guidelines for the implementation of Article 12 of the Kyoto Protocol as presented in the Marrakech Accords under decision 3/CMP.1 /MA/, and subsequent decisions made by the Executive Board and COP/MOP,
- other relevant rules, including the host country legislation,
- CDM Validation and Verification Standard /VVS/,
- GS Toolkit and Requirements versions 2.1 /GST//GSR/
- monitoring plan as given in the registered PoA-DD and VPA-DD(s) /GSPoA-DD/VPA1/VPA2/,
- Approved GS Methodology/GSM/

2. GHG PROJECT DESCRIPTION

2.1. Technical Project Description of the Programme of Activities

The technology implemented under the PoA is biodigesters to treat animal waste anaerobically to generate biogas for use as cooking fuel. The capacity of the biodigesters ranges from 4 m^3 to 12 m^3.

There are two types of biogas systems that will be initially introduced by this PoA.

- Fixed-dome biodigester: This model is constructed with bricks and stone masonry installed underground.
- Plastic bag biodigester: This model constitutes a plastic bio-digester composed of a large bag that is typically stored above-ground.

2.2. Technical Description of the Component Project Activities

The Programme of Activities consists in a total of 2 VPAs briefly described as following:

VPA-1:

The technology implemented under the VPA-1 are biodigesters of fixed dome type installed underground to treat animal waste anaerobically to generate biogas for use as cooking fuel.

The key parameters of the VPA-1 are given in Table 2-1.1:

Table 2-1.1: Technical data of the component project activity

Plant size	**4 m^3**	**6 m^3**	**8 m^3**	**10 m^3**	**12 m^3**
Manure requirements (kg/day)	32	48	64	80	96
Estimated biogas production (m^3/day)	0.8	1.6	2.4	3.2	4.2
Estimated firewood savings (kg/day)	2.8	5.6	8.4	11.2	14.7

VPA-2:

The technology implemented under the VPA-2 are biodigesters of fixed dome type installed underground to treat animal waste anaerobically to generate biogas for use as cooking fuel.

The key parameters of the VPA-2 are given in Table 2-1.2:

Table 2-2.2: Technical data of the component project activity

Plant size	**4 m^3**	**6 m^3**	**8 m^3**	**10 m^3**	**12 m^3**
Manure requirements (kg/day)	32	48	64	80	96

Estimated biogas production (m^3/day)	0.8	1.6	2.4	3.2	4.2
Estimated firewood savings (kg/day)	2.8	5.6	8.4	11.2	14.7

2.3. Project Location

The details of the VPA-1 and VPA-2 locations are given in Table 2-3:

Table 2-3: VPA(s) Location

VPA No.: 1	Project Location			
Host Country	Indonesia			
Region:	9 active provinces during the current monitoring period			
Project location address:	9 provinces during monitoring period			
Latitude / longitude of program provinces:	#	Province	Latitude	Longitude
	1	Lampung	5° 27' 0.0000" S	105° 16' 0.0120" E
	2	West Java	6° 54' 53.0784" S	107° 36' 35.3160" E
	3	Central Java	7° 47' 49.4448" S	110° 22' 13.9044" E
	4	East Java	7° 15' 1.6020" S	112° 46' 7.8420" E
	5	Bali	8° 24' 34.2648" S	115° 11' 20.1084" E
	6	Nusa Tenggara Barat	8° 39' 10.5602" S	117° 21' 41.9314" E
	7	Nusa Tenggara Timur	8° 39' 26.575" S	121° 4' 45.732" E
	8	Yogyakarta	7 ° 47 '49.4448' 'S	110 ° 22 '13.9044' E
	9	South Sulawesi	5° 8' 51.5940" S	119° 25' 57.8352" E

VPA No.: 2	Project Location			
Host Country	Indonesia			
Region:	9 active provinces during the current monitoring period			
Project location address:	9 provinces during monitoring period			
Latitude / longitude of program provinces:	#	Province	Latitude	Longitude
	1	Lampung	5° 27' 0.0000" S	105° 16' 0.0120" E
	2	West Java	6° 54' 53.0784" S	107° 36' 35.3160" E
	3	Central Java	7° 47' 49.4448" S	110° 22' 13.9044" E
	4	East Java	7° 15' 1.6020" S	112° 46' 7.8420" E
	5	Bali	8° 24' 34.2648" S	115° 11' 20.1084" E
	6	Nusa Tenggara Barat	8° 39' 10.5602" S	117° 21' 41.9314" E
	7	Nusa Tenggara Timur	8° 39' 26.575" S	121° 4' 45.732" E
	8	Yogyakarta	7 ° 47 '49.4448' 'S	110 ° 22 '13.9044' E
	9	South Sulawesi	5° 8' 51.5940" S	119° 25' 57.8352" E

2.4. Project Verification History

Essential events since the registration of the PoA-DD are presented in the following Table 2-4.

Table 2-4: Status of previous Monitoring Periods

VPA-1

#	Item	Time	Status
1	PoA-DD registration	31/05/2013	Registered
2.	Inclusion of VPA-1	31/05/2013	Registered
3	1st Monitoring period	01/06/2011 to 31/05/2013	Issued
4	2nd Monitoring period	01/06/2013 to 31/12/2014	Issued
5	3rd Monitoring period	01/01/2015 to 31/12/2015	Issued
6.	4th Monitoring Period	01/06/2016 to 31/12/2016	Issued
7	5th Monitoring Period	01/01/2017 to 31/12/2017	Issued
8	6th CPI and 1st CPII Monitoring Period	01/01/2018 to 31/12/2018	Request Issuance

VPA-2

#	Item	Time	Status
1.	Inclusion of VPA-2	04/05/2017	Date Registered
2	1st Monitoring Period	02/01/2017 to 31/12/2017	Issued
3	2nd Monitoring Period	01/01/2018 to 31/12/2018	Request Issuance

An overview of all Post Registration Changes is given in the following table.

Table 2-4: Overview Post Registration Changes

#	Changes on PoA-DD/VPA-DD	Applicable from – to / as of	MP	Type of post registration change [1)]	Description	Status[2)] / Date
	n.a.					

[1)] IVPAiPoA : Inclusion of component project activities in programme of activities
TDfrMP : Temporary deviation from registered monitoring plan
TDfMM : Temporary deviation from the monitoring methodology
CrVPADD : Corrections to the registered VPA-DD
PCfrMP : Permanent changes from registered Monitoring Plan
PCfMM : Permanent changes from Monitoring Methodology

#	Changes on PoA-DD/VPA-DD	Applicable from – to / as of	MP	Type of post registration change [1)]	Description	Status[2)] / Date

CoPD : Changes to the project design of a registered PoA, or generic or specific VPA

[2)] Approval (by Gold Standard) or Acceptance (by DOE)

3. METHODOLOGY AND VERIFICATION SEQUENCE

3.1. Verification Steps

The verification consisted of the following steps:

- Contract review
- Appointment of team members and technical reviewers
- A desk review of the carbon and SD Monitoring Reports/MR/ submitted by the client and additional supporting documents with the use of customised verification protocol /CPM/ according to the Validation and Verification Standards /VVS//GS-VVM/,
- Verification planning,
- On-Site assessment,
- Background investigation and follow-up interviews with personnel of the project developer and its contractors,
- Draft verification reporting
- Resolution of corrective actions (if any)
- Final verification reporting
- Technical review
- Final approval of the verification.

3.2. Contract review

To assure that

- the project falls within the scopes for which accreditation is held,
- the necessary competences to carry out the verification can be provided,
- Impartiality issues are clear and in line with the GS accreditation requirements

a contract review was carried out before the contract was signed.

3.3. Appointment of team members and technical reviewers

On the basis of a competence analysis and individual availabilities a verification team, consisting of one team leader was appointed.

The list of involved personnel, the tasks assigned and the qualification status are summarized in the Table 3-1 below.

Table 3-1: Involved Personnel

	Name	Company	Function [1]	Qualification Status [2]	Scheme competence [3]	Technical competence [4]	Verification competence [5]	Host country Competence	On-site visit
☒ Mr. ☐ Ms.	Cheong, Chun Yuen (Robert)	TN Malaysia	TL	SA	☒	3.1, 13.2	☒	☒	☒
☒ Mr. ☐ Ms.	Lubanga, David	-	TR[B]	SA	☒	13.2, 3.1	☒	☐	-
☒ Mr. ☐ Ms.	Rami, Kunal	TN CERT GmbH	TR/FA[B]	SA	☒	3.1, 13.2	☒	☐	-

[1] TL: Team Leader; TM: Team Member, TR: Technical review; OT: Observer-Team, OR: Observer-TR; FA: Final approval

[2] GHG Auditor Status: A: Assessor; LA: Lead Assessor; SA: Senior Assessor; T: Trainee; TE: Technical Expert

[3] GHG auditor status (at least Assessor)

[4] As per S01-MU03 or S01-VA070-A2 (such as 1.1, 1.2, …)

[5] In case of verification projects

[A] Team Member: GHG auditor (at least Assessor status), Technical Expert (incl. Host Country Expert or Verification Expert), not ETE

[B] No team member

All team members contributed to the review of documents, the assessment of the component project activities and to the preparation of this report under the leadership of the team leader.

Technical experts contributed to the assessment of special aspects of the project activity, e.g. technical or host country aspects.

Statements of competence for the above mentioned team members are enclosed in annex 2 of this report.

3.4. Verification Planning

In order to ensure a complete, transparent and timely execution of the verification task the team leader has planned the complete sequence of events necessary to arrive at a substantiated final verification opinion.

Various tools have been established in order to ensure an effective verification planning.

Risk analysis and detailed audit testing planning

For the identification of potential reporting risks and the necessary detailed audit testing procedures for residual risk areas table A-1 is used. The structure and content of this table is given in Table 3-2 below.

Table 3-2: Table A-1; Identification of verification risk areas

Table A-1: GHG calculation procedures and management control testing / Detailed audit testing of residual risk areas and random testing				
Identification of potential reporting risk	**Identification, assessment and testing of management controls**	**Areas of residual risks**	**Additional verification testing performed**	**Conclusions and Areas Requiring Improvement (including *Forward Action Requests*)**
The following potential risks were identified and divided and structured according to the possible areas of occurance.	*The potential risks of raw data generation have been identified in the course of the monitoring system implementation.* *The following measures were taken in order to minimize the corresponding risks.* *The following measures are implemented:*	*Despite the measures implemented in order to reduce the occurrence probability the following residual risks remain and have to be addressed in the course of every verification.*	*The additional verification testing performed is described. Testing may include:* - *Sample cross checking of manual transfers of data* - *Recalculation* - *Spreadsheet 'walk throughs' to check links and equations* - *Inspection of calibration and maintenance records for key equipment* - *Check sampling analysis results* *Discussions with process engineers who have detailed knowledge of process uncertainty/error bands.*	*Having investigated the residual risks, the conclusions should be noted here. Errors and uncertainties are highlighted.*

The completed table A-1 is enclosed in Annex 1 (table A-1) to this report.

Project specific periodic verification checklist

In order to ensure transparency and consideration of all relevant assessment criteria, a project specific verification protocol has been developed. The protocol shows, in a transparent manner, criteria and requirements, means and results of the verification. The verification protocol serves the following purposes:

- It organises, details and clarifies the requirements a GS project is expected to meet for verification

- It ensures a transparent verification process where the verifying DOE documents how a particular requirement has been proved and the result of the verification.

The basic structure of this project specific verification protocol for the periodic verification is described in Table 3-3.

Table 3-3: Table A-2; Structure of the project specific periodic verification checklist

Table A-2: Periodic verification checklist				
Checklist Item	***Reference***	***Verification Team Comments***	***Draft Conclusion***	***Final Conclusion***
The checklist items in Table A-2 are linked to the various require-ments the monitoring of the project should meet. The checklist is organised in various sections as per the requirements of the topic and the individual project activity. It further includes guidance for the verification team.	*Gives reference to the information source on which the assessment is based on.*	*The section is used to elaborate and discuss the checklist item in detail. It includes the assessment of the verification team and how the assessment was carried out. The reporting requirements of the VVS shall be covered in this section.*	*Assessment based on evidence provided if the criterion is fulfilled (OK), or a CAR, CL or FAR (see below) is raised. The assessment refers to the draft verifi-cation stage.*	*In case of a corrective action or a clarification the final assessment at the final verification stage is given.*

The periodic verification checklist (verification protocol) is the backbone of the complete verification starting from the desk review until final assessment. Detailed assessments and findings are discussed within this checklist and not necessarily repeated in the main text of this report.

The completed verification protocol is enclosed in Annex 1 (table A-2) to this report.

3.5. Desk review

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

- the last revision of the PoA-DD and VPA-DD including the monitoring plan/GSPoADD/VPA1DD/VPA2DD/,
- the last revision of the validation report/VAL/,
- documentation of previous verifications/VER/
- the monitoring report(s), including the claimed emission reductions for the project/MRVPA1/MRVPA2/,
- the emission reduction calculation spreadsheet/ERVAP1/ERVPA2/.

Other supporting documents, such as publicly available information on the GS / UNFCCC website and background information were also reviewed.

3.6. On-site assessment

As 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. The main tasks covered during the site visit include, but are not limited to:

- The monitoring data were checked completely.
- An assessment of the implementation and operation of the registered component project activity as per the registered VPA-DD or any approved revision thereof;
- A review of information flows for generating, aggregating and reporting the monitoring parameters;
- The data aggregation trails were checked via spot sample down to the level of the meter recordings.
- Interviews with relevant personnel to determine whether the operational and data collection procedures are implemented in accordance with the monitoring plan in the VPA-DD;
- 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 check of the monitoring equipment including calibration performance and observations of monitoring practices against the requirements of the PoA-DD, VPA-DD and the selected methodology and corresponding tool(s), where applicable;
- A review of calculations and assumptions made in determining the GHG data and emission reductions;
- A detailed review of the implementation and monitoring of all SD indicators as per the registered GS PoA Passport
- 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.

Before and during the on-site visit the verification team performed interviews with the project participants to confirm selected information and to resolve issues identified in the document review.

Representatives of HIVOS Indonesia, consultants and Yayasan Rumah Energi operational staff were interviewed. The main topics of the interviews are summarised in Table 3-4.

Table 3-4: Interviewed persons and interview topics

Interviewed Persons / Entities	Interview topics
1. Projects & Operations Personnel Hivos Indonesia Yayasan Rumah Energi - CPA Implementer Climate Focus – Carbon Consultant JRI – Survey Consultant	- General aspects of the project - Technical equipment and operation - Changes since validation / previous verification - Monitoring and measurement equipment - Remaining issues from validation / previous verification - Calibrations - Quality management system - Involved personnel and responsibilities - Training and practice of the operational personnel - Implementation of the monitoring plan - Monitoring data management - Usage Survey data - Kitchen Performance Test data - Data uncertainty and residual risks - GHG emission reduction calculation - Implementation of SD indicators - Contribution to Sustainable Development - Procedural aspects of the verification - Maintenance - Environmental aspects - SD Indicators monitoring - GS Registration and previous Issuance Review Comment

The list of interviewees is included in chapter 7.4.

3.7. Draft verification reporting

On the basis of the desk review, the on-site visit, follow-up interviews and further background investigation the verification protocol is completed. This protocol together with a general project and procedural description of the verification and a detailed list of the verification findings form the draft verification report. This report is sent to the client for resolution of raised CARs, CLs and FARs.

3.8. Resolution of CARs, CLs and FARs

Nonconformities raised during the verification can either be seen as a non-fulfilment of criteria ensuring the proper implementation of a project or where a risk to deliver high quality emission reductions is identified.

Corrective Action Requests (CARs) are issued, if:

- Non-conformities with the monitoring plan or methodology are found in monitoring and reporting, or if the evidence provided to prove conformity is insufficient;
- Mistakes have been made in applying assumptions, data or calculations of emission reductions which will impair the estimate of emission reductions;
- Issues identified in a FAR during validation or previous verifications requiring actions by the project participants to be verified during verification have not been resolved.

The verification team uses the term Clarification Request (CL), which is be issued if:

- information is insufficient or not clear enough to determine whether the applicable CDM requirements have been met.

Forward Action Requests (FAR) indicate essential risks for further periodic verifications. Forward Action Requests are issued, if:

- the monitoring and reporting require attention and / or adjustment for the next verification period.

For a detailed list of all CARs, CLs and FARs raised in the course of the verification pl. refer to chapter 4.

3.9. Final reporting

Upon successful closure of all raised CARs and CLs the final verification report including a positive verification opinion can be issued. In case not all essential issues could finally be resolved, a final report including a negative verification opinion is issued.

The final report summarizes the final assessments w.r.t. all applicable criteria.

3.10. Technical review

Before submission of the final verification report a technical review of the whole verification procedure is carried out. The technical reviewer is a competent GHG auditor being appointed for the scope this project falls under. The technical reviewer is not considered to be part of the verification team and thus not involved in the decision making process up to the technical review.

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

3.11. Final approval

After successful technical review an overall (esp. procedural) assessment of the complete verification will be carried out by a senior assessor located in the accredited premises of TÜV NORD.

After this step the request for issuance can be started.

4. VERIFICATION FINDINGS

In the following paragraphs the findings from the desk review of the monitoring report(s)/MRVPA1/MRVPA2/, the calculation spreadsheet/ERVPA1/ERVPA2/, PoA-DD/GSPoADD/, VPA-DD/VPA1DD/VPA2DD/, the Validation Report/VAL/ and other supporting documents, as well as from the on-site assessment and the interviews are summarised.

The summary of CAR, CL and FAR issued are shown in Table 4-1:

Table 4-1: Summary of CAR, CL and FAR

VPA-1

Verification Topics	No. of CAR	No. of CL	No. of FAR
Description of project activity (A): - Project characterises - Technical project description - Units disseminated and summary Of emission reductions GHG emission reductions - Summary of VERs claimed CPI MPVI and CPII MPI	3	0	0
Monitoring Activities (B) - Organisational setup of carbon and SD monitoring - Description of Human Resources - Survey Design - Biogas User Survey (US & CMS) - Survey Implementation - Baseline Fuel Test (BFT) and Project Performance Fuel Test (PFT) - KPT Survey, KPT Implementation	1	3	0
Results (C) - BUS survey results - Parameters monitored and not monitored - Emission reduction component 1 - Emission reduction component 2 - Baseline methane emissions - Project methane emissions - Leakage emissions - Emissions from Bio-slurry - Ex-post estimate of emission reductions - Justification for ER difference with PDD	12	1	0
Sustainability Monitoring (D)	0	0	0

Verification Topics	No. of CAR	No. of CL	No. of FAR
- Safeguarding principles - Sustainability Development Assessment			
Stakeholder Feedback (E)	0	0	0
Data Quality Control and Assurance (F)	0	0	0
Project Participants (G)	0	0	0
SUM	**16**	**4**	**0**

The following tables include all raised CARs, CLs and FARs and the assessments of the same by the verification team. For an in depth evaluation of all verification items it should be referred to the verification protocols (see Annex).

CL from this verification

CL ID	**B-1**	**Section no.**	**2.4**	**Date:**	**11/04/2019**
Description of CL					
MR version 0.1 Section 2.4, table 6, fNRB: Clarification for the value applied for period 01/01/2018 to 31/05/2018 and for period 01/06/2018 to 31/12/2018.					
Project participant response				**Date:**	15/04/2019
Two new footnotes have been added to table 6 of the MR to clarify that different fNRB values apply to CPI and CPII, respectively.					
Documentation provided by project participant					
☒	Changes in the MR	Section(s): 2.4		New version No.: 0.2	
☐	Changes in XLS	Worksheet(s):		New version No.:	
☐	Other:				
DOE assessment				**Date:**	
MR version 0.2 Section 2.4, table 6, fNRB: The value applied for period 01/01/2018 to 31/05/2018 is 64.80% and for period 01/06/2018 to 31/12/2018 is 58.36% with reference to footnotes 18 & 19.					
Conclusion *Tick the appropriate checkbox*	☐ Additional action should be taken (finding remains open) ☒ The finding is closed				

CL ID	**B-2**	**Section no.**	**2.4**	**Date:**	**11/04/2019**
Description of CL					
MR version 0.1, Section 2.4; 1. Clarification for the date of the BUS survey and Usage Survey design. 2. The date in BUS 2018 report is unclear when it was conducted? 3. Table 9 has year 9 and according to footnote 21, the first year of use (age 1) must have technologies that have been in use on average longer than 0.5 years. For technologies in the second year of use (age 8), the technologies have been in use on average at least 1.5 years, and so on. However, VPA-1 ends on 31/12/2017. Clarification how is 0.5 years is derived.					

Project participant response			**Date:**	15/04/2019
1. As per the response below, the BUS Survey was conducted in November 2018. This has been clarified or updated across the MR. 2. Please refer to Section 2.3 of the BUS report, where the following statement is included: "Field interviewing or data collection process for BUS Survey was conducted in November 2018." 3. Please see the explanation on p. 28 of the BUS report. Age groups 1 and 2 relate to VPA-2. To ensure the 0.5 years of operation for age group 1, the sampling targeted households that installed units prior to 31/06/2018. For age group 2, the sampling targeted households that installed units prior to 30/06/2017. And so on. Given the programme started implementation in 2009, this backward calculation results in 9 age groups (2 for VPA-2 and 7 for VPA-1).				
Documentation provided by project participant				
☒	Changes in the MR	Section(s): various	New version No.: 0.2	
☐	Changes in XLS	Worksheet(s):	New version No.:	
☐	Other:			
DOE assessment			**Date:**	30/04/2019
MR version 0.2, Section 2.4; 1. The date of the BUS survey and Usage Survey design updated as November 2018. 2. BUS 2018 is conducted on November 2018 as per report section 2.3. 3. The explanation above for age group 1 and 2 is for VPA-2 with the 1st year of use is up to 30/06/2017 that is not in VPA-1. Therefore, VPA-1 is from year 3 to year 9 is correct.				
Conclusion *Tick the appropriate checkbox*	☐ Additional action should be taken (finding remains open) ☒ The finding is closed			

CL ID	**B-3**	**Section no.**	**2.5**	**Date:**	**11/04/2019**
Description of CL					
MR version 0.1, Section 2.5, KPT Execution: Clarification on the period of the execution.					
Project participant response				**Date:**	15/04/2019
Please refer to the last sentence of the first paragraph of Section 2.5, which confirms that the KPT was executed in December 2017. Table 12 further specifies that the exact dates were between 14 December and 24 December 2017.					
Documentation provided by project participant					
☒	Changes in the MR	Section(s): 2.5	New version No.: 0.2		
☐	Changes in XLS	Worksheet(s):	New version No.:		
☐	Other:				
DOE assessment				**Date:**	30/04/2019
MR version 0.2, Section 2.5, KPT Execution: The period of KPT execution is on 14/12/2017 and 24/12/2017					
Conclusion *Tick the appropriate checkbox*	☐ Additional action should be taken (finding remains open) ☒ The finding is closed				

CL ID	**C-1**	**Section no.**	**3.1**	**Date:**	**11/04/2019**
Description of CL					

MR version 0.1 Section 3.1:

1. Tables 15 and 16: PP is requested to clarify why year 1 and 2 is not included in the survey.
2. Operational Rate: Clarification on how the value 1,271 is derived?

Project participant response	**Date:**	15/04/2019

1. In tables 15 and 16 years 1 and 2 are excluded, as these relate to units installed in 2017 and 2018 (one and two years of usage) and therefore fall within the VPA2, and not this VPA1. VPA1 only covers the age groups 9 to 3.
2. The operational rate of 1,271 refers to the units that reported temporary malfunction. As per the year 2018, this amounted to 1,271 units – see the updated reference to: "20190211_IDBP_Database_VPA1" sheet "Non-functioning" cell H2899.

   Please note that while the CPI calculation sheet used this correct figure, the CPII calculation sheet referred to the old 54 number. Cell E85 of sheet "GS VER 2019 (CPII)" has therefore been updated to reflect this correct number.

   Also note that the above does not impact the remainder of the ER calculation, as the calculation presented in cells DF12 to DQ12 of the "cumulative VER" sheet already was linked to cell E85 of the "GS VER 2019 (CPI)" sheet, which included the correct value of 1,271.

Documentation provided by project participant		
☒ Changes in the MR	Section(s):	New version No.: 02
☒ Changes in XLS	Worksheet(s): GS VER CPII	New version No.: 02
☐ Other:		

DOE assessment	**Date:**	30/04/2019

MR version 0.1 Section 3.1:

1. Tables 15 and 16: The explanation is that Year 1 and 2 is for VPA-2 that is correct.
2. Operational Rate: The value 1,271 is derived from non-functioning o units during the monitoring period. The value applied in the ER is applied appropriately.

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

CAR from this verification

CAR ID	**A-1**	**Section no.**	**1.1**	**Date:**	**11/04/2019**

Description of CAR		
MR version 0.1, Section 1.1, table 1: The monitoring period shall be corrected to MP1 CPII instead of MPVI CPII.		
Project participant response	**Date:**	15/04/2019
The above has been addressed.		
Documentation provided by project participant		
☒ Changes in MR	Section(s): 1.1	New version No.: 0.2
☐ Changes in XLS	Worksheet(s):	New version No.:
☐ Other:		
DOE assessment	**Date:**	30/04/2019
MR version 0.2, Section 1.1, table 1: The monitoring period is corrected as MP1 CPII.		

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

CAR ID	**A-2**	**Section no.**	**1.3**	**Date:**	**11/04/2019**

Description of CAR

MR version 0.1, Section 1.3:

1. The date of the units built and commissioned in the period shall be from 03/11/2009 to 31/12/2016 in the VPA-1.
2. The cells for footnotes 8 and 9 are incorrect.

Project participant response **Date:** 15/04/2019

1. Section 1.3 of the MR has been updated to include reference only up until 31/12/2016.
2. The cells for footnotes 8 and 9 have been corrected now.

Documentation provided by project participant

☒	Changes in MR	Section(s): 1.3	New version No.: 0.2
☐	Changes in XLS	Worksheet(s):	New version No.:
☐	Other:		

DOE assessment **Date:** 30/04/2019

MR version 0.1, Section 1.3:

1. The date of the units built and commissioned in the period is updated from 03/11/2009 to 31/12/2016 in the VPA-1.
2. The cells for footnotes 8 and 9 are corrected in accordance to 20190211_IDBP_Database_VPA1.xls" sheet 'Master VPA-1' respective cells.

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

CAR ID	**A-3**	**Section no.**	**1.4**	**Date:**	**11/04/2019**

Description of CAR

MR version 0.1 section 1.4;

1. The heading for the section should be CPI MPVI and CPII MPI
2. Table 6 heading should be CPI MPVI and CPII MPI
3. The sentence below table 6, the MP should be included.

Project participant response **Date:** 15/04/2019

1. This has been updated as per request.
2. This has been updated as per request.
3. This has been updated as per request.

Documentation provided by project participant

☒	Changes in MR	Section(s): 1.4	New version No.: 0.2
☐	Changes in XLS	Worksheet(s):	New version No.:
☐	Other:		

DOE assessment **Date:** 30/04/2019

MR version 0.2 section 1.4; 1. The heading for the section is updated as CPI MPVI and CPII MPI 2. Table 6 heading is corrected as CPI MPVI and CPII MPI 3. The sentence below table 6, with the MP included.
Conclusion *Tick the appropriate checkbox* — ☐ Additional action should be taken (finding remains open) ☒ The finding is closed

CAR ID	**B-4**	**Section no.**	**2.5**	**Date:**	**11/04/2019**
Description of CAR					
MR version 0.1, Section 2.5: 1. These results are now re-applied for this sixth monitoring period. The CPs should be made clear. 2. The results of BFT and PFT has been conducted in December 2017 (“KPT 2018”) should be applied to CPII MPI.					
Project participant response				**Date:**	15/04/2019
1. A statement has been added to clarify that the KPT results refer to both CPs 2. The KPT results have been applied to both CPII MPI and CPI MPVI					
Documentation provided by project participant					
☒	Changes in MR	Section(s): 2.5		New version No.: 0.2	
☐	Changes in XLS	Worksheet(s):		New version No.:	
☐	Other:				
DOE assessment				**Date:**	30/04/2019
MR version 0.2, Section 2.5: 1. The sentence is corrected as “These results are now reapplied for both CPI MPVI and CPII MPI, which fall in the year 2018” that is correct. 2. The results of BFT and PFT has been conducted in December 2017 (“KPT 2018”) applies to both CPI MPVI and CPII MPI.					
Conclusion *Tick the appropriate checkbox* — ☐ Additional action should be taken (finding remains open) ☒ The finding is closed					

CAR ID	**C-2**	**Section no.**	**3.1**	**Date:**	**11/04/2019**
Description of CAR					
MR version 0.1, Section 3.1, Operational rate: The referred cell in footnote 33 is not traceable to the 20190211_IDBP_Database_VPA1” sheet “Non-functioning” cell H1679.					
Project participant response				**Date:**	15/04/2019
The MR Section 3.1 has been updated to the correct reference.					
Documentation provided by project participant					
☒	Changes in MR	Section(s): 3.1		New version No.: 0.2	
☐	Changes in XLS	Worksheet(s):		New version No.:	
☐	Other:				
DOE assessment				**Date:**	30/04/2019
MR version 0.3, Section 3.1, Operational rate: The referred cell in footnote 33 is corrected and traceable to the 20190211_IDBP_Database_VPA1” sheet “Non-functioning” H2899.					

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

CAR ID	**D-3**	**Section no.**	**3.1.1**	**Date:**	**11/04/2019**
Description of CAR					
MR version 0.1 section 3.1.1, table 17: 1. $O_{p1,y}$: CPII MPI data not included 2. $LE_{p1,y}$: CPII MPI data not included 3. GS-09: The referred cell for "20190211_IDBP_Database_VPA1" sheet "O&M training" cell G14573 is incorrect 4. GS-12: The referred cell for 20190211_IDBP_Database_VPA1" sheet "O&M training" cell G14557 is incorrect.					
Project participant response				**Date:**	15/04/2019
1. The data and source for $O_{p1,y}$ of CPII MPI has been added to table 17 2. The data and source for $LE_{p1,y}$ of CPII MPI has been added to table 17 3. The cell reference has been corrected. 4. The cell reference has been corrected.					
Documentation provided by project participant					
☒ Changes in MR		Section(s): 3.1		New version No.: 0.2	
☐ Changes in XLS		Worksheet(s):		New version No.:	
☐ Other:					
DOE assessment				**Date:**	30/04/2019
MR version 0.2 section 3.1.1, table 17: 1. $O_{p1,y}$: CPII MPI data and source updated and traceable. 2. $LE_{p1,y}$: CPII MPI data and source updated and traceable. 3. GS-09: The referred cell for "20190211_IDBP_Database_VPA1" sheet "O&M training" cell G14573 is corrected 4. GS-12: The referred cell for 20190211_IDBP_Database_VPA1" sheet "O&M training" cell G14557 is corrected.					
Conclusion *Tick the appropriate checkbox*	☐ Additional action should be taken (finding remains open) ☒ The finding is closed				

CAR ID	**C-4**	**Section no.**	**3.1.2**	**Date:**	**11/04/2019**
Description of CAR					
MR version 0.1, Section 3.1.2: 1. The referred fNRB below table 20 is for CPII MPI but CPI MPVI is not stated. 2. Table 21: The baseline emissions for CPI VI is not presented. 3. Table 23: The project emissions for CPI MPVI is not presented. 4. The fuel in MR is firewood but in GS VER 2019 CPI is biomass. Therefore, not consistent.					
Project participant response				**Date:**	15/04/2019

1. The comment has been incorporated in text below table 20 has been updated to feature both fNRB values.
2. The baseline emissions for CPI VI are now presented in table 21.
3. The project emissions for CPI MPVI are now presented in table 23.
4. For consistency, all firewood has been changed into biomass. The meaning of the two was meant to be the same and was therefore used interchangeably.

Documentation provided by project participant		
☒ Changes in MR	Section(s): 3.1	New version No.: 0.2
☐ Changes in XLS	Worksheet(s):	New version No.:
☐ Other:		

DOE assessment	**Date:**	30/04/2019

MR version 0.2, Section 3.1.2:

1. The referred fNRB below table 20 is for CPI MPVI is added.
2. Table 21: The baseline emissions for CPI VI is presented.
3. Table 23: The project emissions for CPI MPVI is presented.
4. The fuel in MR is change to biomass and consistent with GS VER 2019 CPI.

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

CAR ID	**C-5**	**Section no.**	**3.1.3**	**Date:**	**11/04/2019**

Description of CAR

MR version 0.1, Section 3.1.3:

1. Footnote 52: The referred cell for 20190215 BUS 2019 Tabulation JRI" sheet "BUS" cell S2082 is incorrect.
2. The baseline emissions from animal waste for CPII MPI is not included.
3. The project emissions from animal waste for CPII MPI is not included

Project participant response	**Date:**	15/04/2019

1. The footnote (now 54) has been corrected.
2. The MR Section 3.1.3 has been updated to reflect both CP values for the baseline emissions. Note however that these do not differ.
3. The MR Section 3.1.3 has been updated to reflect both CP values for the project emissions. Note however that these do not differ.

Documentation provided by project participant		
☒ Changes in MR	Section(s): 3.1	New version No.: 0.2
☐ Changes in XLS	Worksheet(s):	New version No.:
☐ Other:		

DOE assessment	**Date:**	

MR version 0.1, Section 3.1.3:

1. Footnote 52is change to footnote 54: The referred cell for 20190215 BUS 2019 Tabulation JRI" sheet "BUS" is corrected to S2109.
2. The baseline emissions from animal waste for CPII MPI is added.
3. The project emissions from animal waste for CPII MPI is added

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

CAR ID	**C-6**	**Section no.**	**3.1.4**	**Date:**	**11/04/2019**

Description of CAR

MR version 0.1, Section 3.1.4: Table 31:

1. Leakage emission assessment was not included CPII MPI
2. Emissions from biogas slurry is inconsistent with the value in GS VER 2019 (VPA 1) cell E72.

Project participant response **Date:** 15/04/2019

1. A statement in the title of table 31 has been added to clarify the leakage assessments relate to both CPs,
2. The emissions from bio slurry have been updated to be in line with cell E72.

Documentation provided by project participant

☒	Changes in MR	Section(s): 3.1	New version No.: 0.2
☐	Changes in XLS	Worksheet(s):	New version No.:
☐	Other:		

DOE assessment **Date:** 30/04/2019

MR version 0.2, Section 3.1.4: Table 31:

1. Leakage emission assessment for CPII MPI is added.
2. Emissions from biogas slurry is updated and consistent with the value in GS VER 2019 (VPA 1) cell E72.

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

CAR ID	**C-7**	**Section no.**	**3.1.5**	**Date:**	**11/04/2019**

Description of CAR

MR version 0.1 Section 3.1.5:

1. Footnote 59 should include CPII MPI
2. Table 33: The Head/average biodigester referred cell in 20190215 BUS 2019 Tabulation JRI" sheet "BUS" cell MC212 is not traceable
3. Footnotes 65 and 66 should include CPII MPI.
4. Table 36, Footnote 67: The referred cell for 20190215 BUS 2019 Tabulation JRI" sheet "BUS" cell W2714 is incorrect.

Project participant response **Date:** 15/04/2019

1. Footnote 59 change to 56 has been updated to refer to CPII MPI.
2. Table 33 has been updated to the correct reference.
3. Footnotes 65 & 66 change to 67 and 68 have been updated to include the reference to both CPs.
4. The footnote 69 in table 36 has been updated for clarity.

Documentation provided by project participant

☒	Changes in MR	Section(s): 3.1	New version No.: 0.2
☐	Changes in XLS	Worksheet(s):	New version No.:

☐ Other:	

DOE assessment	**Date:**	30/04/2019

MR version 0.1 Section 3.1.5:

1. Footnote 59 is change to footnote 56 and added CPII MPI
2. Table 33: The Head/average biodigester referred cell in 20190215 BUS 2019 Tabulation JRI" sheet "BUS" is update to cell S2109 and is correct.
3. Footnotes 65 and 66 change to 67 & 68 and included CPII MPI.
4. Table 36, Footnote 67 is change to 69: The referred cell for 20190215 BUS 2019 Tabulation JRI" sheet "BUS" is updated from cell 2704 to cell W2714.

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

CAR ID	**C-7**	**Section no.**	**3.1.6**	**Date:**	**11/04/2019**

Description of CAR

MR version 0.1, Section 3.1.6:

1. Table 39: The monthly ERs for CPII MPI are incorrect.
2. The ERs for CPII MPI are incorrect.
3. Table 40 ER for VPA-1 vintage to be corrected

Project participant response	**Date:**	15/04/2019

1. Table 39 has been updated to list the correct values.
2. The ERs for CPII MPI are corrected now.
3. Table 40 ER for VPA-1 vintage has also been corrected.

Documentation provided by project participant

☒ Changes in MR	Section(s): 3.1	New version No.: 0.2
☐ Changes in XLS	Worksheet(s):	New version No.:
☐ Other:		

DOE assessment	**Date:**	30/04/2019

MR version 0.1, Section 3.1.6:

1. Table 39: The monthly ERs for CPII MPI are corrected and consistent with ER spreadsheet.
2. The ERs for CPII MPI are corrected
3. Table 40 ER for VPA-1 vintage is corrected and consistent with ER spreadsheet.

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

CAR ID	**C-8**	**Section no.**	**3.1.7**	**Date:**	**11/04/2019**

Description of CAR

MR version 0.1, Section 3.1.7: The justification is not clear whether both CPI MPVI and CPII MPI are included.

Project participant response	**Date:**	15/04/2019

Text in Section 3.1.7 has been updated to clarify that reference is made to the results of both CPs.

Documentation provided by project participant

☒ Changes in MR	Section(s): 3.1	New version No.: 0.2
☐ Changes in XLS	Worksheet(s):	New version No.:
☐ Other:		

DOE assessment	**Date:**	
MR version 0.2, Section 3.1.7: The justification is updated that include both CPI MPVI and CPII MPI.		
Conclusion *Tick the appropriate checkbox*	☐ Additional action should be taken (finding remains open) ☒ The finding is closed	

CAR ID	**C-9**	**Section no.**	**ER calculations**	**Date:**	**11/04/2019**
Description of CAR					
ER Calculation version 01: GS VER 2019 CP1 sheet, Cells G11 and G44. The reference cell is not traceable.					
Project participant response				**Date:**	15/04/2019
The reference in the version 02 has been updated to the correct one.					
Documentation provided by project participant					
☐ Changes in MR		Section(s):		New version No.:	
☒ Changes in XLS		Worksheet(s): GS VER 2019 CP1		New version No.: 02	
☐ Other:					
DOE assessment				**Date:**	30/04/2019
ER Calculation version 02: GS VER 2019 CP1 sheet, Cells G11 and G44. The reference cell is corrected and traceable to referred spreadsheet.					
Conclusion *Tick the appropriate checkbox*	☐ Additional action should be taken (finding remains open) ☒ The finding is closed				

CAR ID	**C-10**	**Section no.**	**ER calculations**	**Date:**	**11/04/2019**
Description of CAR					
ER Calculation version 01, GS VER 2019 CP2 sheet: 1. Cell G11 and G44. The reference cell is not traceable. 2. Cell G88. The reference cell is not traceable					
Project participant response				**Date:**	15/04/2019
ER Calculation version 01, GS VER 2019 CP2 sheet: 1. The reference in the version 02 has been updated to the correct one. 2. Cell G86 has been updated to include the correct reference.					
Documentation provided by project participant					
☐ Changes in MR		Section(s):		New version No.:	
☒ Changes in XLS		Worksheet(s): GS VER 2019 CP2		New version No.: 02	
☐ Other:					
DOE assessment				**Date:**	
ER Calculation version 02, GS VER 2019 CP2 sheet: 1. Cell G11 and G44. The reference cell is corrected and traceable. 2. Cell G88. The reference cell is corrected and traceable					

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

CAR ID	**C-11**	**Section no.**	**ER calculations**	**Date:**	**11/04/2019**
Description of CAR					
ER Calculation version 01, cumulative sheet: The monthly ERs for cells E38 to E44 is not consistent with DK12 to DQ12.					
Project participant response				**Date:**	15/04/2019
This issue has been corrected now. The resulting lowered total ER of 45,994 has been updated in the MR.					
Documentation provided by project participant					
☐ Changes in MR			Section(s):		New version No.:
☒ Changes in XLS			Worksheet(s): Cumulative		New version No.: 02
☐ Other:					
DOE assessment				**Date:**	
ER Calculation version 02, cumulative sheet: The monthly ERs for cells E38 to E44 is corrected and consistent with DK12 to DQ12 thus reducing the ERs					
Conclusion *Tick the appropriate checkbox*	☐ Additional action should be taken (finding remains open) ☒ The finding is closed				

CAR ID	**C-12**	**Section no.**	**ER calculations**	**Date:**	**11/04/2019**
Description of CAR					
ER Calculation version 01, capacity calculation tab: Cell B6 to be corrected.					
Project participant response				**Date:**	15/04/2019
The name has been updated in version 02.					
Documentation provided by project participant					
☐ Changes in MR			Section(s):		New version No.:
☒ Changes in XLS			Worksheet(s): Capacity		New version No.: 02
☐ Other:					
DOE assessment				**Date:**	
ER Calculation version 02, capacity calculation tab: Cell B6 is corrected.					
Conclusion *Tick the appropriate checkbox*	☐ Additional action should be taken (finding remains open) ☒ The finding is closed				

VPA-2

Verification Topics	**No. of CAR**	**No. of CL**	**No. of FAR**
Description of project activity (A): - Project characterises - Technical project description - Units disseminated and summary Of emission reductions GHG emission reductions	1	0	0

Verification Topics	No. of CAR	No. of CL	No. of FAR
- Summary of VERs claimed CPI MPVI and CPII MPI			
Monitoring Activities (B) - Organisational setup of carbon and SD monitoring - Description of Human Resources - Survey Design - Biogas User Survey (US & CMS) - Survey Implementation - Baseline Fuel Test (BFT) and Project Performance Fuel Test (PFT) - KPT Survey, KPT Implementation	1	0	0
Results (C) - BUS survey results - Parameters monitored and not monitored - Emission reduction component 1 - Emission reduction component 2 - Baseline methane emissions - Project methane emissions - Leakage emissions - Emissions from Bio-slurry - Ex-post estimate of emission reductions - Justification for ER difference with PDD	7	3	0
Sustainability Monitoring (D) - Safeguarding principles - Sustainability Development Assessment	3	0	0
Stakeholder Feedback (E)	0	0	0
Data Quality Control and Assurance (F)	0	0	0
Project Participants (G)	0	0	0
SUM	**12**	**3**	**0**

The following tables include all raised CARs, CLs and FARs and the assessments of the same by the verification team. For an in depth evaluation of all verification items it should be referred to the verification protocols (see Annex).

CL from this verification

CL ID	C-1	Section no.	3.1	Date:	11/04/2019

Description of CL			
MR version 0.1, Section 3.1: 1. PP is request to clarify the source of data for tables 15 and 16. 2. Refer 20190215 BUS 2019 Tabulation JRI, drop-off sheet, row 30, VPA-2 starts in year 2017, how could there be year 3 to year 9 data. 3. PP is request to clarify "age groups 1 through 1" in paragraph below table 16. 4. Clarify the MP referred in 2nd paragraph in section heading "Operational Rate".			
Project participant response		**Date:**	07/05/2019
1. For table 15: See footnote 25, as per "20190215 BUS 2019 Tabulation JRI" sheet "BUS" cells C5 – D8. For table 16: See footnote 26, which has been expended to include the reference. 2. Note this was a typo. This should state "VPA-1". The typo has been corrected, same version of the document. 3. This should state instead: age groups 1 through 2 (the 2 age groups of the VPA-2). 4. The MP has been updated to read "MPII".			
Documentation provided by project participant			
☒	Changes in the MR	Section(s): 3.1	New version No.: 0.2
☐	Changes in XLS	Worksheet(s):	New version No.:
☒	Other:	20190215 BUS 2019 Tabulation JRI	
DOE assessment		**Date:**	08/05/2019
MR version 0.2, Section 3.1: 1. PP is request to clarify the source of data for tables 15 and 16. 2. Refer 20190215 BUS 2019 Tabulation JRI, drop-off sheet, row 30, correction made from year 3 to year 9 is for VPPA1. 3. PP has corrected sentence to read as "age groups 1 through 2" in paragraph below table 16. 4. The 2nd paragraph in section heading "Operational Rate" is corrected to read as MPII.			
Conclusion *Tick the appropriate checkbox*	☐ Additional action should be taken (finding remains open) ☒ The finding is closed		

CL ID	**C-2**	**Section no.**	**3.1.3**	**Date:**	**11/04/2019**
Description of CL					
MR version 0.1, Section 3.1.3: PP is request to clarify the 94% of VPA-2 households dairy cows in footnotes 45 and 49 is derive.					
Project participant response				**Date:**	07/05/2019
The source of the 94% (footnote 46 and 50) has been added in a new footnote: Source: "20190215 BUS 2019 Tabulation JRI" sheet "BUS" cell U2082.					
Documentation provided by project participant					
☒	Changes in the MR	Section(s): 3.1		New version No.: 0.2	
☐	Changes in XLS	Worksheet(s):		New version No.:	
☒	Other:	20190215 BUS 2019 Tabulation JRI"			
DOE assessment				**Date:**	08/05/2019
MR version 0.2, Section 3.1.3: The source of 94% for VPA-2 households dairy cows in footnotes 45 and 49 (now 46 & 50) is derive from cell U2082 of 20190215 BUS 2019 Tabulation JRI" sheet "BUS"					

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

CL ID	**C-3**	**Section no.**	**3.1.5**	**Date:**	**11/04/2019**
Description of CL					
MR version 0.1, Section 3.1.5: 1. PP is request to clarify the BUS year, 95% and MP for footnote 58. 2. PP is request to clarify the MP in footnotes 60 and 61.					
Project participant response				**Date:**	07/05/2019
1. See updated MR now footnote 59 is corrected to 94% 2. The MP for footnotes now 61 and 62) corrected.					
Documentation provided by project participant					
☒ Changes in the MR		Section(s): 3.1		New version No.: 0.2	
☐ Changes in XLS		Worksheet(s):		New version No.:	
☐ Other:					
DOE assessment				**Date:**	08/05/2019
MR version 0.2, Section 3.1.5: 1. Footnote 58 (now 59) is updated as 94%. 2. The MP is update to MPII for footnotes 60 and 61 (now 61 & 62)					
Conclusion *Tick the appropriate checkbox*	☐ Additional action should be taken (finding remains open) ☒ The finding is closed				

CAR from this verification

CAR ID	**A-1**	**Section no.**	**1.3**	**Date:**	**11/04/2019**
Description of CAR					
MR version 0.1, Section 1.3: The reference cells for footnote 7 and 8 is not traceable 20190211_IDBP_Database_VPA2.xls" sheet 'Master VPA-2'					
Project participant response				**Date:**	07/05/2019
Both footnotes have been updated to list the correct reference.					
Documentation provided by project participant					
☒ Changes in MR		Section(s): 1.3		New version No.: 0.2	
☐ Changes in XLS		Worksheet(s):		New version No.:	
☒ Other:		20190211_IDBP_Database_VPA2.xls"			
DOE assessment				**Date:**	08/05/3029
MR version 0.2, Section 1.3: The reference cells for footnote 7 and 8 are corrected and traceable 20190211_IDBP_Database_VPA2.xls" sheet 'Master VPA-2'					
Conclusion *Tick the appropriate checkbox*	☐ Additional action should be taken (finding remains open) ☒ The finding is closed				

CAR ID	**B-1**	**Section no.**	**2.5.1**	**Date:**	**11/04/2019**
Description of CAR					
MR version 0.1, section 2.5.1, table 12: The MP stated in implementation is incorrect.					

Project participant response			**Date:**	07/05/2019
The MP has been updated as per request.				
Documentation provided by project participant				
☒	Changes in MR	Section(s): 2.5	New version No.: 0.2	
☐	Changes in XLS	Worksheet(s):	New version No.:	
☐	Other:			
DOE assessment			**Date:**	08/05/2019
MR version 0.2, section 2.5.1, table 12: The MP stated in implementation is corrected.				
Conclusion *Tick the appropriate checkbox*	☐ Additional action should be taken (finding remains open) ☒ The finding is closed			

CAR ID	**C-4**	**Section no.**	**3.1**	**Date:**	**11/04/2019**
Description of CAR					
MR version 0.1, section 3.1, table 15: The referred footnote 25 for cells C5 to D8 is not traceable in 20190215 BUS 2019 Tabulation JRI" sheet "BUS".					
Project participant response				**Date:**	07/05/2019
The footnote reference has been updated. The correct sheet is "Drop-off", and not "BUS" as previously mentioned.					
Documentation provided by project participant					
☒	Changes in MR	Section(s): 3.1	New version No.: 0.2		
☐	Changes in XLS	Worksheet(s):	New version No.:		
☐	Other:				
DOE assessment				**Date:**	08/05/2019
MR version 0.2, section 3.1, table 15: The referred footnote 25 for cells C5 to D8 is corrected and traceable to 20190215 BUS 2019 Tabulation JRI" sheet "Dropoff".					
Conclusion *Tick the appropriate checkbox*	☐ Additional action should be taken (finding remains open) ☒ The finding is closed				

CAR ID	**C-5**	**Section no.**	**3.1.1**	**Date:**	**11/04/2019**
Description of CAR					
MR version 0.1, Section 3.1.1, table 17: 1. $N_{T,h}$: The referred cell in 20190215 BUS 2019 Tabulation JRI sheet "BUS", is not traceable. 2. GS-10: The applied value for number of direct jobs is not traceable. 3. GS-10: The referred cell is not traceable in 20190211_IDBP_Database_VPA2" sheet "SPV"					
Project participant response				**Date:**	07/05/2019
1. The reference to $N_{T,h}$ has been corrected now. 2. The GS-10 reference has been corrected now. 3. Same as above.					
Documentation provided by project participant					
☒	Changes in MR	Section(s): 3.1	New version No.: 0.2		
☐	Changes in XLS	Worksheet(s):	New version No.:		
☒	Other:	20190215 BUS 2019 Tabulation JRI			
DOE assessment				**Date:**	08/05/2019

MR version 0.2, Section 3.1.1, table 17: 1. $N_{T,h}$: The referred cell in 20190215 BUS 2019 Tabulation JRI sheet “BUS”, is corected and traceable. 2. GS-10: The applied value for number of direct jobs is updated and traceable to 20190211_IDBP_Database_VPA2” sheet “SPV” cell L221. 3. GS-10: The referred cell is updated to L221 and traceable to 20190211_IDBP_Database_VPA2” sheet “SPV”

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

CAR ID	**C-6**	**Section no.**	**3.1.3**	**Date:**	**11/04/2019**
Description of CAR					
MR version 0.1 Section 3.1.3: 1. The referred MR in footnotes 45 and 49 is incorrect. 2. The referred data cell in table 28 for footnote 47, 20190215 BUS 2019 Tabulation JRI” sheet “BUS” cell S2082 has not data.					
Project participant response				**Date:**	07/05/2019
1. The MR in the footnotes have been corrected (now 45 and 50) 2. The referred data cell in table 28 has been updated accordingly.					
Documentation provided by project participant					
☒	Changes in MR	Section(s): 3.1		New version No.: 0.2	
☐	Changes in XLS	Worksheet(s):		New version No.:	
☒	Other:	20190215 BUS 2019 Tabulation JRI			
DOE assessment				**Date:**	08/05/2019
MR version 0.2 Section 3.1.3: 1. The referred MR in footnotes are corrected 2. The referred data cell in table 28 for footnote 47 (now 48) is updated to U2109 and traceable to 20190215 BUS 2019 Tabulation JRI” sheet “BUS”.					

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

CAR ID	**C-7**	**Section no.**	**3.1.4**	**Date:**	**11/04/2019**
Description of CAR					
MR version 0.1, Section 3.1.4, table 31: The value for emissions of bio-slurry is inconsistent with the ER spreadsheet GS VER 2019 cell E72.					
Project participant response				**Date:**	07/05/2019
The value for bio slurry emissions have been updated to match that of the ER calculation sheet.					
Documentation provided by project participant					
☒	Changes in MR	Section(s): 3.1		New version No.: 0.2	
☐	Changes in XLS	Worksheet(s):		New version No.:	
☐	Other:				
DOE assessment				**Date:**	08/05/2019

MT version 0.2, Section 3.1.4, table 31: The value for emissions of bio-slurry is corrected and consistent with the ER spreadsheet GS VER 2019 cell E72.
Conclusion *Tick the appropriate checkbox* — ☐ Additional action should be taken (finding remains open) ☒ The finding is closed

CAR ID	**C-8**	**Section no.**	**3.1.5**	**Date:**	**11/04/2019**

Description of CAR

MR version 0.1 Section 3.1.5:

5. Footnote 54: The referred MP is incorrect.
6. Table 32: The Head/average biodigester referred cell in 20190215 BUS 2019 Tabulation JRI" sheet "BUS" cell MC212 is not traceable
7. The value for Head / average biodigester is inconsistent with ER spreadsheet Bio-slurry 2019 tab cell D11.
8. The value for Total amount of VS excreted is inconsistent with ER spreadsheet Bio-slurry 2019 tab cell E11.
9. The referred MR in footnotes 58 and 61 is incorrect.
10. Table 36, Footnote 62: The referred cell for 20190215 BUS 2019 Tabulation JRI" sheet "BUS" cell W2714 is incorrect.

Project participant response	**Date:**	07/05/2019

1. Footnote was 54, now 55 has been corrected now.
2. The value in table 34 has been updated, and so has the reference.
3. Same as above.
4. This value has now been corrected.
5. The referred footnotes was 58 and 61, now is 59 and 61 have now been corrected.
6. The footnote 62, now 63 in table 36 has been corrected.

Documentation provided by project participant

☒ Changes in MR	Section(s): 3.1	New version No.: 0.2
☐ Changes in XLS	Worksheet(s):	New version No.:
☒ Other:	20190215 BUS 2019 Tabulation JRI	

DOE assessment	**Date:**	08/05/2019

MR version 0.2, Section 3.1.5:

1. Footnote 54: The footnote is update as 55 and referred MP is corrected.
2. Table 32: The Head/average biodigester referred cell in 20190215 BUS 2019 Tabulation JRI" sheet "BUS" is corrected as cell U2109.
3. The value for Head / average biodigester is corrected and consistent with ER spreadsheet Bio-slurry 2019 tab cell D11.
4. The value for Total amount of VS excreted is corrected and consistent with ER spreadsheet Bio-slurry 2019 tab cell E11.
5. The referred MR in footnotes 58 and 61 (now 59 and 61) is corrected.
6. Table 36, Footnote 62 (now 63) the referred cell for 20190215 BUS 2019 Tabulation JRI" sheet "BUS" cell W2714 is corrected.

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

CAR ID	**C-9**	**Section no.**	**3.1.7**	**Date:**	**11/04/2019**
Description of CAR					
MR version 0.1 Section 3.1.7: 1. Table 42: The ex-ante and ex-post data are to be reversed. 2. Footnotes 66 and 67: The refereed VPA ER calculations is incorrect.					
Project participant response				**Date:**	07/05/2019
1. Table 42 has been corrected, as indicated. 2. Footnotes (previously 66 and 67, now 67 and 68) have been corrected.					
Documentation provided by project participant					
☒ Changes in MR		Section(s): 3.1		New version No.: 0.2	
☐ Changes in XLS		Worksheet(s):		New version No.:	
☐ Other:					
DOE assessment				**Date:**	08/05/2019
MR version 0.2, Section 3.1.7: 1. Table 42: The ex-ante and ex-post data are corrected accordingly. 2. Footnotes 66 and 67: The refereed footnotes are corrected as 67 and 68 as VPA ER calculations.					
Conclusion *Tick the appropriate checkbox*	☐ Additional action should be taken (finding remains open) ☒ The finding is closed				

CAR ID	**C-10**	**Section no.**	**ER Spreadsheet**	**Date:**	**11/04/2019**
Description of CAR					
ER spreadsheet version 01, 1. GS VER 2019 tab: The reference for cells G11 and G44 is not traceable in the referred spreadsheet. 2. Cumulative VER tab: Cell H33 to be corrected 3. Capacity Calculation tab: Cell B3 to be corrected					
Project participant response				**Date:**	07/05/2019
1. The reference for cells G11 and G44 has been corrected. 2. Cell H33 has been corrected, same version of ER remains but date updated of the file. 3. Cell B3 has been corrected.					
Documentation provided by project participant					
☒ Changes in MR		Section(s): GS VER 2019		New version No.: 02	
☒ Changes in XLS		Worksheet(s):		New version No.: 02	
☐ Other:					
DOE assessment				**Date:**	08/05/2019

ER spreadsheet version 02, 1. GS VER 2019 tab: The reference for cells G11 and G44 is corrected and traceable to the referred spreadsheet. 2. Cumulative VER tab: Cell H33 to be corrected 3. Capacity Calculation tab: Cell B3 corrected

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

CAR ID	**D-1**	**Section no.**	**4.2.1**	**Date:**	**11/04/2019**
Description of CAR					
MR version 0.1, Section 4.2.1, Indicator GS-06: 1. The number of training is not consistent with the SPV tab of DB spreadsheet. 2. The referred cell L217 in 20190211_IDBP_Database_VPA2 sheet “SPV” did not state 51.					
Project participant response				**Date:**	07/05/2019
1. Trainings data (for GS-06) is presented in sheet “SPV”, cell L217 as per the MR. This is correct and traceable. 2. The referred cell L217 in 20190211_IDBP_Database_VPA2 sheet “SPV” is update as 51.					
Documentation provided by project participant					
☒	Changes in MR	Section(s): 4.2	New version No.: 0.2		
☐	Changes in XLS	Worksheet(s):	New version No.:		
☒	Other:	20190211_IDBP_Database_VPA2			
DOE assessment				**Date:**	08/05/2019
MR version 0.2, Section 4.2.1, Indicator GS-06: 1. The number of training is corrected and consistent with the SPV tab of DB spreadsheet. 2. The referred cell L217 in 20190211_IDBP_Database_VPA2 sheet “SPV” is corrected to state 51.					
Conclusion *Tick the appropriate checkbox*	☐ Additional action should be taken (finding remains open) ☒ The finding is closed				

CAR ID	**D-2**	**Section no.**	**4.2.1**	**Date:**	**11/04/2019**
Description of CAR					
MR version 0.1, Section 4.2.1, Indicator GS-09: The number of women attended training is not consistent with 20190211_IDBP_Database_VPA1” sheet “O&M training” cell H14558.					
Project participant response				**Date:**	07/05/2019
The footnote (73) has been corrected to contain the right reference to the database					
Documentation provided by project participant					
☒	Changes in MR	Section(s): 4.2	New version No.: 0.2		
☐	Changes in XLS	Worksheet(s):	New version No.:		
☒	Other:	20190211_IDBP_Database_VPA1”			
DOE assessment				**Date:**	08/05/2019
MR version 0.2, Section 4.2.1, Indicator GS-09: The number of women attended training is corrected and consistent with 20190211_IDBP_Database_VPA1” sheet “O&M training” cell I3238.					

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

CAR ID	**D-3**	**Section no.**	**4.2.1**	**Date:**	**11/04/2019**
Description of CAR					
MR version 0.1, Section 4.2.1, Indicator GS-10: 1. The number of jobs and employment are not consistent with 20190211_IDBP_Database_VPA2" sheet "SPV 2. The referred cell 20190211_IDBP_Database_VPA2" sheet "SPV L213 is incorrect.					
Project participant response				**Date:**	07/05/2019
1. The number of jobs and employment is updated in the SPV sheet. 2. The referred cell has now been updated.					
Documentation provided by project participant					
☒ Changes in MR		Section(s): 4.2		New version No.: 0.2	
☐ Changes in XLS		Worksheet(s):		New version No.:	
☒ Other:		20190211_IDBP_Database_VPA2" sheet			
DOE assessment				**Date:**	08/05/2019
MR version 0.2, Section 4.2.1, Indicator GS-10: 1. The SPV sheet is review and the number of jobs and employment corrected. 2. The referred cell of 20190211_IDBP_Database_VPA2" sheet " is corrected.					
Conclusion *Tick the appropriate checkbox*	☐ Additional action should be taken (finding remains open) ☒ The finding is closed				

5. SUMMARY OF VERIFICATION ASSESSMENTS

The following paragraphs include the summary of the final verification assessments after all CARs and CLs are closed out. For details of the assessments pl. refer to the discussion of the verification findings in chapter 4 and the verification protocol (Annex 1).

5.1. Involved Parties and Project Participants

The following parties to the Kyoto Protocol and project participants are involved in this project activity.

Table 5-1: Project Parties and project participants

Characteristic	Party	Project Participant
Non-Annex 1	Indonesia	HIVOS Indonesia
Annex 1	Netherlands	HIVOS Netherlands Netherlands

5.2. Implementation of the project

During the verification, a site visit was carried out from 08/04/2019 to 11/04/2019. On the basis of this site visit and the reviewed project documentation it can be confirmed that w.r.t. the realized technology, the project equipment the project has been implemented and operated as described in the GS registered PoA-DD, VPA-DD and GS Passport.

This is the 6th periodic verification of the CPI and 1st periodic verification of the CPII monitoring period for VPA-1 from 01/01/2018 to 31/05/2018 and period 01/06/2018 to 31/12/2018 (both days inclusive) and 2nd periodic verification of the CPI monitoring period for VPA-2 from 01/01/2018 to 31/12/2018 (both dates inclusive).

There are no new digesters installed for this 6th CPI and 1st CPII monitoring period for VPA-1 post 31/12/2016. The total number of bio-digesters commissioned as at 31/12/2018 are still 20,253 units.

There are 3,450 digesters built and commissioned for VPA-2 as at 31/12/2018.

During this monitoring period, there were 4,060 units were non-operational with a weighted average results of drop-off rate of 79.95% for VPA-1. These drop-off units were excluded in the carbon emissions calculation. The survey data was reviewed to confirm the percentage of non-operation units for each group.

For this monitoring period there were 998 units were non-operational with a weighted average results of drop-off of 71.08% for VPA-2. These drop-off units were excluded

in the carbon emissions calculation. The survey data was reviewed to confirm the percentage of non-operation units for each group.

VPA-1: Refer CAR A1, CAR A2 and CAR A3 raised and closed out.

VPA-2: Refer CAR A1 raised and closed out.

5.3. Project history

VPA-1

During the validation the validating DOE might have raised issues that could not be closed or resolved during the validation stage. For this purpose, FARs might have been raised. All FARs raised during the validation have been addressed by the verifying DOE during the 1st verification

During the 1st verification of MPI, the verifying DOE and GS have raised several FARs. All FARs raise were closed out during the 2nd verification.

During the 2nd verification FAR E7 was raised for consideration in this 3rd verification. The leakage assessment has been conducted and the project emissions for the previous monitoring periods have been retroactively calculated and included in the ER calculations. Thus, it is reflected in the ERs for the 3rd monitoring period.

During the 3rd verification, FAR D5 was raised and was not addressed. In addition, during GS issuance review, a FAR #1 was raised as regards to cover all the provinces where bio-digesters were constructed when conduct simple random sample survey for next verification. The FAR was addressed appropriately and closed out through CAR raised.

During the 4th verification, GS has raised FAR#1 as regards to each of the monitoring and usage survey shall cover all the involved provinces of the project activity. /GSIRVPA1/

The DOE could conclude the monitoring and usage survey conducted in December 2018 covers all nine (9) provinces.

VPA-2:

There was no FAR raised by GS during the review of the registration and validating DOE during inclusion of the VPA.

5.4. Post registration changes

No post registration changes applicable for this monitoring period have been observed for both VPA-1 and VPA-2.

5.5. Compliance with the monitoring plan

The monitoring system and all applied procedures are in compliance to monitoring plan of the registered GS VPA-DD and GS PoA-DD. Evidence was available to the verification team to check the compliance of the monitoring plan.

The reporting procedures reflect the requirements of the monitoring plan for the carbon monitoring and sustainability development criteria. All relevant data stored is for the whole monitoring period and traceable to the computer server at the PP office.

5.6. Compliance with the monitoring methodology

The monitoring system is in compliance with the applied monitoring methodology "Technologies and practices to displace decentralized thermal energy consumption", version 1.0.

5.7. Carbon Monitoring parameters

During the verification all relevant monitoring parameters (as listed in section B.6.1 of VPA1DD and section D.7.1 of VPA2DD) have been verified with regard to the appropriateness of the applied measurement / determination method, the correctness of the values applied for ER calculation, the accuracy, and applied QA/QC measures. The results as well as the verification procedure are described parameter-wise in the project specific verification checklist.

Data and parameters monitored:

VPA-1:

Parameter	Monitored Value	Verification Opinion
$U_{p1,y}$: Cumulative usage rate for technologies in project scenario p1 in year y, based on cumulative adoption rate and drop off rate (fraction)	79.95%	The data is the calculated weighted average based on the age group percentage of units in operation. Age group 3: 80.00% Age group 4: 67.50% Age group 5: 79.41% Age group 6: 78.38% Age group 7: 88.57% Age group 8: 88.89% Age group 9: 73.53% The age group results are derived from the usage survey report. /BUS/
$N_{p1,y}$: Cumulative project operational rate included in	16,151	The data is the number of units in operation for the monitoring period.

Parameter	Monitored Value	Verification Opinion
the project database for project scenario p1 against baseline scenario b1 in year y		The data is calculated using the usage survey results, the number of days units are in operation in a year. /BUS/ ER Calculation VPA 1 MP6_v03" sheet GS VER 2019 (CPI & CPII)
$No_{p1,y}$: Cumulative number of project technologies included in the project database for project scenario p1 in year y	20,253	The data is the total number of biodigesters installed as at 31/12/2016 derived from the project database. /VPA1DB/ "20190211_IDBP_Database_VPA1"Master VPA-1/ERVPA1
$O_{p1,y}$: The average technology-days during which the biodigesters are operational for project scenario p1 against baseline scenario b1 in year y	364.06	The data is calculated as shown in footnote[1] below. The data is derived from "ER Calculation VPA 1 MP6_v03" sheet GS VER 2019 (CPI) and sheet GS VER 2019 (CPII)" /ERVPA1/
$LE_{p1,y}$: Leakage in project scenario p1 during year y	0.037 tCO_2e/year VPA1 CPI 0.033 tCO_2e/year VPA1 CPII	A leakage assessment has been conducted as part of the BUS 2018. The results reported 4.58% of the households use more firewood was applied to determine the leakage per year. /L1/ ER Calculation VPA 1 MP6_v03" sheet GS VER 2019 (CPI)" and sheet GS VER 2019 (CPII)" /ERVPA1/
$N_{T,h}$: Number of animals of livestock category T in premise h	Dairy cow: 5.87	The data is derived from "20190215 BUS 2019 Tabulation JRI sheet "BUS"
	Market swine: 0	During this monitoring period, in the usage survey conducted, however, the market swine households in the survey list taken into account for the drop-off rate and not in the monitoring survey. Therefore, no data captured.
PL: Physical leakage of the biodigester	10%	The value is default data derived from the registered GS VPA-DD section B.6.1.
$BB_{b1,bio}$: Amount of woody biomass used in the baseline scenario b1	1.435 t/y	The data is derive from the KPT survey conducted between 14/12/2017 and 24/12/2017 applicable for this monitoring period. /KPT/ 20180407 KPT December 2017" sheet 90-30 Test, cell F65/KPT/

[1] Calculated as 365 - (malfunctioning digesters * maximum amount of days of malfunctioning)/ $No_{p1,y}$, therefore = 365 – ((1271*15)/ 20,253) = 364.06

Parameter	Monitored Value	Verification Opinion
$BB_{p1,bio}$: Quantity of biomass consumed in project scenario p1 during year y	0.719 t/y	The data is derived from the KPT survey conducted between 14/12/2017 and 24/12/2017 applicable for this monitoring period. /KPT/ "20180407 KPT December 2017" sheet 90-30 Test, cell S65 /KPT/
$BB_{b1,fuel}$: Amount of fossil fuels used in the baseline scenario b1	LPG: 0.088 t/y	The data is derive from the KPT survey conducted between 14/12/2017 and 24/12/2017 applicable for this monitoring period. /KPT/ "20180407 KPT December 2017" sheet 90-30 Test, /KPT/
$BB_{p1,fuel}$: Quantity of fossil fuel consumed in project scenario p1	LPG: 0.048 t/y	The data is derive from the KPT survey conducted on 2017-12-14 and 2017-12-24 applicable for this monitoring period. /KPT/ "20180407 KPT December 2017" sheet 90-30 Test, cell V65 /KPT/
$MS_{P,S,K}$: Fraction of livestock category T's manure not treated in bio-digester, in climate region k	Dairy cow: 19.0%	The data is based on the usage survey results as shown in the Primary data BUS 2019 /BUS/
	Market swine: 0%	During this monitoring period, in the usage survey conducted, the market swine households in the survey list was considered for the drop-off rate since no monitoring survey was conducted. Therefore, no data determined.
$MS_{T,S,k}$: Fraction of livestock category T's manure fed into the bio-digester, S in climate region k	Dairy cow: 81.0%	20190215 BUS 2019 Tabulation JRI sheet "BUS"
	Market swine: 0%	During this monitoring period, in the usage survey conducted, the market swine households in the survey list was considered for the drop-off rate since no monitoring survey was conducted. Therefore no data determined.
GWP_{CH4}: Global Warming Potential of methane	25	The data is a default value applicable for the 2nd commitment period as from 2013-01-01 and derived from IPCC[2].
Bio: Use of bio-slurry	54%	The data is based on the usage survey results as shown in ""BUS "20190215 BUS 2019 Tabulation JRI sheet "BUS"

After appropriate corrections were carried out by the project participant it can be confirmed that all monitoring parameters have been measured / determined without material misstatements and in line with all applicable standards and relevant

[2] Available on: http://www.ipcc.ch/publications_and_data/ar4/wg1/en/ch2s2-10-2.html

requirements.

Refer CL B1, CL B2, CLB3 and CAR B4 raised and closed out.

VPA-2:

Parameter	Monitored Value	Verification Opinion
$U_{p1,y}$: Cumulative usage rate for technologies in project scenario p1 in year y, based on cumulative adoption rate and drop off rate (fraction)	71.08%	The data is the calculated weighted average based on the age group percentage of units in operation. Age group 1: 80.00% Age group 2: 64.86% 20190215 BUS 2019 Tabulation JRI" sheet "Drop-off"
$N_{p1,y}$: Cumulative project operational rate included in the project database for project scenario p1 against baseline scenario b1 in year y	2,228	The data is the number of units in operation for the monitoring period that derived from 20190506 ER Calculation VPA 2 MP2_v02" sheet GS VER 2019
$No_{p1,y}$: Cumulative number of project technologies included in the project database for project scenario p1 in year y	3,450	The data is the total number of biodigesters installed as at 31/12/2018 was derived from the project database. "20190211_IDBP_Database_VPA2" sheet "Master VPA-2"
$O_{p1,y}$: The average technology-days during which the biodigesters are operational for project scenario p1 against baseline scenario b1 in year y	363.37	The data is calculated as shown in footnote[3] below. The data is derived from 20190506 ER Calculation VPA 2 MP2_v02" sheet GS VER 2019
$LE_{p1,y}$: Leakage in project scenario p1 during year y	0.037 tCO_2e/year	A leakage assessment has been conducted as part of the BUS 2018. The results reported 4.58% of the households use more firewood was applied to determine the leakage per year. 20190506 ER Calculation VPA 2 MP2_v02" sheet GS VER 2019
	Dairy cow: 4.78	The data is derived from 20190215 BUS 2019 Tabulation JRI sheet "BUS.

[3] Calculated as 365 - (malfunctioning digesters * maximum amount of days of malfunctioning)/ $No_{p1,y}$, therefore = 365 – ((375.153*15)/ 3,450) = 363.37

Parameter	Monitored Value	Verification Opinion
$N_{T,h}$: Number of animals of livestock category T in premise h	Market swine: 0	During this monitoring period, in the usage survey conducted there were no capture data market swine.
PL: Physical leakage of the biodigester	10%	The value is default data derived from the registered VPA-2 DD section B.5.2
$BB_{b1,bio}$: Amount of woody biomass used in the baseline scenario b1	1.435 t/y	The data is derived from 20180407 KPT December 2017" sheet 90-30 Test.
$BB_{p1,bio}$: Quantity of biomass consumed in project scenario p1 during year y	0.719 t/y	The data is derived from the KPT survey conducted between 14/12/2017 and 24/12/2017 applicable for this monitoring period. "20180407 KPT December 2017" sheet 90-30 Test.
$BB_{b1,fuel}$: Amount of fossil fuels used in the baseline scenario b1	LPG: 0.088 t/y	The data is derived from the KPT survey conducted from 14/12/2017 to 24/12/2017 applicable for this monitoring period. 20180407 KPT December 2017" sheet 90-30 Test.
$BB_{p1,fuel}$: Quantity of fossil fuel consumed in project scenario p1	LPG: 0.048 t/y	The data is derived from the KPT survey conducted from 14/12/2017 to 24/12/2017 applicable for this monitoring period. 20180407 KPT December 2017" sheet 90-30 Test.
$MS_{P,S,K}$: Fraction of livestock category T's manure not treated in bio-digester, in climate region k	Dairy cow: 22.0%	The data is based on the usage survey results as shown in the Primary data BUS 2019
	Market swine: 0%	During this monitoring period, in the usage survey conducted there were no capture data market swine.
$MS_{T,S,k}$: Fraction of livestock category T's manure fed into the bio-digester, S in climate region k	Dairy cow: 78%	The data is based on the results shown in BUS Report 2019. 20190215 BUS 2019 Tabulation JRI sheet "BUS"
	Market swine: 0%	During this monitoring period, in the usage survey conducted there were no capture data market swine
GWP_{CH4}: Global Warming Potential of methane	25	The data is a default value applicable for the 2nd commitment period as from 01/01/2013 and derived from IPCC[4].

[4] Available on: http://www.ipcc.ch/publications_and_data/ar4/wg1/en/ch2s2-10-2.html

Parameter	Monitored Value	Verification Opinion
Bio: Use of bio-slurry	64%	The data is based on the usage survey results as shown in "20190215 BUS 2019 Tabulation JRI sheet "BUS"

After appropriate corrections were carried out by the project participant it can be confirmed that all monitoring parameters have been measured / determined without material misstatements and in line with all applicable standards and relevant requirements.

Refer CL B1 raised and closed out.

Data and parameters not monitored:

The ex-ante parameters for VPA-1 in table 18 of MR are derived from section B.5.1 of the registered VPA-DD version 7.0 for CPI from 01/06/2011 to 31/05/2018 and VPA-DD version 10.1 section B.4.2 for CPII from 01/06/2018 to 31/05/2025.

The ex-ante parameters for VPA-2 in table 18 are derived from section D.7.1 of the registered VPA-DD version 1.3 for the CPI from 02/01/2017 to 01/01/2024.

5.8. Monitoring report(s)

A GS Monitoring Report along with relevant supporting documents was submitted to the verification team by the project participants. These documents form the basis for the verification opinion of TÜV NORD.

During the verification, mistakes and needs for clarification were identified. The PP has carried out the requested corrections so that it can be confirmed that the Monitoring report is complete and transparent and accordance with the registered VPA-DDs, the GS PoA Passport and relevant GS requirements.

5.9. Sampling

5.9.1. Implementation of the sampling plan

The PP has taken the approach for the sampling plan by adopting EB69 Annex 5 which includes level of assurance.

The biogas usage survey has a design confidence precision level of at least 90/10 according to the GS requirement. The BUS sample size for VPA-1 is 256 households with 203 households were visited and interviewed and 53 households reported drop-off.. There were 7 age groups of 30 households per age group making a total of 210 as minimum thresholds.

The VPA-2 has 2 age groups. Therefore, as per GS guidelines, 30 households were to be selected, making a total of 73... This exceeds the 2 age groups * 30 households = 60 households minimum threshold. 72 households were visited with 52 households completing the interview. The 20 households are reported as drop-offs

For the PFT and BFT a sample size of 55 each were selected with a total of 110 households.

The verification team has checked on the sampling plan and considered appropriate since an addition of 10% has been included to ensure the level of assurance and the number of households is representative.

VPA-1: Refer CL B-1, CL B-2 and CL B-3 raised and closed out.

5.9.2. Sampling approaches during verification

The verification team has applied the sampling plan based on 90/10 confidence level to ensure the households interviewed are representative to meet GS requirements. The number of installed units as at 31/12/2018 for VPA-1 is 20,253 and 3,450 for VPA-2.

Using the link http://www.raosoft.com/samplesize.html to calculate the sample size, 68 households will be sufficient to obtain a confidence level of 90.

To be conservative, the verification team selected a sample size of 158 for VPA-1 households from the clusters in the different villages, different districts & different provinces. Out of the 158 householders, 52 householders were visited for onsite inspection and 106 households were interviewed via telephone. /LHH/

A sample size of 137 for VPA-2 households from the clusters in the different villages, different districts & different provinces was drawn. Out of the 137 households, 32 householders visited for onsite inspection and interviewed 105 households were interviewed via telephone

From the results from 295 interviewed households, it could confirm the following:

1. The usage of bio-slurry for farming activities or make into compost;
2. Living conditions improved with savings using the biogas for cooking;
3. Reduce usage of firewood and LPG;
4. A proper system to treat the animal manure;

Therefore, the sample size is representative based on the results obtained.

5.10. ER Calculation

During the verification mistakes in the ER calculation were identified. Corresponding CARs were raised. A revised ER calculation was prepared by the PP and presented to the verification team. All raised issues were addressed appropriately so that all

corresponding CARs could be closed out. Thus it is confirmed that the ER calculation is overall correct.

Baseline Emissions:

The baseline emissions have 2 components as follows:

1. Emissions from displacement of fossil fuels and non-renewable biomass fuel.

   These emissions are the comparing of fuel consumption in a project scenario to the baseline scenario according to the registered GS VPA-DD.

   In the baseline scenario the fossil fuel is LPG and kerosene whilst the non-renewable fuel is firewood.

   The equation applied:

   $\sum BE_{b1,CO2,y} = B_{b1,y} * ((f_{NRB,y} * EF_{b1,fuel,CO2}) + EF_{b1,fuel,nonCO2}) * NVC_{b1,fuel}$

   The inputs for the fuel usage data are derived from the KPT survey.

   Baseline emission for this component for both VPA-1 CPI is 1.825 $tCO_2e/y/hh$, VPA-1 CPII is 1.670 $tCO_2e/y/hh$ and VPA-2 is 1.825 $tCO_2e/y/hh$.

2. Emissions due to the avoidance of methane emissions from manure handling using the IPCC 2006 Tier 1 approach.

   The equation applied:

   $BE_{b1,CH4,y} = GWP_{CH4} * \sum_T (EF_{awms,T} * N_{T,h})$

   The inputs for the type of animals and average population of animals are from the usage survey.

   Baseline emission for this component for both VPA-1 CPI and VPA1- CPII is 4.549 $tCO_2e//y/hh$ and VPA-2 is 3.705 $tCO_2e/y/hh$.

Project Emissions:

The project emissions are contributed from:

1. Continued use of baseline scenario fossil fuel and firewood in the project scenario;

   The equation applied:

   $PE_{p1,CO2,y} = \Sigma (BB_{p1,fuel} * NCV_{fuel} * EF_{p1,fuel}) + (BB_{p1,bio} * NCV_{bio} * EF_{p1,fuel} * f_{NRB})$

   The inputs for the fuel usage data are derived from the KPT survey.

   Project emission for this situation for VPA-1 CPI is 0.926 $tCO_2e/y/hh$, CPA-1 CPII is 0.848 $tCO_2e/y/hh$ and VPA-2 is 0.926 $tCO_2e/y/hh$.

2. Physical leakage of biogas from the biodigester and incomplete combustion of biogas;

The equation applied:

$PE_{p1,CH4,y} = GWP_{CH4} * \sum (N_{T,h,y} * EF_{awms,T}) * PL_y + \sum (N_{T,h,y} * EF_{awms,T}) * (1- \eta_{new\ stove}) (1- PL_y) + PE_{awms,NT}$

The input for the type of animals and number of animals are from the usage survey.

The default value of 10% applied for physical leakage of biodigester.

The animal waste not treated in the bio-digester in the project scenario is consider as zero since the non-treated animals in the project scenario will have the same situation as they would have had in the baseline.

Project emission for this situation is 2.502 $tCO_2e/y/hh$ for VPA-1 CPI and CPII. VPA-2 is 2.037 $tCO_2e/y/hh$

3. Emissions from bio-slurry:

   In the ER spreadsheet, the CME has demonstrated the steps for the calculating the emissions for bio-slurry. The data applied in the calculation are derived from:

   1. 2006 IPCC default value for animal excretion amount, MCF and methane potential;
   2. The average head count of animals type are based on the usage survey results; /BUS/
   3. The digester efficiency is based on the study report and IPCC data; /O1/

   The calculated emission for bio-slurry is 0.018 $tCO_2e/y/hh$ for VPA-1 CPI and CPII whilst 0.042 $tCO_2e/y/hh$ for VPA-2.

Leakage:

The PP has conducted a leakage survey for this monitoring period and the calculated value is 0.037 $tCO_2e/y/hh$ for both VPA-I CPI and VPA-2 whilst 0.033 $tCO_2e/y/hh$ for VPA-1 CPII.

Emission Reduction:

The emission reduction for one household is calculated for this monitoring period as follows for both VPA-1 and VPA-2:

VPA-1 CPI

1. Emission reductions from fuel switch.

   $ER_{CO2,y} = BE_{b1,CO2,y} – PE_{p1,CO2,y} – LE_{p1,CO2,y}$

   $= 1.825 – 0.926 – 0.037$

   $= 0.862\ tCO_2e/y/hh$

2. Emission reductions from waste management.

$ER_{CH4,y}$ = $BE_{b1,CH4,y} – PE_{p1,CH4,y} – LE_{p1,CH4,y}$

= 4.549 – 2.502 – 0

= 2.047 $tCO_2e/y/hh$

3. Emissions from Bio-slurry for this monitoring period for both VPA-1 and VPA-2 is 0.018 $tCO_2e/y/hh$

Thus the ER for each household for this monitoring period:

ER_{Total} = $ER_{CO2,y} + ER_{CH4,y} - PE_{bio-slurry}$

= 0.862 + 2.047 – 0.018

= 2.891 $tCO_2e/y/hh$. (Rounded down to next integral)

Therefore, the cumulative emission reductions for MRVI CPI for this monitoring period are determined as below:

ER_{Total} = $(ER_{CO2,y} + ER_{CH4,y} - PE_{bio-slurry}) * N_{p1,y} * U_{p1,y}$

= **19,450 tCO_2e**

VPA-1 CPII:

1. Emission reductions from fuel switch.

$ER_{CO2,y}$ = $BE_{b1,CO2,y} – PE_{p1,CO2,y} – LE_{p1,CO2,y}$

= 1.670 – 0.848 – 0.033

= 0.788 $tCO_2e/y/hh$

2. Emission reductions from waste management.

$ER_{CH4,y}$ = $BE_{b1,CH4,y} – PE_{p1,CH4,y} – LE_{p1,CH4,y}$

= 4.549 – 2.502 – 0

= 2.047 $tCO_2e/y/hh$

3. Emissions from Bio-slurry for this monitoring period for both VPA-1 and VPA-2 is 0.018 $tCO_2e/y/hh$

Thus the ER for each household for this monitoring period:

ER_{Total} = $ER_{CO2,y} + ER_{CH4,y} - PE_{bio-slurry}$

= 0.788 + 2.047 – 0.018

= 2.817 $tCO_2e/y/hh$. (Rounded down to next integral)

Therefore, the cumulative emission reductions for MRI CPII this monitoring period are determined as below:

ER_{Total} = $(ER_{CO2,y} + ER_{CH4,y} - PE_{bio-slurry}) * N_{p1,y} * U_{p1,y}$

= **26,540 tCO_2e**

VPA-2:

1. Emission reductions from fuel switch.

$ER_{CO2,y}$ = $BE_{b1,CO2,y} – PE_{p1,CO2,y} – LE_{p1,CO2,y}$

= 1.825 – 0.926 – 0.037

= 0.862 $tCO_2e/y/hh$

2. Emission reductions from waste management.

$ER_{CH4,y}$ = $BE_{b1,CH4,y} – PE_{p1,CH4,y} – LE_{p1,CH4,y}$

= 3.705 – 2.037 – 0

= 1.668 $tCO_2e/y/hh$

3. Emissions from Bio-slurry for this monitoring period for both VPA-1 and VPA-2 is 0.042 $tCO_2e/y/hh$

Thus the ER for each household for this monitoring period:

ER_{Total} = $ER_{CO2,y} + ER_{CH4,y} - PE_{bio-slurry}$

= 0.862 + 1.668 – 0.042

= 2.487 $tCO_2e/y/hh$. (Rounded down to next integral)

Therefore, the cumulative emission reductions for MRII CPI this monitoring period are determined as below:

ER_{Total} = $(ER_{CO2,y} + ER_{CH4,y} - PE_{bio-slurry}) * N_{p1,y} * U_{p1,y}$

= **5,273 tCO_2e**

To be conservative, the baseline emissions are rounded down to the integer and project emissions are rounded-up to the next integer.

To conclude, from the reviewed and replication of data input to the ER calculation, it can be confirmed the data stated in the MR is overall correct.

VPA-1: Refer CC C-1, CAR C-7, CAR C-8, CAR C-9, CAR C-10, CAR C-11 and CAR C-12 raised and closed out.

VPA-2: Refer CAR C-7, CAR C-8, CAR C-9 and CAR C-10 raised and closed out.

5.11. Quality Management

Quality Management procedures for measurements, collection and compilation of data, data storage and archiving, calibration, maintenance and training of personnel in the framework of this GS PoA-DD have been defined. The procedures defined can be assessed as appropriate for the purpose. No significant deviations thereof have been observed during the verification.

5.12. Actual emission reductions during the 2nd commitment period as from 1 January 2013 onwards

The MR(s) include(s) actual ER values achieved from 1 January 2013 onwards as follows:

Table 5-2: Emission reductions after 01/01/2013

VPA	Monitoring Period[1)]	ERs (tCO_2e)
VPA-1 CPI	01/01/2018 to 31/05/2018	19,450
VPA-1 CPII	01/06/2018 to 31/12/2018	26,540
VPA-2	01/01/2018 to 31/12/2018	5,273
Total		51,263

5.13. Comparison with ex-ante estimated emission reductions

The MR includes a comparison of the calculated actual emission reductions with the ex-ante calculated values in the registered VPA-DD.

VPA	**Ex-Ante ERs**	**EX Post ERs**	**Difference**
VPA-1 CPI	8,698 tCO_2e	19,454 tCO_2e	10,752 tCO_2e
VPA-1 CPII	37,337 tCO_2e	26,540 tCO_2e	10,797 tCO_2e
VPA-2	10,836 tCO_2e	5,273 tCO_2e	5,563 tCO_2e

VPA-1:

The ex-post value is found to be higher than the ex-ante determined value. The reason for the increase as follows:

1. The number of installed units applied in the ex-ante ER calculation was 7,983 as compared to 20,253 units for this monitoring period.
2. Higher substitution of biomass and fossil fuel with increase in biogas usage.
3. The GWP for methane potential applied in the registered VPA-DD was 21 for CPI whilst 25 is applied for this monitoring period.

Therefore, the increased in ER for this monitoring period is comprehensible.

The annual emissions for methane avoidance for this monitoring period are approx. 41,089 tCO_2e which is still below the 60,000 tCO_2e threshold for Type III small scale project activities.

The total installed thermal energy generation capacity of the project equipment for this monitoring period is 38.74 MW_{th} which is below the threshold of 45MW_{th} for Type I small scale project activities.

VPA-2:

The ex-post value is found to be lower than the ex-ante determined value. The reason for the decrease as follows:

The number of installed units applied in the ex-ante ER calculation was 6,000 as compared to 3,450 units for this monitoring period.

Higher substitution of biomass and fossil fuel with increase in biogas usage.

5.14. Contribution to Sustainable Development

The SD indicators as outlined in the sustainability monitoring plan of the GS PoA Passport are monitored and reported appropriately and cross-verified by means of desk review of survey reports, interviews with the CME operation personnel and selected households. The monitoring system and all applied procedures are in compliance to the sustainability monitoring plan in the registered GS VPA-DD and the Gold Standard principles.

Table 5-1: Assessment of monitored SD Indicators

VPA1:

No	Indicator	Chosen Parameter	Situation as at 31/12/2018	Verification Opinion
GS-03	Soil Condition	Number of users applying the final bio-digester slurry on agricultural land.	10,981households	The usage survey reported 54% of the households apply bio-slurry for the farming activities. /BUS/ During the onsite inspection and telephone interviews it could be confirmed that 60% of the households apply bio-slurry for farming activities which substantiates the results of the usage survey. /LHH/
GS-06	Quality of employment	Quality of employment refers to changes compared to the baseline in the qualitative value of employment, such as whether the jobs resulting from the project activity are highly or poorly qualified, temporary or permanent. The proportion of employees attending vocational training programs, as proven through issuance of a certificate to all constructors, will be monitored.	1,382 vocational trainings	The value was based on the records in the database on training conducted for this monitoring period. /VAP1DB/ During the onsite visits, the provincial officers, technicians, supervisors and householders were interviewed to crosschecked on the training conducted. Based on that the value could be confirmed.
GS-07	Livelihood of the poor	Livelihood of the poor refers to changes compared to the baseline in living conditions, access to healthcare services including affordability and poverty alleviation. To indicate improvement, as part of the Biogas User Survey users will be asked whether they have perceived an improvement in	Improved: 16,336 HHs (81%) The same: 3,917 HHs (19%) Worsened: 0 HHs (0%)	The data is derived from the usage survey report. /BUS/ During the onsite visit, the visited households confirmed the living conditions have improved as follows: 1. The biodigester has reduced the manure smell and disposal of untreated manure.

No	Indicator	Chosen Parameter	Situation as at 31/12/2018	Verification Opinion
		their living conditions after the installation of the biodigester		2. They have free cooking gas and reduce the purchase of LPG. Thus reduced the household expenses.
GS-08	Access to affordable and clean energy services	Access to energy services refer to changes in unsustainable energy use. This will be monitored through the number of biogas units commissioned.	20,253 biodigesters implemented	The number of biodigesters installed as at 31/12/2016 was derived from the database stored at the Jakarta office. /VPPA1DB/ During the onsite, the database was cross-checked to confirm the actual number of units implemented.
GS-09	Human and institutional capacity	Changes compared to the baseline in education and skills, gender equality and empowerment. Women spend much of their time collecting firewood and cooking, and have little spare time to undertake activities that stimulate personal and entrepreneurial development. The number of women attending the Operation and Maintenance training as well as the bio-slurry utilization training will be monitored.	4,050 women attending O&M training	The number of household women attended the O&M training was recorded in the database. /VPA1DB/ During the onsite inspection, the visited households could confirm O&M training for the bio-digester is provided by the provincial technical team regularly. /LHH/IM06/IM03/
GS-10	Quantitative employment and income generation	The number of jobs generated by within the IDBP as well as the number of constructors employed will be monitored. To evidence income generation, the amount of users selling biodigester slurry on the market will be monitored.	1,509 number of direct jobs created by the project 607 households 3.0% of total) sell the bio-slurry on the market	The database was reviewed to cross-checked on the number of direct jobs and constructors created by the VPA. /VAP1DB/IM01/IM06/ The percentage of households sell bio-slurry was derived from the usage survey. The report was reviewed to cross-checked on the reported percentage of households sell bio-slurry. /BUS/
GS-12	Technology transfer and technological self-reliance	Refers to changes compared to the baseline in activities that build usable and sustainable know-how in a region / country for a technology, where know-how was previously lacking. The number of constructors trained and users attending the operation and maintenance training will be monitored	14,530 O&M training	The training records in the database were reviewed during onsite and could conclude the O&M trainings attended by the households and constructor supervisors. The households and supervisor was interviewed during onsite visit. /LHH/IM04/IM06/

The verification team can confirm that no changes to the registered SD parameters have occured that may have an impact on Gold Standard qualification of this project activity.

VPA2:

No	Indicator	Chosen Parameter	Situation as at 31/12/2018	Verification Opinion
GS-03	Soil Condition	Number of users applying the final bio-digester slurry on agricultural land.	2,208 households	The usage survey reported 64% of the households apply bio-slurry for the farming activities. /BUS/ During the onsite inspection and telephone interviews it could be confirmed that 62% of the households apply bio-slurry for farming activities as compared to the results of the usage survey. /LHH
GS-06	Quality of employment	Quality of employment refers to changes compared to the baseline in the qualitative value of employment, such as whether the jobs resulting from the project activity are highly or poorly qualified, temporary or permanent. The proportion of employees attending vocational training programs, as proven through issuance of a certificate to all constructors, will be monitored.	51 vocational trainings	The value was based on the records in the database on training conducted for this monitoring period. /VPA2DB/ During the onsite visits, the provincial officers and supervisors were interviewed to cross-checked on the training conducted. Based on that the value could be confirmed. /IM04/
GS-07	Livelihood of the poor	Livelihood of the poor refers to changes compared to the baseline in living conditions, access to healthcare services including affordability and poverty alleviation. To indicate improvement, as part of the Biogas User Survey users will be asked whether they have perceived an improvement in their living conditions after the installation of the biodigester	Improved: 2,721 HHs (81%) The same: 729 HHs (19) Worsened: 0 HHs (0%)	The data is derived from the usage survey report. /BUS/ During the onsite visit, the visited households confirmed the living conditions have improved as follows: 1. The biodigester has reduced the manure smell and disposal of untreated manure. 2. They have free cooking gas and reduce the purchase of LPG. Thus reduced the household expenses.
GS-08	Access to affordable and clean energy services	Access to energy services refer to changes in unsustainable energy use. This will be monitored through the number of biogas units commissioned.	3,450 biodigesters implemented	The number of biodigesters installed as at 31/12/2018 was derived from the database stored at the Jakarta office. /VAP2DB/ During the onsite, the database was checked. The data officer and provincial officers were interviewed on the data submitted for the number of units installed. /IM01/
GS-09	Human and institutional capacity	Changes compared to the baseline in education and skills, gender equality and empowerment. Women spend much of their time collecting firewood and cooking, and have little spare time to undertake activities that stimulate personal and	774 women attending O&M training	The number of household women attended the O&M training was recorded in the database. /VAP2DB/ During the onsite inspection, the visited households could confirm O&M training for the biodigester is provided by the provincial technical team regularly. /LHH/IM04/IM01/IM04/IM06

No	Indicator	Chosen Parameter	Situation as at 31/12/2018	Verification Opinion
		entrepreneurial development. The number of women attending the Operation and Maintenance training as well as the bio-slurry utilization training will be monitored.		
GS-10	Quantitative employment and income generation	The number of jobs generated by within the IDBP as well as the number of constructors employed will be monitored. To evidence income generation, the amount of users selling biodigester slurry on the market will be monitored.	58 number of direct jobs created by the project **7** number of constructors employed.0 households 0 % of total sell the bio-slurry on the market	The database was reviewed to cross-checked on the number of direct jobs and constructors created by the VPA. /VPA2DD/ The percentage of households sell bio-slurry was derived from the usage survey. The report was reviewed to cross-checked on the reported percentage of households sell bio-slurry. /BUS/
GS-12	Technology transfer and technological self-reliance	Refers to changes compared to the baseline in activities that build usable and sustainable know-how in a region / country for a technology, where know-how was previously lacking. The number of constructors trained and users attending the operation and maintenance training will be monitored	3,235 O&M training	The training records in the database were reviewed during onsite and could conclude the O&M trainings attended by the households and constructor supervisor. /VPA2DB/ The households and supervisor was interviewed during onsite visit. /IM04/LHH/

The verification team can confirm that no changes to the registered SD parameters have occured that may have an impact on Gold Standard qualification of this project activity.

VPA-2: Refer CAR D-1, CAR D-2 and CAR D-3 raised and closed out

5.15. Overall Aspects of the Verification

All necessary and requested documentation was provided by the project participants so that a complete verification of all relevant issues could be carried out.

Access was granted to all installed households which are relevant for the project performance and the monitoring activities.

The verification team has checked on the agreement between the PP and householders for the construction of the biodigester signed between householder (Party A) and PP (Party B) joining the program was verified the include the below statement. /A1/

Party A agreed to give up the right to the use the carbon emission reductions to HIVOS the organiser of IDPB program and use it for the Indonesia Domestic Biogas Programme.

No issues have been identified indicating that the implementation of the project activity and the steps to claim emission reductions are compliant with the GS requirements.

5.16. Grievances

The PoA applies GS version 2.1, therefore there is no requirements on reporting of any grievances raised by local stakeholders.

The verification team has interviewed the operational personnel, reviewed the survey report and there are no complaints and grievances raised by the householders.

The verification team has interviewed the householders during the onsite inspection and there were no complaints as regards to the CME personnel and the constructors.

The households are satisfied having installed a biodigester to have free cooking gas and thus have savings in fuel costs.

5.17. Hints for next periodic Verification

No FAR has been raised during this fourth periodic verification.

6. VERIFICATION AND CERTIFICATION STATEMENT

HIVOS Netherlands has commissioned the TÜV NORD JI/CDM Certification Program to carry out the VPA-1 MR6 CPI, MR1 CPII and VPA-2 MR2 CPI periodic verification of the PoA: "**Indonesia Domestic Biogas Programme of Activities (IDBP) (ID 1172)**", with regard to the relevant requirements for GS project activities. The PoA reduces GHG emissions due to displacement of non-renewable cooking fuel with biogas, avoidance of methane emission from animal manure by capturing and destroying methane for thermal energy use and displacement of chemical fertilizers by the bio-slurry. This verification covers the emission reductions achieved by all the VPAs in its corresponding monitoring periods:

VPA No.	*Monitoring period (MP):*	
	From:	*To:*
1 - CPI	01/01/2018	31/05/2018
1 - CPII	01/06/2018	31/12/2018
2 - CPI	01/01/2018	31/12/2018

In the course of the verification 16 Corrective Action Requests (CAR) and 4 Clarifications for VPA-1 and 12 Corrective Action requests (CAR) and 3 Clarifications for VPA-2 were raised and successfully closed. The verification is based on the draft monitoring report(s), revised monitoring report(s), the monitoring plan as set out in the registered VPA-DD(s), the validation report, emission reduction calculation spreadsheet and supporting documents made available to the TÜV NORD JI/CDM CP by the project participant.

As a result of this verification, the verifier confirms that:

- all operations of the project are implemented and installed as planned and described in the validated project design document.
- the monitoring plan is in accordance with the applied approved CDM methodology.
- the installed equipment essential for measuring parameters required for calculating emission reductions are calibrated appropriately.
- the monitoring system is in place and functional. The project has generated GHG emission reductions.
- the project contributes to sustainability development

As the result of this periodic verification for VPA-1 CPI MPVI, VPA-1 CPII MPI and VPA-2 CPI MPII, the verifier confirms that the GHG emission reductions are calculated without material misstatements in a conservative and appropriate manner. TÜV NORD JI/CDM CP herewith confirms that the PoA has achieved emission reductions in the above mentioned reporting period as follows:

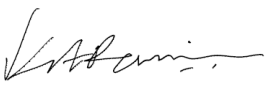
Emission reductions:

VPA-1 CPI	**19,454 tCO_2e**
VPA-1 CPII	**26,540 tCO_2e**
VPA-2 CPI	**5,190 tCO_2e**

Puchong, 30//09/2019

Cheong, Chun Yuen (Robert)

Essen, 30/09/2019



TÜV NORD JI/CDM Certification Program

TÜV NORD JI/CDM Certification Program Verification Team Leader	Final Approval

7. REFERENCES

Table 7-1: Documents provided by the project participant(s)

Reference	Document
Monitoring Report	
/MRVPA1/	Monitoring Report version 0.1 dated 20/02/2019 Monitoring Report version 0.2 dated 12/04/2019 Monitoring Report version 0.3 dated 17/06/2019 Monitoring Report version 0.4 dated 20/06/2019 Monitoring Report version 0.5 dated 28/07/2019 Monitoring Report version 0.6 dated 19/09/2019
/MRVPA2/	Monitoring Report version 0.1 dated 20/02/2019 Monitoring Report version 0.2 dated 06/05/2019 Monitoring Report version 0.3 dated 17/06/2019 Monitoring Report version 0.4 dated 20/06/2019 Monitoring Report version 0.5 dated 27/08/2019 Monitoring Report version 0.6 dated 30/09/2019
ER Spreadsheet	
/ERVPA1/	ER spreadsheet version 0.1 dated 28/02/2019 ER spreadsheet version 0.2 dated 12/04/2019 ER spreadsheet version 0.3 dated 17/06/2019 ER spreadsheet version 0.4 dated 28/07/2019
/ERVPA2/	ER spreadsheet version 0.1 dated 28/02/2019 ER spreadsheet version 0.2 dated 06/05/2019 ER spreadsheet version 0.3 dated 27/08/2019
Calibration	
/C1/	Calibration for 500gm and 1,000gm weights conducted by Balai Pengelola Laboratorium Metrologi dated 24/095/2016 Scale calibration form dated 23/09/2013 Calibration method dated 23/09/2013
Database	
/VPA1DB/	IDBP 2018 project database version 1 IDBP 2018 project database version 2
/VPA2DB/	IDBP 2018 project database version 1 IDBP 2018 project database version 2
Leakage	

Reference	Document
/L1/	Leakage assessment report dated December 2017 Email for Leakage Assessment confirmation dated 18/05/2016
Kitchen Performance Test	
/KPT/	KPT December 2017 KPT Biogas and Non-biogas users form
Biogas Usage Survey	
/BUS/	Biogas Usage Survey 2019 BUS Survey 2019 Tabulation JRI
Agreement	
/A1/	Sample agreement with households for year 2018 for VPA-2 Sample agreement (translated)
Technical Design	
/TD1/	Technical Design of digesters undated
QA/QC	
/QA1/	Operation and Maintenance Manual
Others	
/O1/	Biogas as renewable energy theory and development Nepal 2005-07
/O2/	Indonesian National Standard on LGP Stoves
/O3/	Kerosene to LP Gas Conversion Programme in Indonesia
/O4/	Behaviour Analysis of Using the Household Fuel in Bogor 2010
/O5/	IPCC Chapter 10 on Livestock emissions
/O6/	Memo Perbaikan Reaktor
/O7/	Gold Standard email communication threshold small-scale biogas VPA
/O8/	Monitoring Method for Monitoring Survey; Usage Survey and Leakage assessment with GS undated

Table 7-2: Background investigation and assessment documents

Reference	Document
/CPM/	TÜV NORD JI / CDM CP Manual (incl. CP procedures and forms)
/ER/	ER Calculation VPA 1 CP2 v.0.4 dated 02/07/2018
/GSGWP/	The Application of Global Warming Potentials for Gold Standard Project Activities
/GSM/	Technologies and practices to displace decentralized thermal energy consumption, version 1.0 (TPDDTEC)
/GSPPoA/	PoA Gold Standard Passport dated 203/04/2013
/GSPVPA1/	VPA1 Gold Standard Passport dated 03/04/2013
/GSPVPA2/	VPA2 Gold Standard Passport version 1.0 dated 14/10/2014
/GSR/	Gold Standard Requirements version 2.1
/GSS/	Guidelines for Sampling and Surveys for CDM Project Activities and Programme Of Activities, EB 69, Annex 5
/GST/	Gold Standard Toolkit version 2.1
/IPCC/	Good Practice Guidance and Uncertainty Management in National Greenhouse Gas Inventories: 1. Non-CO_2 Stationery Combustion 2. Emissions from Livestock and Manure Management (Chapter 10) 3. IPCC Second Assessment Report – Climate Change 1995: A Report of the Intergovernmental Panel on Climate Change
/KP/	Kyoto Protocol (1997)
/MA/	Decision 3/CMP. 1 (Marrakesh – Accords)
/GSPoADD/	GS Programme of Activities Design Document for GS PoA project: “Indonesia Domestic Biogas Programme of Activities (IDBP) (ID 1172)” version 5.0, dated 13/12/2013
/PS/	CDM Project Standard (Version 02.0)
/SSS/	Standard for Sampling and Surveys for CDM Project Activities and Programme Of Activities, EB 86, Annex 3

/VAL/	Validation Report for GS project "Indonesia Domestic Biogas Programme of Activities (IDBP) (ID 1172)" version 01.8 dated 03/12/2013 Validation Report for GS project "Indonesia Domestic Biogas Programme of Activities (IDBP) (ID 1172)" version 1.0 dated 03/07/2018 Validation Report for GS project "Indonesia Domestic Biogas Programme of Activities (IDBP) VPA-2 (GS 5303)" version 01.3 dated 04/07/2017
/VER/	Documents of previous verification (Monitoring report, verification report, ER calculation sheet)
/VPA1DD/	Component Project Activity Design Document for GS VPA-DD: Indonesia Domestic Biogas Programme of Activities (IDBP) (ID 1172), VPA-1 (ID 1174), version 7, dated 06/11/2013 Component Project Activity Design Document for GS VPA-DD: Indonesia Domestic Biogas Programme of Activities (IDBP) (ID 1172), VPA-1 (ID 1174), version 10, dated 28/05/2018
/VPA2DD/	Component Project Activity Design Document for GS VPA-DD: Indonesia Domestic Biogas Programme of Activities (IDBP) (ID 1172), VPA-2 (GS 5303), version 1.3, dated 03/07/2017
/VVS/	CDM Validation and Verification Standard (Version 02.0)

Table 7-3: Websites used

Reference	Link	Organisation
/gs/	http://www.goldstandard.org/	CDM Gold Standard
/unfccc/	http://cdm.unfccc.int	UNFCCC
/ipcc/	www.ipcc-nggip.iges.or.jp	IPCC publications
/ss/	http://www.raosoft.com/samplesize.html	Sampling Size

Table 7-4: List of interviewed persons

Reference	MoI[1]		Name	Organisation / Function
/IM01/	V	☒ Mr. ☐ Ms	Agung Lenggono	Project Manager / Yayasan Rumah Energi
		☐ Mr. ☒ Ms	Chabi Batur Romzini (Bibah)	Senior Database Officer / Yayasan Rumah Energi

Reference	MoI[1]		Name	Organisation / Function
		☐ Mr. ☒ Ms	Lina Moeis	Executive Director / Yayasan Rumah Energi
		☒ Mr. ☐ Ms	Dian Legowo	Database officer / Yayasan Rumah Energi
/IM02/		☐ Mr. ☒ Ms	Laily Himayati	Project Manager Green Energy / HIVOS
/IM03/		☒ Mr. ☐ Ms	Slamet Basuki	Biogas Quality Inspector / Yayasan Rumah Energi - Solo
		☒ Mr. ☐ Ms	Henu Saputra	Qulity Inspector / Yayasan Rumah Energi - Lampung
/IM04/	T	☒ Mr. ☐ Ms	Szymon Mikolajczyk	Consultant / Climate Focus
/IM05/	V	☐ Mr. ☒ Ms	Rita Maria	Director / JRI Research
/IM06/	V	☒ Mr. ☐ Ms	Irpan	Supervisor / Regol Mason Group CPO
	V	☒ Mr. ☐ Ms	Lilik	Supervisor/ LPTP CPO

List of households visited: /LHH/

VPA-1

No.	MoI[1]	Biodigester Number	Household Name	Location (Village, Subdistrict, District, Province)
1	V	RGP0011	Suprayit	Sangun Ratu, Pubian, Lampung Tengah, Lampung
2	V	RGP0004	Sarlan	Sangun Ratu, Pubian, Lampung Tengah, Lampung
3	V	RGP0024	DPK Bejo	Sangun Ratu, Pubian, Lampung Tengah, Lampung
4	V	RGP0028	DPK Kartam	Sangun Ratu, Pubian, Lampung Tengah, Lampung

No.	MoI[1]	Biodigester Number	Household Name	Location (Village, Subdistrict, District, Province)
5	V	RGP0010	SupriyadI	Sangun Ratu, Pubian, Lampung Tengah, Lampung
6	V	RGP0079	Sarimin	Sangun Ratu, Pubian, Lampung Tengah, Lampung
7	V	RGP0087	Suratmin	Sangun Ratu, Pubian, Lampung Tengah, Lampung
8	V	RGP0093	Sukemi	Sangun Ratu, Pubian, Lampung Tengah, Lampung
9	V	RGP0020	Abdul Rohim	Sangun Ratu, Pubian, Lampung Tengah, Lampung
10	V	RGP0051	Toyib Usman	Sangun Ratu, Pubian, Lampung Tengah, Lampung
11	V	RGP0032	Sudarsono	Sangun Ratu, Pubian, Lampung Tengah, Lampung
12	V	RGP0022	Ajin	Sangun Ratu, Pubian, Lampung Tengah, Lampung
13	V	RGP0031	Rokayah	Sangun Ratu, Pubian, Lampung Tengah, Lampung
14	V	RGP0023	Ardi Sulaiman	Sangun Ratu, Pubian, Lampung Tengah, Lampung
15	V	RGP0069	Sholeh Sungaidi	Sangun Ratu, Pubian, Lampung Tengah, Lampung
16	V	RGP0109	Muhammad Juhri	Sangun Ratu, Pubian, Lampung Tengah, Lampung
17	V	RGP0101	Parjan	Sangun Ratu, Pubian, Lampung Tengah, Lampung
18	V	RGP0092	Sumanto	Sangun Ratu, Pubian, Lampung Tengah, Lampung
19	V	RGP0084	Wahyudi Nata	Sangun Ratu, Pubian, Lampung Tengah, Lampung

No.	MoI[1]	Biodigester Number	Household Name	Location (Village, Subdistrict, District, Province)
20	V	RGP0077	Puji Waluyo	Sangun Ratu, Pubian, Lampung Tengah, Lampung
21	V	RGP0105	Narto	Sangun Ratu, Pubian, Lampung Tengah, Lampung
22	V	RGP0054	Tusiman	Sangun Ratu, Pubian, Lampung Tengah, Lampung
23	V	RGP0003	Sahli	Sangun Ratu, Pubian, Lampung Tengah, Lampung
24	V	RGP0006	Sugiono	Sangun Ratu, Pubian, Lampung Tengah, Lampung
25	V	RGP0005	Kaswan	Sangun Ratu, Pubian, Lampung Tengah, Lampung
26	V	RGP0096	Yasman	Sangun Ratu, Pubian, Lampung Tengah, Lampung
27	V	RGP0095	Rasimin (Satu)	Sangun Ratu, Pubian, Lampung Tengah, Lampung
28	V	RGP0099	Slamet Sriyono	Sangun Ratu, Pubian, Lampung Tengah, Lampung
29	V	RGP0081	Purnomo	Sangun Ratu, Pubian, Lampung Tengah, Lampung
30	V	RGP0105	Nur Majid	Sangun Ratu, Pubian, Lampung Tengah, Lampung
31		LPP0279	Suyatmo	Mundu, Tulung, Klaten Jawa Tengah
32		LPP0298	Eko Sumasto	Mundu, Tulung, Klaten Jawa Tengah
33		LPP0310	Mujiman Nantowiyono	Mundu, Tulung, Klaten Jawa Tengah
34		LPP0363	Marjito Marno Suwito	Mundu, Tulung, Klaten Jawa Tengah
35		LPP0375	Sri Umum	Mundu, Tulung, Klaten Jawa Tengah

No.	MoI[1]	Biodigester Number	Household Name	Location (Village, Subdistrict, District, Province)
36		LPP0318	Sunaryo	Mundu, Tulung, Klaten Jawa Tengah
37		LPP0325	Sukirman Warno Miharjo	Mundu, Tulung, Klaten Jawa Tengah
38		LPP0331	Sulomo	Mundu, Tulung, Klaten Jawa Tengah
39		LPP0332	Sugiyono	Mundu, Tulung, Klaten Jawa Tengah
40		LPP0348	Suranto	Mundu, Tulung, Klaten Jawa Tengah
41		LPP0347	Ngateno	Mundu, Tulung, Klaten Jawa Tengah
42		LPP0358	Sarno Sarwo Utomo	Mundu, Tulung, Klaten Jawa Tengah
43		LPP0350	Tukino Harno Widodo	Mundu, Tulung, Klaten Jawa Tengah
44		LPP0352	Wiyono Yatno Sumarno	Mundu, Tulung, Klaten Jawa Tengah
45		LPP0353	Tukiran Ranto Mulyono	Mundu, Tulung, Klaten Jawa Tengah
46		LPP0359	Supriyana	Mundu, Tulung, Klaten Jawa Tengah
47		LPP0360	Sumadi Dirjo Utomo	Mundu, Tulung, Klaten Jawa Tengah
48		LPP0422	Rizal Susanto	Sukorejo, Sambirejo, Sragen, Jawa Tengah
49		LPP0414	Suwarno	Sukorejo, Sambirejo, Sragen, Jawa Tengah
50		LPP0416	Anton	Sukorejo, Sambirejo, Sragen, Jawa Tengah
51		LPP0418	Supadi	Sukorejo, Sambirejo, Sragen, Jawa Tengah
52		LPP0417	Parmono	Sukorejo, Sambirejo, Sragen, Jawa Tengah

VPA-2:

No.	MoI[1]	Biodigester Number	Household Name	Location (Village, Subdistrict, District, Province)
1	V	RGP0061	Iswoyo	Sangun Ratu, Pubian, Lampung Tengah, Lampung
2	V	RGP0057	Darsimun	Sangun Ratu, Pubian, Lampung Tengah, Lampung
3	V	LPP0432	Sunarti	Mundu, Tulung, Klaten, Jawa Tengah
4	V	LPP0426	Sri Sutardi	Sukorejo, Sambirejo, Sragen, Jawa Tengah
5	V	LPP0429	Gunarto	Sukorejo, Sambirejo, Sragen, Jawa Tengah
6	V	LPP0431	Triyono	Sukorejo, Sambirejo, Sragen, Jawa Tengah
7	V	LPP0428	Madi	Sukorejo, Sambirejo, Sragen, Jawa Tengah
8	V	LPP0430	Gimanto Alhermanto	Sukorejo, Sambirejo, Sragen, Jawa Tengah
9	V	LPP0425	Herman	Sukorejo, Sambirejo, Sragen, Jawa Tengah
10	V	LPP0446	Setyo Sumanto	Sukorejo, Sambirejo, Sragen, Jawa Tengah
11	V	LPP0444	Sadi	Sukorejo, Sambirejo, Sragen, Jawa Tengah
12	V	LPP0448	Paiman	Sukorejo, Sambirejo, Sragen, Jawa Tengah
13	V	LPP0451	Purwanto	Sukorejo, Sambirejo, Sragen, Jawa Tengah
14	V	LPP0443	Dusir	Sukorejo, Sambirejo, Sragen, Jawa Tengah
15	V	LPP0445	Slamet Riyadi	Sukorejo, Sambirejo, Sragen, Jawa Tengah
16	V	LPP0447	Sutejo	Sukorejo, Sambirejo, Sragen, Jawa Tengah
17	V	LPP0450	Sukrisno	Sukorejo, Sambirejo, Sragen, Jawa Tengah
18	V	LPP0452	Imam Supangat	Sukorejo, Sambirejo, Sragen, Jawa Tengah
19	V	LPP0453	Kardi	Sukorejo, Sambirejo, Sragen, Jawa Tengah
20	V	LPP0455	Suparno	Sukorejo, Sambirejo, Sragen, Jawa Tengah
21	V	LPP0454	Wiyono	Sukorejo, Sambirejo, Sragen, Jawa Tengah

No.	MoI[1]	Biodigester Number	Household Name	Location (Village, Subdistrict, District, Province)
22	V	LPP0449	Sutar	Sukorejo, Sambirejo, Sragen, Jawa Tengah
23	V	LPP0427	Sugino	Sukorejo, Sambirejo, Sragen, Jawa Tengah
24	V	LPP0433	Kiman Siswanto	Sukorejo, Sambirejo, Sragen, Jawa Tengah
25	V	LPP0412	Paiman	Sukorejo, Sambirejo, Sragen, Jawa Tengah
26	V	LPP0420	Ribut Sujayanto	Sukorejo, Sambirejo, Sragen, Jawa Tengah
27	V	ONP0145	Sunar	Jemowo, Musuk, Boyolali, Jawa Tengah
28	V	ONP0147	Slamet Risyanto	Jemowo, Musuk, Boyolali, Jawa Tengah
29	V	ONP0155	Samsuri, CSR Amat	Jemowo, Musuk, Boyolali, Jawa Tengah
30	V	ONP0161	Tanto	Jemowo, Musuk, Boyolali, Jawa Tengah
31	V	ONP0163	Sarno	Jemowo, Musuk, Boyolali, Jawa Tengah
32	V	ONP0162	Sutomo	Jemowo, Musuk, Boyolali, Jawa Tengah

List of households interviewed by telephone calls:/LHH/

VPA-1:

No.	MoI[1]	Biodigester Number	Household Name	Location (Village, Sub-District, District, Province)
1	T	BOP0001	I Made Suarjana	Kerta, Payangan, Gianyar, Bali
2	T	BOP0058	Nengah Suendra	Selemadeg Barat, Selemadeg Barat, Tabanan, Bali
3	T	ADP0024	Wayan Dapur/Wayan Warsa	Pesinggahan, Dawan, Klungkung, Bali
4	T	ADP0003	I Nengah Nurita	Bajing, Tegak, Klungkung, BaliI
5	T	MKP0138	I Made Kadet Baskara	Sibangkaja, Abiansemal, Badung, Bali
6	T	MKP0166	I Wayan Mager	Sulangai, Petang, Badung, Bali

No.	MoI[1]	Biodigester Number	Household Name	Location (Village, Sub-District, District, Province)
7	T	SHP0001	Jenarto	Glagaharjo, Cangkringan, Sleman, DJ Yogyakarta
8	T	SHP0075	Imam Harowi	Donotirto, Kretek, Bantul, D.I. Yogyakarta
9	T	BMP0023	Tukijo	Srimartani, Piyungan, Bantul, D.I. Yogyakarta
10	T	PBP0085	Adi	Tirtomulyo, Kretek, Bantul, D.I. Yogyakarta
11	T	QAP0001	Budi Santoso	Jogotirto, Berbah, Sleman, D.I. Yogyakarta
12	T	SUP0062	Rujita	Gadingharjo, Sanden, Bantul, D.I. Yogyakarta
13	T	PBP0563	Sawiyo Hadi Siswanto	Murtigading, Sanden, Bantul, D.I. Yogyakarta
14	T	Epp0037	Oneng	Kertawangi, Cisarua, Bandung Barat, West Java
15	T	Kbp0066	Yaya bin wasta	Cibodas, Lembang, Bandung Barat, West Java
16	T	Wpp0012	Nunik sudarmoko	Cigugur, Cigugur, Kuningan, West Java
17	T	Kbp0156	Odih suheda	Mekarwangi, Lembang, Bandung Barat, West Java
18	T	Kbp0893	Nanda bin malik	Kertawangi, Cisarua, Bandung Barat, West Java
19	T	Epp0144	Riki dede permana	Jayagiri, Lembang, Bandung Barat, West Java
20	T	Kip0001	Junen	Cipari, Cigugur, Kuningan, West Java
21	T	LPP0034	Noto Kabul	Seruni, Musuk, Boyolali, Central Java
22	T	QTP0016	Sukardi	Kopeng, Getasan, Semarang, Central Java
23	T	BLP0010	Prayitno	Kramat, Krajan / penawangan, Grobogan,, Central Java
24	T	RMP0124	Samingan	Trengguli, Jenawi, Karanganyar, Central Java
25	T	TKP0071	Suroto	Lembu, Bancak, Semarang, Central Java

No.	MoI[1]	Biodigester Number	Household Name	Location (Village, Sub-District, District, Province)
26	T	BYP0082	Didik setiawan	Margotuhu Kidul, Margoyoso, Pati, Central Java
27	T	HPP0001	Samijan	Sempu, Andong, Boyolali, Central Java
28	T	KJP0019	Muji Rejeki	Slamparejo, Jabung, Malang, East Java
29	T	DJP0014	Naim	Pucang Sari, Purwodadi, Pasuruan, East Java
30	T	KPP0046	Suparno	Pandantoyo, Ngancar, Kediri, East Java
31	T	KSP0020	Sutoyo	Ngaringan, Gandusari, Blitar, East Java
32	T	NGP0050	Meseran Yulianto	Jombok, Ngantang, Malang, East Java
33	T	SJP0003	Sunarto	Padangan, Kayenkidul, Kediri, East Java
34	T	SKP0051	Jayus	Tutur, Tutur, Pasuruan, East Java
35	T	SKP0055	Sukarwan	Gendro, Tutur, Pasuruan, East Java
36	T	SMP0010	Haliman	Mulyorejo Medowo, Kandangan, Kediri, East Java
37	T	SMP0084	Junaidi	Ringinagung Medowo, Kandangan, Kediri, East Java
38	T	TMP0050	Seneli	Kandangtepus, Senduro, Lumajang, East Java
39	T	DJP0049	Karto	Sekar Mojo, Purwosari, Pasuruan, East Java
40	T	KJP0145	Tumari	Kemiri, Jabung, Malang, East Java
41	T	KPP0238	Purwanti	Babadan, Ngancar, Kediri, East Java
42	T	NGP0315	Supi'i	Sidodadi, Ngantang, Malang, East Java
43	T	ABP0059	Jangkung	Pudak Kulon, Pudak, Ponorogo, East Java
44	T	BDP0034	Dukut	Tugu, Rejotangan, Rejotangan, East Java
45	T	KPP0346	Joni	Ngancar, Ngancar, Kediri, East Java
46	T	KSP0202	Wasito	Krisik, Gandusari, Blitar, East Java

No.	MoI[1]	Biodigester Number	Household Name	Location (Village, Sub-District, District, Province)
47	T	SKP0769	Basori	Pungging, Tutur, Pasuruan, East Java
48	T	ABP0150	Sumilah	Ciluk, Kauman, Ponorogo, East Java
49	T	KTP0093	Suwandi	Rejoyoso, Bantur, Malang, East Java
50	T	skp0782	Sanusi	Puspo, Puspo, Pasuruan, East Java
51	T	Spp1101	Suwoko	Ngabab, Pujon, Malang, East Java
52	T	SWP0028	Yatin	Penjor, Pagerwojo, Tulungagung, East Java
53	T	JAP0028	M. Rofik	Bendosari, Sanankulon, Blitar, East Java
54	T	Ksp0351	Ble Sodik	Semen, Gandusari, Blitar, East Java
55	T	LBP0015	Partini	Nusupan Jarak, Wonosalam, Jombang, East Java
56	T	MEP0022	Sairin	Wonorejo, Kasembon, Malang, East Java
57	T	PPP0009	Sarno	Tanggaran, Pule, Trenggalek, East Java
58	T	Jap0044	Gatut suprapto	Gandekan, Wonodadi, Blitar, East Java
59	T	KJP0559	Turiman	Babadan, Ngajum, Malang, East Java
60	T	RTP0073	BLE BMP Fera pradita yudiana	Kanigoro, Kanigoro, Blitar, East Java
61	T	TWP0465	Gimun	Geger, Sendang, Tulungagung, East Java
62	T	TWP0505	Sinto	Gambiran, Pagerwojo, Tulungagung, East Java
63	T	KSP0427	Mamik	Semen, Gandusari, Blitar, East Java
64	T	NGP1450	Sutajianto	Jombok, Ngantang, Malang, East Java
65	T	TMP0298	Faturozi	Kalitengah, Krucil, Probolinggo, East Java
66	T	HBP0035	H.Samin	Sinar Rejeki, Jati Agung, Lampung Selatan, Lampung

No.	MoI[1]	Biodigester Number	Household Name	Location (Village, Sub-District, District, Province)
67	T	YLP0084	Sisyono	Sinar Harapan, Raja Basa, Bandar Lampung, Lampung
68	T	SDP0019	Demplot Jamaluddin	Banyu Urip, Gerung, Lombok Barat, NTB
69	T	YMP0451	Mahdi	Dasan Geria, Lingsar, Lombok Barat, NTB
70	T	PSP0513	Murhadi	Nyiurlembang, Narmada, Lombok Barat, NTB
71	T	SDP0392	Hj. Umminingsih	Narmada, Narmada, Lombok Barat, NTB
72	T	PCP0022	Fadli Sanjaya	Narmada, Narmada, Lombok Barat, NTB
73	T	PSP0355	A. Ruliatin	Setanggor, Praya Barat, Lombok Tengah, NTB
74	T	PSP0209	Marzuki	Kerembong, Janapria, Lombok Tengah, NTB
75	T	PRP0162	Samad	Ubung, Jonggat, Lombok Tengah, NTB
76	T	PSP0414	Ismail Marzuki	Setanggor, Praya Barat, Lombok Tengah, NTB
77	T	PSP0478	A. Ayu	Setanggor, Praya Barat , Lombok Tengah, NTB
78	T	SDP0164	Ishak	Mertak Tombok, Praya, Lombok Tengah, NTB
79	T	PRP0183	Inaq Sahril	Sukarara, Jonggat, Lombok Tengah, NTB
80	T	SGP0173	Akar	Tampak Siring, Batu Kliang, Lombok Tengah, NTB
81	T	SGP0169	Lim	Tampak Siring, Batu Kliang, Lombok Tengah, NTB
82	T	YMP0079	Blh Saprudin	Pijot, Keruak, Lombok Timur, NTB
83	T	YMP0258	Maspii	Tirtanadi, Labuhan Haji, Lombok Timur, NTB
84	T	YMP0222	Amaq Hasni	Paok Lombok, Wanasaba, Lombok Timur, NTB
85	T	YMP0560	Farhan	Swela, Swela, Lombok Timur, NTB
86	T	PLP0008	Abdurrahman	Poto, Moyo Hilir, Sumbawa, NTB

No.	MoI[1]	Biodigester Number	Household Name	Location (Village, Sub-District, District, Province)
87	T	PLP0141	Saparuddin	Moyo Hulu, Moyo Hulu, Sumbawa, NTB
88	T	PAP0161	Ruslan	Sabedo, Utan, Sumbawa, NTB
89	T	ALP0029	Denie Yanti W. Djara	Hambala, Kota Waingapu, Sumba Timur, NTT
90	T	SEP0019	Suranto	Lewa Paku, Lewa, Sumba Timur, NTT
91	T	LWP0043	Yohanis Keda Malo	Ombarade, Wewewa Tengah, Sumba Barat Daya, NTT
92	T	YAP0003	Muhammad Tawil	Palangka, Sinjai Selatan, Sinjai, South Sulawesi
93	T	YAP0028	Ahe	Biru, Kahu, Bone, South Sulawesi
94	T	YAP0084	Yusuf	Waji, Tellu Siattinge, Bone, South Sulawesi
95	T	BTP0229	Basri Dg Tuju	Popo, Galesong Selatan, Takalar, South Sulawesi
96	T	BSP0129	Parakkasi	Balocci Baru, Balocci, Pangkep, South Sulawesi
97	T	KUP0011	M. Samsir	Bulo Bulo, Bulukumpa, Bulukumba, South Sulawesi
98	T	REP0030	Amir Menna	Panyula, Tanete Riattang Timut, Bone, South Sulawesi
99	T	FZP0027	Abbas	Lemoe, Bacukiki, Pare-Pare, South Sulawesi
100	T	MBP0062	Fitri	Lebang, Cendana, Enrekang, South Sulawesi
101	T	BOP0117	I Ketut Widia Arnawa, SH	Buahan, Payangan, Gianyar, Bali
102	T	PBP0493	Dak Pardi	Umbul Harjo, Cangkringan, Sleman, D.I. Yogyakarta
103	T	TJP0443	Dak Iim	Cicadas, Sagalaherang, Subang, West Java
104	T	KBP0900	Atang Bin Karwito	Cicadas, Sagalaherang, Subang, West Java

No.	MoI[1]	Biodigester Number	Household Name	Location (Village, Sub-District, District, Province)
105	T	QTP0086	Yusmin	Jetak, Getasan, Semarang, Central Java
106	T	SKP0091	Prayitno	Tutur, Tutur, Kota Pasuruan,, East Java

VPA-2:

No.	MoI[1]	Biodigester Number	Household Name	Location (Village, Sub-District, District, Province)
1	T	DWP0197	I Wyan Suardana	Darmasaba, Abiansemal, Badung, Bali
2	T	LSP0086	I Putu Sumarka	Selat, Sukasada, Buleleng, Bali
3	T	MKP0277	Drs I Made Sudiarawan	Lalang Linggah, Selemadeg, Barat Tabanan, Bali
4	T	LSP0087	Wayan Kertia	Selat, Sukasada, Buleleng, Bali
5	T	DWP0225	I Wayan Suwita	Kemasan, Klungkung, Klungkung, Bali
6	T	BPP0072	KIVA Sutiyana / Ngadirin	Sendang Agung, Minggir, Sleman, D.I. Yogyakarta
7	T	BPP0168	Samsulistya	Sidomulyo, Bambang Lipuro, Bantul, D.I. Yogyakarta
8	T	PBP1268	Ismanto	Jatirejo, Lendah, Kulon Progo, D.I. Yogyakarta
9	T	PBP1273	Sarno	Jatireo, Lendah, Kulon Progo, D.I. Yogyakarta
10	T	PBP1316	Ramidi	Wukirsari, Cangkringan, Sleman, D.I. Yogyakarta
11	T	PBP1339	Parjito	Umbulharjo, Cangkringan, Sleman, D.I. Yogyakarta
12	T	Pbp1352	Anjar suprapto	Umbulharjo, Cangkringan, Sleman, D.I. Yogyakarta
13	T	Pbp1396	Marsudi	Hargobinangun, Pakem, Sleman, D.I. Yogyakarta
14	T	Pbp1397	Wardi suyato	Hargobinangun, Pakem, Sleman, D.I. Yogyakarta

No.	MoI[1]	Biodigester Number	Household Name	Location (Village, Sub-District, District, Province)
15	T	PBP1416	Sudarmanto	Ngawu, Playen, Gunungkidul, D.I. Yogyakarta
16	T	PBP1437	Sumirah	Ngawu, Playen, Gunungkidul, D.I. Yogyakarta
17	T	PBP1470	Suharyana	Banyuroto, Nanggulan, Kulon Progo, D.I. Yogyakarta
18	T	PBP1480	Jumingin / Arini	Sidorejo, Lendah, Kulon Progo, D.I. Yogyakarta
19	T	PBP1513	Kasim	Umbulharjo, Cangkringan, Sleman, D.I. Yogyakarta
20	T	PBP1508	Saryoto	Umbulharjo, Cangkringan, Sleman, D.I. Yogyakarta
21	T	PBP1558	Suhartono	Umbulharjo, Cangkringan, Sleman, D.I. Yogyakarta
22	T	PBP1564	Jiyo Muhammad marzuki	Wukirharjo, Prambanan, Sleman, D.I. Yogyakarta
23	T	PBP1574	Rubiman	Wukirharjo, Prambanan, Sleman, D.I. Yogyakarta
24	T	PBP1624	Bakri	Garbosari, Samigaluh, Kulonprogo, D.I. Yogyakarta
25	T	PBP1631	Riyanto	Garbosari, Samigaluh, Kulonprogo, D.I. Yogyakarta
26	T	Kip0088	Pupung/epon	Sukajaya, Lembang, Bandung Barat, West Java
27	T	Kip0099	Lilit rosmaya	Padaasih, Cisarua, Bandung Barat, West Java
28	T	LPP0428	Madi	Sukorejo, Sambirejo, Sragen, Central Java
29	T	LPP0448	Paiman	Sukorejo, Sambirejo, Sragen, Central Java
30	T	TKP0165	Suyono	Rogomulyo, Kaliwungu, Semarang, Central Java
31	T	LPP0443	Sudir	Sukorejo, Sambirejo, Sragen, Central Java

No.	MoI[1]	Biodigester Number	Household Name	Location (Village, Sub-District, District, Province)
32	T	BAP0048	Sarjono	Pucang Sari, Purwodadi, Pasuruan, East Java
33	T	JBP0002	Subadri	Sempusari, Kaliwates, Jember, East Java
34	T	KJP0659	Tari	Sumbersuko, Wagir, Malang, East Java
35	T	KJP0634	Tiwar	Argosari, Jabung, Malang, East Java
36	T	KPP0568	Sodikin	Oro Oro, Ombo Batu, Kota Batu, East Java
37	T	BAP0072	Noto	Tambak Sari, Purwodadi, Pasuruan, East Java
38	T	LBP0083	Yateno	Sidorejo Medowo, Kandangan, Kediri, East Java
39	T	NGP1425	Poniran	Pagersari, Ngantang, Malang, East Java
40	T	SPP1338	Ridwan	Ngabab, Pujon, Malang, East Java
41	T	TMP0323	Suliono	Kandangtepus, Senduro, Lumajang, East Java
42	T	TWP0569	Tardi	Sendang, Sendang, Tulungagung, East Java
43	T	KTP0198	Sugianto	Ampelsari, Pasrepan, Pasuruan, East Java
44	T	SPP1378	Paidi	Madiredo, Pujon, Malang, East Java
45	T	NGP1471	Bianto	Sidodadi, Ngantang, Malang, East Java
46	T	SPP1342	Kusmianto	Bendosari, Pujon, Malang, East Java
47	T	NUP0086	Samanto	Rama Utama, Seputih Raman, Lampung Tengah, Lampung
48	T	YLP0118	Darmoko	Rejoagung, Batanghari, Lampung Timur, Lampung
49	T	HBP0205	Yamidi	Rantau Pajar, Raman Utara, Lampung Timur, Lampung
50	T	PCP0242	Rumisah	Badrain, Narmada, Lombok Barat, NTB

No.	MoI[1]	Biodigester Number	Household Name	Location (Village, Sub-District, District, Province)
51	T	PCP0058	Inak Enem	Kuripan Selatan, Kuripan, Lombok Barat, NTB
52	T	PCP0277	Sahnun	Dasan Baru, Kediri, Lombok Barat, NTB
53	T	SGP0354	Sukirman	Narmada, Narmada, Lombok Barat, NTB
54	T	PCP0237	H. Saleh	Mekar Sari, Narmada, Lombok Barat, NTB
55	T	SGP0402	Maknun	Jembatan Kembar, Lembar, Lombok Barat, NTB
56	T	MJP0160	Heri Gp	Barejulat, Jonggat, Lombok Tengah, NTB
57	T	SGP0342	Ripawan	Sisik, Pringgarata, Lombok Tengah, NTB
58	T	SGP0346	Ihsanudin	Sisik, Pringgarata, Lombok Tengah, NTB
59	T	YSP1623	Sahrum	Pesanggrahan, Mt. Gading, Lombok Timur, NTB
60	T	YSP1650	Zulpatoni	Ketangga, Swela, Lombok Timur, NTB
61	T	YSP1638	A. Rohanis / Muhadis	Jenggik, Terara, Lombok Timur, NTB
62	T	YSP1572	I Ketut Suliasa	Sambik Elen, Bayan, Lombok Utara, NTB
63	T	YSP1569	Nyoman Yasa	Sambik Elen, Bayan, Lombok Utara, NTB
64	T	PAP0213	Sukamulya	Sekokat, Labangka, Sumbawa, NTB
65	T	PAP0219	Azhar	Sekokat, Labangka, Sumbawa, NTB
66	T	PAP0225	Sahdan	Sekokat, Labangka, Sumbawa, NTB
67	T	PAP0229	Lalu Hakmullah	Labangka, Labangka, Sumbawa, NTB
68	T	PAP0244	Sudin	Prode Spi, Plampang, Sumbawa, NTB
69	T	HSP0149	Viktor E. Wukak	Langgalero, Kota Tambolaka, Sumba Barat Daya, NTT
70	T	Hsp0231	Stepanus Ninni	Wee Patando, Wewewa Tengah, Sumba Barat Daya, NTT

No.	MoI[1]	Biodigester Number	Household Name	Location (Village, Sub-District, District, Province)
71	T	HSP0215	Yuliana Bili	Ramadana, Laura, Sumba Barat Daya, NTT
72	T	KKP0171	Johanis Lede Kaka, S.PD	Kambajawa, Kota Waingapu, Sumba Timur, NTT
73	T	KKP0190	Imanuel Praing	Watupuda, Umalulu, Sumba Timur, NTT
74	T	KKP0248	Ndaung Wohangara	Palanggai Pahunga, Lodu, Sumba Timur, NTT
75	T	LWP0210	Theresia lalo	Pero, Wewewa Barat, Sumba Barat Daya, NTT
76	T	LWP0303	Petrus Nani	Lete Konda, Loura, Sumba Barat Daya,NTT
77	T	LWP0512	RM. viruminus b bego	Tena Teke, Wewewa selatan, Sumba barat daya, NTT
78	T	ROP0015	Fransiskus K. Pekambani	Prailiu, Kambera, Sumba Timur, NTT
79	T	KKP0236	Banda Djundja	Mutunggeding, Umalulu, Sumba Timur, NTT
80	T	ROP0038	John D Tay	Wangga, Kambera, Sumba Timur, NTT
81	T	LWP0523	David Lede	Waimangura, Wewewa Barat, Sumba Barat Daya, NTT
82	T	BTP0481	Karim Dg Mone	Gentungan, Bontonompo, Gowa, South Sulawesi
83	T	MDP0244	Muhammad Sayuti	Mananti, Tellulimpoe, Sinjai, South Sulawesi
84	T	MDP0306	Ramli	Palae, Sinjai Selatan, Sinjai, South Sulawesi
85	T	NIP0199	Muh. Ali	Bola, Bola, Wajo, South Sulawesi
86	T	REP0334	Undhy Wahyudi	Mattampa Walie, Lamuru, Bone, South Sulawesi
87	T	REP0315	Sudirman	Alehanoae, Sinjai Utara, Sinjai, South Sulawesi
88	T	RNP0034	Nurdin	Bentengparenbang, Lembang, Pinrang, South Sulawesi
89	T	RNP0047	P. Gusti	Marannu, Mattirobulu, Pinrang, South Sulawesi

No.	MoI[1]	Biodigester Number	Household Name	Location (Village, Sub-District, District, Province)
90	T	RNP0055	Nonci	Bunga, Mattirobulu, Pinrang, South Sulawesi
91	T	RNP0136	Temme	Sipatuo, Patampanua, Pinrang, South Sulawesi
92	T	RAP0063	Abd. Hamid Y	Loka, Rumbia, Jeneponto, South Sulawesi
93	T	RNP0226	Jumadi	Sipatuo, Patampanua, Pinrang, South Sulawesi
94	T	RNP0101	Sudirman	Jampu, Patampania, Pinrang, South Sulawesi
95	T	KUP0270	Muh. Amir	Caramming, Bonto Tiro, Bulukumba, South Sulawesi
96	T	MDP0312	Muh Aris	Palae, Sinjai Selatan, Sinjai, South Sulawesi
97	T	MDP0396	Nasir	Saotengah, Tellulimpoe, Sinjai, South Sulawesi
98	T	RAP0058	Barodding	Bulujaya, Bangkalan, Barat Jeneponto, South Sulawesi
99	T	RAP0063	Abdul Hamid Y.	Loka, Rumbia, Jeneponto, South Sulawesi
100	T	RNP0243	Syamsir	Data, Duampanua, Pinrang, South Sulawesi
101	T	KIP0074	Ade Sulaeman	Margamukti, Pengalengan, Bandung, West Java
102	T	MDP0352	Suardi	Mannanti, Tellu Limpoe, Sinjai, South Sulawesi
103	T	KUP0207	Muh.Basir / Amriani	Jojjolo, Bulukumpa, Bulukumba, South Sulawesi
104	T	MDP0244	Muhammad Sayuti	Mananti, Tellulimpoe, Sinjai, South Sulawesi
105	T	DWP0211	I Ketut Gunawan	Bukian, Payangan Gianyar, Bali

1) Means of Interview: (**T**elephone, **E**-Mail, **V**isit)

ANNEX

A1: Verification Protocol

A2: Statements of Competence of involved Personnel

ANNEX 1: VERIFICATION PROTOCOL

Table A-1: GHG calculation procedures and management control testing / detailed audit testing of residual risk areas and random testing

Identification of potential reporting risk	Identification, assessment and testing of management controls	Areas of residual risks	Additional verification testing	Conclusions and Areas Requiring Improvement (including *Forward Action Requests*)
Raw data generation				
• Installation of measuring equipment • Dysfunction of installed equipment • Mal-operation by operational personnel • Downtimes of equipment • Exchange of equipment • Change of measurement equipment characteristic • Insufficient accuracy	• Installation of modern and state of the art equipment • Process control automation • Internal data review • Regular visual inspect-ions of installed equip-ment • Only skilled and trained personnel operate the relevant equipment • Daily raw data checks • Immediate exchange of dysfunctional equipment	• Inadequate installation / operation of the monitoring equipment • Inadequate exchange of equipment • Change of personnel • Undetected measurement errors • Inappropriateness of Management system procedures w.r.t. monitoring plan requirements (e.g. substitute value strategies) • Non-application of management system procedures • Insufficient accuracy	• Site – visit • Check of equipment • Check of technical data sheets • Check of suppliers information / guarantees • Check of calibration records, if applicable • Check of maintenance records • Counter-check of raw data and commercial data • Check of GS management system	• **See Table A-2**

Identification of potential reporting risk	Identification, assessment and testing of management controls	Areas of residual risks	Additional verification testing	Conclusions and Areas Requiring Improvement (including *Forward Action Requests*)
• Change of technology • Accuracy of values supplied by Third Parties	• Stand-by duty is organized • Training • Internal audit procedures • Internal check of QA/QC measures of involved Third Parties	• Inappropriate QA/QC measures of Third Parties	• Check of CDM related procedures • Application of GS management system procedures • Check of trainings • Check of responsibilities • Check of QA/QC documentation / evidences of involved Third Parties	
Raw data collection and data aggregation				
• Wrong data transfer from raw data to daily and monthly aggregated reporting forms • IT Systems • Spread sheet programming	• Cross-check of data • Plausibility checks of various parameters. • Appropriate archiving system • Clear allocation of responsibilities	• Unintended usage of old data that has been revised • Incomplete documentation • Ex-post corrections of records • Ambiguous sources of information	• Check of data aggregation steps • Counter-calculation • Data integrity checks by means of graphical data analysis and calculation of specific performance figures	• **See Table A-2**

Identification of potential reporting risk	Identification, assessment and testing of management controls	Areas of residual risks	Additional verification testing	Conclusions and Areas Requiring Improvement (including *Forward Action Requests*)
• Manual data transmission • Data protection • Responsibilities	• Application of GS Management system procedures • Usage of standard software solutions (Spreadsheets) • Limited access to IT systems • Data protection procedures	• Non-application of management system procedures • Manual data transfer mistakes • Unintended change of spread sheet programming or data base entries • Problems caused by updating/upgrading or change of applied software	• Check of management system certification • Check of data archiving system • Check of application of Management system procedures	
Other calculation parameters				
• Emission factors, oxidation factors, coefficients	• The values and data sources applied are defined in the VPA-DD and monitoring plan	• Unintended or intended Modification of calculation parameters • Wrong application of values • Misinterpretations of the applied methodology and/ or the VPA-DD	• Update-check of regulatory framework • Countercheck of the applied MP in the MR against the methodology and the VPA-DD	• **See Table A-2**

Identification of potential reporting risk	Identification, assessment and testing of management controls	Areas of residual risks	Additional verification testing	Conclusions and Areas Requiring Improvement (including *Forward Action Requests*)
		• Missing update of applicable regulatory framework (e.g. IPCC values)		
Calculation Methods				
• Applied formulae • Miscalculation • Mistakes in spread-sheet calculation	• Advanced calculation and reporting tools • A carbon consultant is in charge of the related calculations • Usage of tested / counterchecked Excel spreadsheets • Involvement of external consultants	• The danger of miscalculation can only be minimized.	• Countercheck on the basis of own calculation. • Spread sheet walk-trough. • Plausibility checks • Check of plots	• **See Table A-2**
Monitoring reporting				
• Data transfer to the author of the monitoring report • Data transfer to the monitoring report	• An experienced consultant is responsible for monitoring reporting.	• The danger of data transfer mistakes can only be minimized • Inappropriate application of QMS procedures	• Counter check with evidences provided. • Audit of procedure application	• **See Table A-2**

Identification of potential reporting risk	Identification, assessment and testing of management controls	Areas of residual risks	Additional verification testing	Conclusions and Areas Requiring Improvement (including *Forward Action Requests*)
• Unintended use of outdated versions	• GS QMS procedures are defined			

Table A-2: (Project specific) Periodic Verification Checklist

Checklist Item (incl. guidance for the verification team)	**Refe-rence**	**Verification Team Comments** (Means and results of assessment)	**Draft Concl.**	**Final Concl.**
A. Description of the PoA and its component project activity (-ies)				
A.1. Purpose and general description of the PoA and VPA(s) *Check if section of the MR includes the following:* - *Purpose of the PoA and each VPA and the measures taken to reduce GHG emissions* - *Brief description of the installed technology and equipment* - *Relevant dates for the project activity (e.g. construction, commissioning, continued operation periods etc.)* - *Total emission reductions achieved in this monitoring period*	/MRVPA 1/ /MRVPA 2/ /GSPoA DD/ /VPA1DD / /VPA2DD /	The verification team has checked section A.1 of the MR and confirms that the information provided is complete and correct with regards to the following: Purpose of the PoA and its VPA(s) and the measures taken to reduce GHG emissions ☐ Brief description of the installed technology and equipment ☐ Relevant dates for the VPAs (e.g. construction, commissioning, continued operation periods, VPA inclusion, etc) ☐ Emission reductions achieved in this monitoring period by each VPA and total emission reductions achieved by the PoA In this context the below finding has been identified: VPA-1: Refer CL B-1, CL B-2 CL B-3 and CAR B-4 raised VPA-2: Refer CL B-1 raised	VPA-1 ~~CL B-1~~ ~~CL B-2~~ ~~CL B-3~~ ~~CAR B-4~~ VPA-2 ~~CL B-1~~	OK OK OK
A.2. Location of project activity *Check if section of the MR reflects correctly the following:* - *Host Party(ies)* - *Region / State / Province etc.*	/MRVPA 1/ /MRVPA 2/ /VPA1DD /	The verification team has checked section A.2 of the MR and confirms by means of comparison with the information given in the VPA-DD and information gathered during the site visit that the information provided is complete and correct with regards to the following: ☒ Host Party(ies)	OK	OK

- *City / Town / Community etc.* - *Physical / geographical location (e.g. Latitude and Longitude)*	/VPA2DD/ /IM01/ /IM03/	☒ Region / State / Province ☒ City / Town / Community ☒ Physical / Geographical location In this context no findings have been identified:		
A.3. Parties and Project Participants *Check if section of the MR includes the following:* - *All PPs as displayed on the UNFCCC website* - *A correctly filled table as per the MR template*	/MR/ /GS/	The verification team has checked section Annex 1 of the MR as well as the GS website and confirms that: ☒ all PPs as displayed on the project related GS website are correctly listed ☒ the table as per the template MR has been correctly filled In this context no findings have been identified:	OK	OK
A.4. Reference of applied methodology *Check if section of the MR correctly describes / includes the following:* - *Reference to the applicable version of the methodology* - *Reference to the applicable version(s) of relevant methodological tools* - *Relevant GS/EB decisions, if applicable*	/MRVPA1 /MRVPA2// /VPA1DD/ /VPA2DD/ /GS/	The verification team has checked section 1.1 of the MR and confirms by means of comparison with the information given in the VPA-DD and displayed on the GS website that the information provided is complete and correct with regards to the following: ☒ Number, title and version of the applicable GS Methodology ☒ Relevant GS decisions In this context no findings have been identified:	OK	OK
A.5. Crediting period of project activity *Check if section of the MR correctly includes the following:* - *Start date of the crediting period. In this context please check, if applicable, whether post*	/MRVPA1/ /MRVPA2/ /GS/	The verification team has checked section 1.1 of the MR(s) and confirms by means of comparison with the information displayed on the GS website that the information provided is complete and correct with regards to the following: ☒ Start date of the crediting period. ☒ Type and length of the crediting period	OK	OK

registration changes to the start date have been accepted by the GS. - *Length and type of the crediting period*	/GSIR/	In this context no findings have been identified:		
A.6. Publication of the Work Plan *Check if the work plan has been made submitted to GS before the verification commenced.*	/GS/	The verification team has ensured and confirms by means of checking the respective project information on the GS website that: ☒ The work and audit plan, was submitted to GS prior to the start of the verification activities. ☒ No comments have been received. In this context no findings have been identified:	OK	OK
B. Implementation of project activity				
B.1. Description of implemented registered programme of activities *Check if section of the MR correctly describes / includes the following:* - *Implementation status of the PoA and its VPAs* - *Detailed description of installed technology(ies) / technical processes and equipment applied* - *Diagrams (where appropriate)* - *Whether a single report or two MR are prepared; in case of two MR, check that all VPAs are considered in two separate batches*	/MRVPA 1/ /MRVPA 2/ /GSPoA DD/ /VPA1DD / VPA2DD/ /IM01/	The verification team has checked section 1 of the MR and confirms by means of comparison with the information given in the PoA-DD and VPA-DD, the project standard and information gathered during the site visit that: ☒ the description of the implementation status of the VPA is in line with the applicable provisions of the Gold standard ☒ an appropriate description of the installed technology(ies), technical process and equipment incl. diagrams, where applicable, has been included ☐ one single MR has been provided including all VPAs, OR ☒ two different MRs are prepared including all VPAs and information on the reference numbers of the VPAs that are included in each batch. In this context no findings have been identified:	OK	OK

B.1.1. Initial project implementation *Assess whether the VPA has been implemented and operated as per the registered VPA-DD and are all physical features of the project in place.* *Further focus on the potential phase wise implementation and check the reporting on the corresponding status and starting dates accordingly.* *Check if the project is still in compliance with the applicability conditions of the methodology.* *Also, discuss – if applicable – the necessity of PRC notifications / approvals.*	/MRVPA 1/ /MRVPA 2/ /VPA1DD / /VPA2DD /	The verification team has checked the implemented project activity and the MR and confirms by means of comparison with the information given in the VAP-DD, the applicable Gold Standard Requirements, Toolkit and information gathered during the site visit that: ☒ the project has been implemented and operated as per the registered VAP-DD and the GS Passport and all physical features of the project are in place ☒ the project has been implemented phase wise and corresponding evidence has been provided ☒ the project is still in compliance with the applied methodology In this context no findings have been identified:	OK	OK
B.1.2. Technical equipment changes *Check if relevant technical equipment of the project activity has been exchanged or modified during the monitoring period. Further ensure that consistent notations of key equipment (meters etc.) in MR and calculation spreadsheet are applied* *Consider e.g. interviews with operational personnel, QMS records, maintenance records, instrument specifications.* *In case of changes, check whether the project is still in line with the registered VPA-DD and assure that these changes have been considered in the monitoring report and the emission reduction calculation.* *In case of post registration changes pl. refer to chapter B.2.*	/MRVPA 1/ /MRVPA 2/ /VPA1DD / /VPA2DD /	The verification team has checked the implemented project activity and the MR and confirms by means of comparison with the information given in the VPA-DD, the applicable GS Requirements and Toolkit and information gathered during the site visit and interviews that: ☒ no technical equipment has been exchanged or modified during the monitoring period ☒ the notations of key equipment are consistently applied in the project documentation In this context no findings have been identified:	OK	OK

B.1.3. Operation of the project activity *Check if relevant operation modes of the project activity have been exchanged or modified during the monitoring period.* *Consider e.g. interviews with operational personnel, operation log sheets, data management system records.* *In case of changes, check whether the project is still in line with the registered VPA-DD and assure that these changes have been considered in the monitoring report and the emission reduction calculation.* *In case of post registration changes pl. refer to chapter B.2.*	/MRVPA 1/ /MRVPA 2/ /VPA1DD / /VPA2DD /	The verification team has checked the implemented project activity and the MR and confirms by means of comparison with the information given in the VPA-DD, the applicable Gold Standard Requirements and Toolkit and information gathered during the site visit and interviews that: ☒ no relevant operation modes of the project activity have been exchanged or modified during the monitoring period ☐ the following changes have been adopted during the monitoring period, however the project is still in line with the registered VPA-DD:	OK	OK
B.1.4. Incidents *Identify if there have been any significant incidents, deviant operation modes and / or downtimes of the equipment?* *Consider e.g. interviews with operational personnel, operational log sheets, analysis of performance data.*	/MRVPA 1/ /MRVPA 2/	The verification team has checked the implemented project activity and the MR and confirms by means of comparison with the information given in the VPA-DD, the applicable Gold Standard Requirements and Toolkit and information gathered during the site visit and interviews that: ☒ no significant incidents, deviant operation modes and / or downtimes of the equipment happened during the monitoring period ☐ the following incidents, deviant operation modes and / or downtimes of the equipment happened during the monitoring period	OK	OK
B.1.5. Legislation Find out – esp. in the context of methodological requirements - whether relevant legislation with effect	/MRVPA 1/ /MRVPA 2/	The verification team has checked the host country legislation and confirms by means of comparison with the implemented project that: ☒ No relevant legislation with effect on the project activity in the host country has been changed	OK	OK

on the project activity in the host country has been changed. Assess, in case of changes, whether consequences for the PA with regard to relevant CDM requirements have been accounted for. In case of changes data sources shall be referenced.		In this context no findings have been identified.		
B.1.6. Open issues from validation *Check (esp. in case of 1st periodic verification) whether there are any open issues indicated in the validation report (e.g. FAR)?*	/VAL/	☐ There were no open issues addressed in the validation report ☒ All open issues from the validation have been appropriately addressed. ☐ The following issues related to the validation have not yet been appropriately addressed:	OK	OK
B.1.7. Open issues from previous verification *Check in case of further periodic verifications whether there are any open issues indicated in previous verification reports (FAR) and take into consideration the guidance as specified in VVS.*	/MR/ /VER/ /GSIR/	☒ There were no open issues addressed in the previous verification report ☐ All open issues from the previous verification have been appropriately addressed. ☒ The following issues related to the previous verification have not yet been appropriately addressed:	OK	OK
B.2. Post registration changes				
B.2.1. Post registration changes applicable to the proposed project activity *Indicate whether any post registration change already approved or under approval by the GS has been identified.*	/MRVPA 1/ /MRVPA 2 /VPA1DD/	☒ No, by means of site visit, document check and interview it could be verified that the project is implemented and operated in line with the registered VAP-DD and the applied methodology. (Please proceed with section C) ☐ Yes, post registration changes have been identified and are assessed in detail in the subsequent steps. (Please proceed with B.2.2.)	OK	OK

	/VPA2DD/			
B.2.2. Temporary deviations from the registered monitoring plan or applied methodology (TDfrMP; TDfMM) *Indicate whether any temporary deviations have been applied during this monitoring period.* *In cases where approval has been sought from the EB please provide reference.* *If applied, provide a description of the deviation(s).* *This should include the reasons for the deviation(s), how it deviates from the monitoring plan and/or applied methodology(ies), the duration for which the deviation(s) is(are) applicable and justification on the conservativeness of the approach. Indicate if the deviation will lead to a reduction in the accuracy and if so, which conservative assumptions and discount factors have been applied.* *For deviation(s) that require prior approval by the Board, include the date of approval and reference number.*	/MRVPA1/ /MRVPA2/ /VPA1DD/ /VPA2//	☒ No TDfrMP or TDfMM have been submitted to the GS prior to the current monitoring period ☐ The following TDfrMP or TDfMM have been approved or are under approval by the GS 1 Title Status ☐ under approval; ☐ approved Appr.date Ref. No. 2 Title Status ☐ under approval; ☐ approved Appr.date Ref.No. ☒ During the verification of the current MP no need for a TDfrMP or TDfMM has been identified. The monitoring plan is in accordance with the approved methodology applied by the PA ☐ An approval of the following TDfrMP or TDfMM is to be requested from the GS for the current MP as appendix 1 of the project standard does not apply. 1 Issue: 2 Issue:	OK	OK

		☐ The following TDfrMP or TDfMM for which appendix 1 of the PS is applicable have been applied: 1 Issue: 2 Issue: In this context no findings have been identified:		
B.2.3. Corrections *Indicate whether any corrections to project information or parameters fixed at validation have been approved during this monitoring period or submitted with this monitoring report.* *In cases where the correction(s) and the revised VPA-DD are approved prior to the submission of this monitoring report for request for issuance, provide the approval date and reference number. Otherwise, provide the version number and the completion date of the revised VPA-DD.* *Please check and report that the corrected information is an accurate reflection of the actual project information and that the corrected parameters are in accordance with the applied methodology and the monitoring plan.*	/MRVPA 1/ /MRVPA 2 /VPA1DD / /VPA2DD /	☒ During the verification of the current MP no need for corrections has been identified. ☐ The following corrections have been applied: 1 Issue: 2 Issue: In this context no findings have been identified:	OK	OK
B.2.4. Permanent changes from the registered monitoring plan or applied methodology (PCfrMP; PCfMM) *Indicate whether any permanent changes from the registered monitoring plan or applied methodologies*	/MRVPA 1/ /MRVPA 2 /VPA1DD /	☒ No PCfrMP or PCfMM.have been submitted to the GS prior to the current monitoring period ☐ The following PCfrMP or PCfMM have been approved or are under approval by the GS 1 Title	OK	OK

have been approved during this monitoring period or submitted with this monitoring report. *Assure that modifications or additions of technologies/measures respect to the VPA-DD were already included in the originally registered PoA-DD.* *In cases where the change(s) and the revised VPA-DD are approved prior to the submission of this monitoring report for request for issuance, provide the approval date and reference number. Otherwise, provide the version number and the completion date of the revised VPA-DD.*	/VPA2DD/	☐	Status: ☐ under approval; ☐ approved Appr.date: Ref. No.: 2 Title: Status: ☐ under approval; ☐ approved Appr.date: Ref.No.	
		☒	During the verification of the current MP no need for a PCfrMP or PCfMM has been identified. The monitoring plan is in accordance with the approved methodology applied by the PA	
		☐	An approval of the following PCfrMP or PCfMM is to be requested from the GS for the current MP as appendix 1 of the project standard does not apply. 1 Issue: 2 Issue:	
		☐	The following PCfrMP or PCfMM for which appendix 1 of the PS is applicable have been applied: 1 Issue: 2 Issue:	
			In this context no findings have been identified:	
B.2.5. Changes to the project design of the registered PoA / VPA (CoPD)	/MRVPA 1/	☐	The following CoPD has been approved or are under approval by the GS	OK / OK

Indicate whether any changes to the project design of the project activity have been approved during this monitoring period or submitted with this monitoring report. *Assure that modifications or additions of technologies/measures respect to the VPA-DD were already included in the originally registered PoA-DD* *In cases where the change(s) and the revised VPA-DD are approved prior to the submission of this monitoring report for request for issuance, provide the approval date and reference number. Otherwise, provide the version number and the completion date of the revised VPA-DD.*	/MRVPA 2 /VPA1DD / /VPA2DD /		1	Title			
				Status	☐ under approval; ☐ approved		
				Appr.date			
				Ref. No.			
			2	Title			
				Status	☐ under approval; ☐ approved		
				Appr.date			
				Ref.No.			
		☒	During the verification of the current MP no need for a CoPD has been identified. The monitoring plan is in accordance with the approved methodology applied by the PA				
		☐	An approval of the following CoPD.is to be requested from the GS for the current MP as appendix 1 of the project standard does not apply.				
			1	Issue:			
			2	Issue:			
		☐	The following CoPD for which appendix 1 of the PS is applicable have been applied:				
			1	Issue:			
			2	Issue:			
		In this context no findings have been identified:					
C. Description of monitoring system							

C.1. Monitoring Plan – VPA-DD Compliance *Check if the monitoring plan is in accordance with the monitoring plan contained in the registered VPA-DD (or any accepted revised MP).* *Please check esp. If:* - *all parameters stated in the MP of the registered VPA-DD have been monitored and updated as applicable* - *the monitoring equipment has been controlled and calibrated as per the MP* - *the monitoring results are consistently recorded as per the approved frequency* - *QA/QC procedures have been applied in accordance with the MP*	/MRVPA 1/ /MRVPA 2/ /VPA1DD / /VPA2DD / /BUS/	By means of comparison of the MR with the registered VPA-DD (or any revisions thereof) the verification team has checked whether the MP is in compliance with the registered VPA-DD. The outcome is as follows: ☒ The MP is completely in accordance with the last registered version of the VPA-DD / MP. In this context no findings have been identified:	OK	OK
C.2. Monitoring Plan – Meth Compliance *Check if the monitoring plan is in accordance with the applied methodology.* *In case the methodology references applicable tools it has to be ensured that the MP is also compliant with those tools.* *Also please specify if monitoring aspects have been identified that are not specified in the methodology but may enhance the level of accuracy and completeness of the monitoring plan – this esp. applies for SSC VPAs.*	/MRVPA 1//MRVPA2/ /VPA1DD / /VPA2DD / /GSM/	By means of comparison of the MR with the applied GS methodology and related tools the verification team has checked whether the MP is in compliance with the MP related requirements of the applied methodology. The outcome is as follows: ☒ The MP is completely in accordance with the approved methodology applied by the GS project (last registered version of the VPA-DD) ☐ The MP is completely in accordance with the applied tools which the methodology references. A breakdown of the referenced tools is as follows: 1 Title (of the tool) [ ] Version [ ]	OK	OK

				MP compliance	☐ full compliance ☐ findings have been raised ☒ N/A (for MP)		
			2	Title (of the tool)			
				Version			
				MP compliance	☐ full compliance ☐ findings have been raised ☒ N/A (for MP)		
			3	Title (of the tool)			
				Version			
				MP compliance	☐ full compliance ☐ findings have been raised ☒ N/A (for MP)		
		In this context no findings have been identified:					
C.3. Management System *Check if the GHG data monitoring system can be assessed as appropriate.* *In case reference is made to a (certified) company quality management system, check if all GS related monitoring procedures have been fully integrated in the project participant's quality management system.*	/MR/ /VPA1DB/ /VPA2DB/ /BUS/ /KPT/ /L1/	*Description:* An independent consultant has been hired to conduct the monitoring of carbon parameters and GS sustainability indicators for the national biodigesters programme. The project activity has a project database managed at Hivos Indonesia central office in Jakarta, Indonesia. The organization chart for the monitoring activities includes Hivos Indonesia operational personnel and carbon consultants who			OK	OK	

In case of a stand-alone system, check how the GHG management system has been implemented and effectiveness is ensured.		manage the database and conduct field surveys for usage, CMS and KPT. *Verifier´s action:* The project database, survey reports and forms have been reviewed by the verification team. *Conclusion:* The management system was set up as a stand-alone system and exclusively for the Hivos. The system has been implemented effectively.		
C.4. Roles and Responsibilities *Check if all roles and positions of each person in the GHG data management process are clearly defined and implemented as stated in the monitoring plan. Please consider the complete data trail from raw data generation to submission of the final data.* *Identify, if relevant personnel w.r.t. monitoring has been exchanged?* *If so, have appropriate training measures been carried out.* *In case of changes, assure that the implemented monitoring procedures have not been affected.*	/MRVPA 1/ /MRVPA 2/ /GSP/	*Description:* The project activity has a project database managed at the Hivos central office in Jakarta. The organization chart for the monitoring activities includes Hivos operational personnel and carbon consultants who manage the database and conduct field surveys for usage, CMS and KPT. *Verifier´s action:* The project database, survey report and forms have been reviewed by the verification team. *Conclusion:* The survey report and forms have been checked and used without any change so far up to the end of the current monitoring period.	OK	OK
C.5. Emergency procedures for the monitoring system *Check, as appropriate, whether relevant emergency procedures for the monitoring system have been*	/MRVAP 1/ /MRVPA 2/ /QA1/	*Description:* The computer server in the office has the primary back-up data stored and an external back-up at external media which will be used in the event of an emergency. *Verifier´s action:*	OK	OK

included in the MR and assess whether these procedures have been implemented, when required	/IM01/ /IM02/	During the on-site visit, the verification team has checked the server to confirm the primary data and records stored are the most recent for the MRI. The stored data are password protected and only authorized person could access. The database officer was interviewed to confirm how the data is applied in emergency case. *Conclusion:* By means of onsite assessment and checking the stored data, it can be concluded emergency respond plan is in place.		
C.6. Data archive and data protection Check whether all records of monitoring parameters are archived according to the monitoring plan. Assess further whether appropriate measures have been taken in order to avoid unintended or intended manipulation or loss of the measured data.	/MRVPA 1/ /MRVPA 2/ /VPA1DD / /VPA2DD / /IM01/ /IM02/	*Description:* Chapter 6 of the monitoring report also described how the data is archived and backed up. *Verifier´s action:* The data was kept in a project database at Hivos Indonesia central office in Jakarta. The data was backed up periodically onto hard disk media. During the on-site visit, the verification team has conducted interview and reviewed the records archiving method and procedures for the monitored parameters stated in MR and VPA-DD. Two persons were authorized to access the database key-in interface and only the administrator is authorized to edit the saved database. Furthermore, the data stored at the server is password protected and only authorized personnel can access. *Conclusion:*	OK	OK

			By means of onsite assessment and checking the stored data, it can be concluded data archiving and protection is in place and has been properly implemented.		
D. Data and parameters					
D.1. Data and Parameters fixed ex ante					
a) Compliance with registered VPA-DD *Check whether the value applied is in compliance with the registered VPA-DD.*		/MRVPA 1/ /MRVPA 2/ /GSPoA DD/ /VPA1DD / /VPA2DD /	By means of comparison of the MR with the registered PDD (or any revisions thereof) the verification team confirms that: ☒ all ex ante data and parameters are in compliance with the registered PoA-PDD, VPA-DD and the applied methodology or any other tool. In this context no findings have been identified:	OK	OK
b) Compliance with the applied methodology *Check whether the value applied is in compliance with the applied methodology or any other tool.*		/MRVPA 1/ /MRVPA 2/ /GSM/	By means of comparison of the MR with the methodology the verification team confirms that: ☒ all ex post and parameters are in compliance with the applied methodology and any other tool. In this context no finding has been identified:	OK	OK
D.2. Data and Parameters monitored					
D.2.1. $U_{p1,y}$	**VPA-1: GS1174** **VPA-2: GS5303**		**Cumulative usage rate for technologies in project scenario p1 in year y, based on cumulative adoption rate and drop off rate (fraction)**		

a) Measurement / Determination method (VVS, §§ 363-367) *Describe how the monitoring parameter was measured / determined. Focus primarily on the original data level (ODL) but also describe the applied data aggregation trails (from ODL to data aggregation level zero (DAL0)).* *Check if relevant equipment has been exchanged and if in cases of failures / downtimes of standard equipment other measurement / determination methods have been used. Furthermore, verify the frequency of measurements as per the requirements.* *Assess whether the measurement / determination method is in line with the registered monitoring plan of the PDD and the applied methodology.*	/MRVPA 1/ /MRVPA 2/ /ERVPA1 / /ERBPA2 / /VPA1DB / /VPA2DB / /BUS/ /VPA1DD / /VPA2DD /	*Description:* The cumulative usage rate of bio-digesters for the monitoring period was 79.95% for VPA-1 and 71.08% for VPA-2. The data was consolidated from the biogas usage survey results, conducted by an independent consultant. The data is applied to calculate the emission reductions per unit per month. *Verifier´s action:* The data was crosschecked against the survey report records to confirm that the data is consistent. The data applied in the ER spreadsheet was reviewed *Conclusion:* The parameter is monitored in accordance with the registered VPA-DD and applied methodology.	OK	OK
b) Accuracy, correctness and QA/QC Procedure (VVS, §§ 368-374) *In case of measured (or estimated) values, check whether the accuracy of equipment used for monitoring is controlled and calibrated in accordance with the monitoring plan or if significant inaccuracies*	/MRVPA 1/ /MRVPA 2/	*Description:* The data was based on the survey results and no equipment involved in monitoring. As per the initial assessment the monitored value is deemed to be inconsistent.	~~OK~~	OK

occur; in this case, make sure that the most conservative assumptions theoretically possible have been made for calculating ERs. *Describe whether all applicable QA/QC procedures are met. Assess further if the calibration of the monitoring equipment has been carried out in line with the latest EB guidance.* *Include calibration dates and information in validity of the installed monitoring equipment in the table in Appendix 6.*		/VPA1DD/ /VPA2DD /VPA1DB/ /VPA2DB/ /BUS/ /QA1/ /IM01/ /IM02/	*Verifier´s action:* The data applied in ER spreadsheets were cross-checked with the usage survey report / forms records and found to be incorrectly The quality control procedure was reviewed and operation personnel interviewed *Conclusion:* The parameter is determined based on the survey results and monitored in accordance with the registered VPA-DDs.		
D.2.2. $N_{p1,y}$	**VPA-1: GS1174** **VPA-2: GS5303**		**Cumulative project operational rate included in the project database for project scenario p1 against baseline scenario b1 in year y**		
a) Measurement / Determination method (VVS, §§ 363-367) *Describe how the monitoring parameter was measured / determined. Focus primarily on the original data level (ODL) but also describe the applied data aggregation trails (from ODL to data aggregation level zero (DAL0)).* *Check if relevant equipment has been exchanged and if in cases of failures / downtimes of standard equipment other measurement / determination methods have been used. Furthermore, verify the frequency of measurements as per the requirements.*		/MRVPA1/ /MRVPA2/ /ERVPA1/ /ERVPA2/ /VPA1DB/	*Description:* The number of bio-digesters in operation during the monitoring period. It is calculated using monitoring parameters $N_{op1,y}$ and $O_{p1,y}$: VPA1: $N_{p1,y} = N_{op1,y} * (O_{p1,y}/365) = 79.95*$ no. of digester * ($O_{p1,y}$ /365) = no. of digesters in operation. VPA2 : $N_{p1,y} = N_{op1,y} * (O_{p1,y}/365) = 71.08*$ no. of digester * ($O_{p1,y}$ /365) = no. of digesters in operation.	VPA1 ~~CL C-1~~ ~~CAR C-2~~ VPA2 ~~CL C-1~~	OK

Assess whether the measurement / determination method is in line with the registered monitoring plan of the PDD and the applied methodology.	VPA2DB/ /BUS/ /O6/ /O7/ /IM01/ /IM04/	*Verifier´s action:* The database was reviewed to crosscheck on the number of units in operation during the monitoring period. The number of days for non-operation per year $O_{p1,y}$ was checked which is 15 days per year stipulated in the operation memo dated 01/05/2014. The calculated number of days bio-digesters ($O_{p1,y}$) in operation for the monitoring period was reviewed and could be confirmed as correct. Step 1: Calculate the number of days of the total installed digesters in operation. Step 2: Calculate the number of digesters in operation The number of digesters in operation in this monitoring period for VPA-1 were 16,151 and VPA-2 were 2,228 The operation personnel were interviewed on the number of days each digester will not be in operation per year.		
		Conclusion: The parameter is monitored in according to the registered VPA-DD and applied methodology. VPA-1: CL C-1 and CAR C-2 VPA2: CL C-1		
b) Accuracy, correctness and QA/QC Procedure (VVS, §§ 368-374) *In case of measured (or estimated) values, check whether the accuracy of equipment used for monitoring is controlled and calibrated in accordance*	/MRVPA 1/ /MRVPA 2/	*Description:* There is no instrument to measure this parameter. The data is calculated using actual number of units installed and number of days per year a bio-digester not in operation	VPA1 ~~CL C-1~~ ~~CAR C-2~~	OK

with the monitoring plan or if significant inaccuracies occur; in this case, make sure that the most conservative assumptions theoretically possible have been made for calculating ERs. *Describe whether all applicable QA/QC procedures are met. Assess further if the calibration of the monitoring equipment has been carried out in line with the latest EB guidance.* *Include calibration dates and information in validity of the installed monitoring equipment in the table in Appendix 6.*		/ERVAP1/ /ERVPA2/ /VPA1DB/ /VPA2DB/ /O6/ /QA1/ /IM01/ /IM04/	The value is calculated using data from the database and survey results. *Verifier´s action:* The data applied in the equation to determine the value is reviewed and cross checked with the input values and are consistent. The calculation and data applied were reviewed for correctness. Operation personnel were interviewed for the correctness of the calculation QA procedures implemented Conclusion: Refer findings as below. VPA-1: CL C-1 and CAR C-2 VPA2: CL C-1	VPA2 ~~CL C-1~~	
D.2.3.	**$No_{p1,y}$** **VPA-1: GS1174** **VPA-2: GS5303**		**Cumulative number of project technologies included in the project database for project scenario p in year y**		
a) Measurement / Determination method (VVS, §§ 363-367) *Describe how the monitoring parameter was measured / determined. Focus primarily on the original data level (ODL) but also describe the applied data aggregation trails (from ODL to data aggregation level zero (DAL0)).* *Check if relevant equipment has been exchanged and if in cases of failures / downtimes of standard*		/MRVPA1/ /MRVPA2/ /ERVAP1/ /ERVPA2/	*Description:* The number of units installed as at 31/12/2018 for VPA-1 is 20,253 and 3,450 for VPA-2. The data is derived from the installation reports submitted by the provincial offices to Jakarta office. *Verifier´s action:* The project database was reviewed and cross-checked with the selected household inspected during onsite to confirm the data in the database are correct.	OK	OK OK

equipment other measurement / determination methods have been used. Furthermore, verify the frequency of measurements as per the requirements. Assess whether the measurement / determination method is in line with the registered monitoring plan of the PDD and the applied methodology.		/VAP1DB/ /VAP2DB/ /IM01/ /IM02/ /IM04/	The provincial personnel were interviewed on the installation reports submission to Jakarta office. The data applied in ER spreadsheet was cross-checked with the database. *Conclusion:* The parameter is monitored in accordance to the registered VPA-DD and applied methodology.		
b) Accuracy, correctness and QA/QC Procedure (VVS, §§ 368-374) *In case of measured (or estimated) values, check whether the accuracy of equipment used for monitoring is controlled and calibrated in accordance with the monitoring plan or if significant inaccuracies occur; in this case, make sure that the most conservative assumptions theoretically possible have been made for calculating ERs.* *Describe whether all applicable QA/QC procedures are met. Assess further if the calibration of the monitoring equipment has been carried out in line with the latest EB guidance.* *Include calibration dates and information in validity of the installed monitoring equipment in the table in Appendix 6.*		/MRVPA1/ /MRVPA2/ /ERVAP1/ /ERVPA2/ /VAP1DB/ /VAP2DB/ /IM01/ /IM04/ /QA1/	*Description:* The parameter is not measured and based on the input data from the provincial office for the number of units installed each month. The value is calculated using data from the database and survey results. *Verifier´s action:* The data applied in the ER spreadsheet was verified with database for consistency and correctness. Operation personnel were interviewed for the input data to the database. QA procedures implemented. *Conclusion:* The reported value is consistent with the database.	OK	OK
D.2.4. $O_{p1,y}$	**VPA-1: GS1174** **VPA-2: GS5303**		**The average technology-days during which the biodigesters are operational for project scenario p1 against baseline scenario b1 in year y**		

a) Measurement / Determination method (VVS, §§ 363-367) *Describe how the monitoring parameter was measured / determined. Focus primarily on the original data level (ODL) but also describe the applied data aggregation trails (from ODL to data aggregation level zero (DAL0)).* *Check if relevant equipment has been exchanged and if in cases of failures / downtimes of standard equipment other measurement / determination methods have been used. Furthermore, verify the frequency of measurements as per the requirements.* *Assess whether the measurement / determination method is in line with the registered monitoring plan of the PDD and the applied methodology.*	/MRVAP1/ /MRVPA2/ /GSM/ /BUS/ /VAP1DB/ /VPA2DB/ /ERVPA1/ /ERVPA2/ /O6/ /VPA1DD/ VPA2DD/	*Description:* The data is calculated using the number of days with the expected number of household digesters not in operation. Based on the operation memo dated 01/05/2014, when a report from the householder is received, the provincial technician must visit the household with 15 days to inspect the cause of non-operation. Should there is a delay in the reporting for more than 15 days, the digester will be considered as out of operation. During this monitoring period, there were 1,271 households from VPA-1 and 375 households from VPA-2 reported digesters were out of operation. For this monitoring period, the calculated number of days for the total number of installed digesters in operation is 364.06 days for VPA-1 and 363.37 for VPA-2. *Verifier´s action:* The memo was reviewed that states the 15 days grace period and after which the digester is considered as non-operation. The survey report was reviewed to crosscheck on the number of households digesters non-operation were replicated and considered correct. The ER spreadsheet was reviewed to crosscheck on the operation days applied. *Conclusion:* The parameter is monitored according to the registered VPA-DD and applied methodology. VPA1: CAR C-3	VPA1 ~~CAR C-3~~	OK

b) Accuracy, correctness and QA/QC Procedure (VVS, §§ 368-374) *In case of measured (or estimated) values, check whether the accuracy of equipment used for monitoring is controlled and calibrated in accordance with the monitoring plan or if significant inaccuracies occur; in this case, make sure that the most conservative assumptions theoretically possible have been made for calculating ERs.* *Describe whether all applicable QA/QC procedures are met. Assess further if the calibration of the monitoring equipment has been carried out in line with the latest EB guidance.* *Include calibration dates and information in validity of the installed monitoring equipment in the table in Appendix 6.*		/MRVPA1/ /MRVPA2/ /ERVPA1/ /ERVPA2/ /QA1/ /BUS/ /VAP1DB/ /VPADB2/ /IM01/ /IM04/ /VPA1DD/ /VPA2DD/	*Description:* The data is calculated and not measured by any instrument. The value is calculated using data from the database and survey results. *Verifier´s action:* During the onsite, the operational personnel and project advisor were interviewed on the approach the data is calculated. The survey report, survey and project database were reviewed to crosscheck on the data applied to determine the average number of operational days per year. The calculation and data applied were reviewed for correctness. Operation personnel were interviewed for the correctness of the calculation. Operation manual is implemented *Conclusion:* The data is determined in accordance to registered VPA-DD. Refer VPA1: CAR C-3	VPA1 ~~CAR C-3~~	OK
D.2.5. $LE_{p1,y}$	**VPA-1: GS1174** **VPA-2: GS5303**		**Leakage in project scenario p during year y**		

a) Measurement / Determination method (VVS, §§ 363-367) *Describe how the monitoring parameter was measured / determined. Focus primarily on the original data level (ODL) but also describe the applied data aggregation trails (from ODL to data aggregation level zero (DAL0)).* *Check if relevant equipment has been exchanged and if in cases of failures / downtimes of standard equipment other measurement / determination methods have been used. Furthermore, verify the frequency of measurements as per the requirements.* *Assess whether the measurement / determination method is in line with the registered monitoring plan of the PDD and the applied methodology.*	/MRVPA 1/ /MRVPA 2/ /L1/ /ERVAP1 / ERVPA2/ /VPA1DD / /VPA2DD /GSM/	*Description:* According to the registered VPA-DDs, the parameter will be monitored once every two years using survey methods to meet the requirements of the applied methodology. A survey was conducted from in December 2017 by the 3rd party consultant to obtain the leakage for usage of biomass generally firewood. The leakage is for the use of non-renewable biomass in the project scenario generally firewood as fuel substitution in the monitoring period. For this monitoring period, the leakage for VPA1 CPI is 0.037 tCO_2e, VPA1 CPII is 0.033 tCO_2e and VPA2 is 0.037 tCO_2e. *Verifier´s action:* The survey report was reviewed that indicates a leakage of 4.58%. The reported value in the MR and ER spreadsheet was cross-checked for consistency applied in the leakage calculation *Conclusion:* The parameter is monitored according to the registered VPA-DDs and applied methodology. Refer VPA1: CAR C-3 raised	VPA1 ~~CAR C-3~~	OK
b) Accuracy, correctness and QA/QC Procedure (VVS, §§ 368-374) *In case of measured (or estimated) values, check whether the accuracy of equipment used for monitoring is controlled and calibrated in accordance with the monitoring plan or if significant inaccuracies*	/MRVPA 1/ MRVPA2 / /L1/	*Description:* The parameter is monitored by means of survey once every 2 years. A survey was conducted in December 2017 by the 3rd party consultant to obtain the leakage for usage of firewood. The parameter is monitored by means of survey once every 2 years	VPA1 ~~CAR C-3~~	OK

occur; in this case, make sure that the most conservative assumptions theoretically possible have been made for calculating ERs. *Describe whether all applicable QA/QC procedures are met. Assess further if the calibration of the monitoring equipment has been carried out in line with the latest EB guidance.* *Include calibration dates and information in validity of the installed monitoring equipment in the table in Appendix 6.*		/VPA1DD/ /VPA2DD/ /GSM/	*Verifier´s action:* The survey report was reviewed that indicates a leakage 2% and 4.58% for usage of firewood. *Conclusion:* The parameter is monitored in accordance to registered VPA-DD and applied methodology. Refer VPA1 CR C-3.		
D.2.6. $N_{T,h}$	**VPA-1: GS1174** **VAP-2: GS5303**		**Number of animals of livestock category T in premise h**		
a) Measurement / Determination method (VVS, §§ 363-367) *Describe how the monitoring parameter was measured / determined. Focus primarily on the original data level (ODL) but also describe the applied data aggregation trails (from ODL to data aggregation level zero (DAL0)).* *Check if relevant equipment has been exchanged and if in cases of failures / downtimes of standard equipment other measurement / determination methods have been used. Furthermore, verify the frequency of measurements as per the requirements.* *Assess whether the measurement / determination method is in line with the registered monitoring plan of the PDD and the applied methodology.*		/MRVPA1/ /MRVPA2/ /VPA1DB/ /VPA2DB/ /BUS/ /VPA1DD/ VPA2DD/ /GSM/ /ERVPA1/	*Description:* The data for the number of animals for each category is derived from the biogas usage survey report. For this monitoring period, the average number of animals per household as below: VPA1: Dairy cows: 5,87 Market Swine: 0. VPA2"Dairy cows: 4.78; Market Swine: 0. *Verifier´s action:* The data applied in the ER spreadsheet was cross-checked with the data from the survey report and primary BUS spreadsheet *Conclusion:* The parameter is monitored in accordance with the registered VPA-DD and applied methodology. Refer VPA2: CAR C-5	VPA2 ~~CAR C-5~~	OK OK

		/ERVPA2/			
b) Accuracy, correctness and QA/QC Procedure (VVS, §§ 368-374) *In case of measured (or estimated) values, check whether the accuracy of equipment used for monitoring is controlled and calibrated in accordance with the monitoring plan or if significant inaccuracies occur; in this case, make sure that the most conservative assumptions theoretically possible have been made for calculating ERs.* *Describe whether all applicable QA/QC procedures are met. Assess further if the calibration of the monitoring equipment has been carried out in line with the latest EB guidance.* *Include calibration dates and information in validity of the installed monitoring equipment in the table in Appendix 6.*		/MRVPA1/ /ERVPA2/ /BUS/ /VAP1DB/ VPA2DB/ /ERVPA1/ /ERVPA2/ /QA1/ /IM01/ /IM02.	*Description:* The parameter is based on survey results and not measured by any instruments. The data is derived from survey conducted *Verifier´s action:* The survey data was reviewed and cross-checked with the data applied in the ER spreadsheets for correctness Operational manual implemented. *Conclusion:* The data is the MR is consistent with the survey results. Refer VAP2 CAR C-5 raised.	VPA2 ~~CAR C-5~~	OK OK
D.2.7. PL	**VPA-1: GS1174** **VPA-2: GS5303**		**Physical leakage of the biodigester**		
a) Measurement / Determination method (VVS, §§ 363-367) *Describe how the monitoring parameter was measured / determined. Focus primarily on the original*		/MRVPA1/	*Description:* A default value of the 10% is applied for this parameter The value is derived from the registered VPA-DD section B.6.1.	OK	OK

data level (ODL) but also describe the applied data aggregation trails (from ODL to data aggregation level zero (DAL0)). *Check if relevant equipment has been exchanged and if in cases of failures / downtimes of standard equipment other measurement / determination methods have been used. Furthermore, verify the frequency of measurements as per the requirements.* *Assess whether the measurement / determination method is in line with the registered monitoring plan of the PDD and the applied methodology.*	/MRVPA2/ /ERVAP1/ /ERVPA2/ /VPADD1/ /VPA2DD/ /GSM/	*Verifier´s action:* Review MR against registered VPA-DD and data applied in ER spreadsheet. *Conclusion:* The parameter is monitored in accordance with the registered VPA-DD and applied methodology.		
b) Accuracy, correctness and QA/QC Procedure (VVS, §§ 368-374) *In case of measured (or estimated) values, check whether the accuracy of equipment used for monitoring is controlled and calibrated in accordance with the monitoring plan or if significant inaccuracies occur; in this case, make sure that the most conservative assumptions theoretically possible have been made for calculating ERs.* *Describe whether all applicable QA/QC procedures are met. Assess further if the calibration of the monitoring equipment has been carried out in line with the latest EB guidance.* *Include calibration dates and information in validity of the installed monitoring equipment in the table in Appendix 6.*	/MRVPA1/ /MRVPA2/ /ERVPA1/ /ERVPA2/ /VPA1DD/ /VPA2DD/ /GSM/ /QA1/	*Description:* A default value is applied for this parameter and no measurement is conducted by any instruments. The data for this parameter is a default value from the registered VPA-DD. *Verifier´s action:* The data applied in ER spreadsheet was crosschecked with the registered VPA-DD and applied methodology. The value stated in MR and ER spreadsheet was reviewed for correctness. Operational manual implemented *Conclusion:* The value applied is a default value derived from registered VPA-DD.	OK	OK

D.2.8. $BB_{b1,bio}$	**VPA-1: GS1174** **VPA-2: GS5303**		**Amount of woody biomass used in the baseline scenario 1: households**		
a) Measurement / Determination method (VVS, §§ 363-367) *Describe how the monitoring parameter was measured / determined. Focus primarily on the original data level (ODL) but also describe the applied data aggregation trails (from ODL to data aggregation level zero (DAL0)).* *Check if relevant equipment has been exchanged and if in cases of failures / downtimes of standard equipment other measurement / determination methods have been used. Furthermore, verify the frequency of measurements as per the requirements.* *Assess whether the measurement / determination method is in line with the registered monitoring plan of the PDD and the applied methodology.*		/MRVPA 1/ /MRVPA 2 /ERVPA1 / /ERVPA2 / /BUS/ /KPT/ /VPA1DD / /VPA2DD / /GSM/ /LHH/	*Description:* The amount of woody biomass used by the households in the baseline scenario is based on the KPT conducted once in every 2 years. The last KPT test was conducted between 14/12/2017 to 24/12/2017 and applicable for this monitoring period. The woody biomass is firewood in the baseline scenario. *Verifier´s action:* The data in the ER was cross-checked with the results from the KPT primary data and analysis for consistency. During the onsite inspection, it could be confirmed firewood is the woody biomass used prior to the bio-digester is installed. *Conclusion:* The parameter is monitored in accordance with the registered VPA-DD and applied methodology	OK	OK

b) Accuracy, correctness and QA/QC Procedure (VVS, §§ 368-374) *In case of measured (or estimated) values, check whether the accuracy of equipment used for monitoring is controlled and calibrated in accordance with the monitoring plan or if significant inaccuracies occur; in this case, make sure that the most conservative assumptions theoretically possible have been made for calculating ERs.* *Describe whether all applicable QA/QC procedures are met. Assess further if the calibration of the monitoring equipment has been carried out in line with the latest EB guidance.* *Include calibration dates and information in validity of the installed monitoring equipment in the table in Appendix 6.*		/MRVPA1/ /MRVPA2/ /ERVPA1/ /ERVPA2/ /BUS/ /QA1/ /GSM/ /VPA1DD/ /VPA2DD/ /IM01/ /IM04/	*Description:* The parameter is monitored by means of KPT conducted once every 2 years. *Verifier´s action:* The KPT report was reviewed for consistency with the data applied in ER spreadsheet for correctness. Operational manual implemented and operational personnel interviewed. *Conclusion:* The parameter is monitored in accordance to registered VPA-DD and applied methodology.	OK	OK
D.2.9. $BB_{b1,fuel}$	**VPA-1: GS1174** **VPA-2: GS5303**		**Amount of fossil fuels used in the baseline scenario 1: households**		
a) Measurement / Determination method (VVS, §§ 363-367) *Describe how the monitoring parameter was measured / determined. Focus primarily on the original*		/MRVPA1/ /MRVPA2/	*Description:* The amount of fossil fuel used by the households in the baseline scenario is based on the KPT conducted once in every 2 years.	OK	OK

data level (ODL) but also describe the applied data aggregation trails (from ODL to data aggregation level zero (DAL0)). *Check if relevant equipment has been exchanged and if in cases of failures / downtimes of standard equipment other measurement / determination methods have been used. Furthermore, verify the frequency of measurements as per the requirements.* *Assess whether the measurement / determination method is in line with the registered monitoring plan of the PDD and the applied methodology.*	/ERVPA1/ /ERVPA2/ /BUS/ /VPA1DD/ /VPA2DD/ /GSM/ /KPT/	The last KPT was conducted between 14/12/2017 to 24/12/2017 and applicable for this monitoring period. The fossil fuel used in the baseline scenario is LPG. *Verifier´s action:* The data in the ER was cross-checked with the results from the KPT primary data and analysis for consistency. During the onsite inspection, it was found the household does not used LPG since they have sufficient biogas for cooking *Conclusion:* The parameter is monitored in accordance with the registered VPA-DD and applied methodology		
b) Accuracy, correctness and QA/QC Procedure (VVS, §§ 368-374) *In case of measured (or estimated) values, check whether the accuracy of equipment used for monitoring is controlled and calibrated in accordance with the monitoring plan or if significant inaccuracies occur; in this case, make sure that the most conservative assumptions theoretically possible have been made for calculating ERs.* *Describe whether all applicable QA/QC procedures are met. Assess further if the calibration of the*	/MRVPA1/ /MRVPA2/ /ERVPA1/ /ERVPA2/ /BUS/	*Description:* The parameter is monitored by means of KPT once every 2 years. The data for this parameter is derived from the KPT conducted once every 2 years *Verifier´s action:* The KPT report was reviewed for consistency with the data applied in ER spreadsheet for correctness. Operational manual implemented and operational personnel interviewed.	OK	OK

monitoring equipment has been carried out in line with the latest EB guidance. *Include calibration dates and information in validity of the installed monitoring equipment in the table in Appendix 6.*		/QA1/ /KPT/ /GSM/ /VPA1DD/ /VPA2DD/ /IM01/ /IM04/	*Conclusion:* The parameter is monitored in accordance to registered VPA-DD and applied methodology.		
D.2.10. $BB_{p1,fuel}$	**VPA-1: GS1174** **VPA-2: GS5303**		**Quantity of fossil fuel consumed in project scenario 1 during year y, in tonnes**		
a) Measurement / Determination method (VVS, §§ 363-367) *Describe how the monitoring parameter was measured / determined. Focus primarily on the original data level (ODL) but also describe the applied data aggregation trails (from ODL to data aggregation level zero (DAL0)).* *Check if relevant equipment has been exchanged and if in cases of failures / downtimes of standard equipment other measurement / determination methods have been used. Furthermore, verify the frequency of measurements as per the requirements.*		/MRVPA1/ /MRVPA2/ /ERVPA1/ /ERVPA2/ /BUS/ /VPA1DD/	*Description:* The quantity of fossil fuel used by the households in the project scenario is based on the KPT conducted once in every 2 years. The last KPT test was conducted between 14/12/2017 to 24/12/2017 and applicable for this monitoring period. The fossil fuel in the project scenario is LPG. *Verifier´s action:* The data in the ER was cross-checked with the results from the KPT primary data and analysis for consistency. During the onsite inspection, it was found LPG is no longer used by the households for cooking	OK	OK

Assess whether the measurement / determination method is in line with the registered monitoring plan of the PDD and the applied methodology.		/VPA2DD /GSM/ /LHH/	*Conclusion:* The parameter is monitored in accordance with the registered VPA-DD and applied methodology.		
b) Accuracy, correctness and QA/QC Procedure (VVS, §§ 368-374) *In case of measured (or estimated) values, check whether the accuracy of equipment used for monitoring is controlled and calibrated in accordance with the monitoring plan or if significant inaccuracies occur; in this case, make sure that the most conservative assumptions theoretically possible have been made for calculating ERs.* *Describe whether all applicable QA/QC procedures are met. Assess further if the calibration of the monitoring equipment has been carried out in line with the latest EB guidance.* *Include calibration dates and information in validity of the installed monitoring equipment in the table in Appendix 6.*		/MRVPA1/ /MRVPA2/ /ERVPA1/ /ERVPA2/ /BUS/ /QA1/ /VPA1DD/ /VPA2DD/ /GSM/ /IM01/ /IM04/	*Description:* The parameter is monitored by means of KPT conducted once every 2 years. *Verifier´s action:* The KPT report was reviewed for consistency with the data applied in ER spreadsheet for correctness Operational manual implemented and operational personnel interviewed. *Conclusion:* The parameter is monitored in accordance to registered VPA-DD and applied methodology.	OK	OK
D.2.11. $BB_{p1,bio}$	**VPA-1: GS1174** **VPA-2: GS5303**		**Quantity of biomass consumed in project scenario p during year y, in tonnes**		

a) Measurement / Determination method (VVS, §§ 363-367) *Describe how the monitoring parameter was measured / determined. Focus primarily on the original data level (ODL) but also describe the applied data aggregation trails (from ODL to data aggregation level zero (DAL0)).* *Check if relevant equipment has been exchanged and if in cases of failures / downtimes of standard equipment other measurement / determination methods have been used. Furthermore, verify the frequency of measurements as per the requirements.* *Assess whether the measurement / determination method is in line with the registered monitoring plan of the PDD and the applied methodology.*	/MRVPA 1/ /MRVPA 2/ /ERVPA1 / /ERVPA2 / /BUS/ /VPA1DD / /VPA2DD / /KPT/ /GSM/	*Description:* The quantity of biomass used by the households in the project scenario is measured by means of KPT conducted once in every 2 years. The last KPT test was conducted between 14/12/2017 to 24/12/2017 and applicable for this monitoring period. The biomass consumed in the project scenario is firewood. *Verifier´s action:* The data in the ER was cross-checked with the results from the KPT primary data and analysis for consistency. During the onsite inspection, it could be confirmed firewood is used by households to boil water for business and cooking during festive period or celebration. *Conclusion:* The parameter is monitored in accordance with the registered VPA-DD and applied methodology.	OK	OK
b) Accuracy, correctness and QA/QC Procedure (VVS, §§ 368-374) *In case of measured (or estimated) values, check whether the accuracy of equipment used for monitoring is controlled and calibrated in accordance with the monitoring plan or if significant inaccuracies occur; in this case, make sure that the most conservative assumptions theoretically possible have been made for calculating ERs.*	/MRVPA 1/ /MRVPA 2 /ERVPA1 / /ERVPA2 /	*Description:* The parameter is monitored by means of KPT conducted once every 2 years. *Verifier´s action:* The KPT report was reviewed for consistency with the data applied in ER spreadsheet. Operational manual implemented and operational personnel interviewed.	OK	OK

Describe whether all applicable QA/QC procedures are met. Assess further if the calibration of the monitoring equipment has been carried out in line with the latest EB guidance. *Include calibration dates and information in validity of the installed monitoring equipment in the table in Appendix 6.*		/BUS/ /QA1/ /KPT/ /GSM/ /VPA1DD/ /VPA2DD/	The value stated in MR and ER spreadsheet was reviewed and compared with the KPT data and analysis for correctness *Conclusion:* The parameter is monitored in accordance to registered VPA-DD and applied methodology.		
D.2.12.	**$MS_{P,S,K}$** **VPA-1: GS1174** **VPA-2: GS5303**		**Fraction of livestock category T's manure not treated in bio-digester, in climate region k**		
a) Measurement / Determination method (VVS, §§ 363-367) *Describe how the monitoring parameter was measured / determined. Focus primarily on the original data level (ODL) but also describe the applied data aggregation trails (from ODL to data aggregation level zero (DAL0)).* *Check if relevant equipment has been exchanged and if in cases of failures / downtimes of standard equipment other measurement / determination methods have been used. Furthermore, verify the frequency of measurements as per the requirements.* *Assess whether the measurement / determination method is in line with the registered monitoring plan of the PDD and the applied methodology.*		/MRVPA1/ /MRVPA2/ /BUS/ /ERVPA1/ /ERVPA2 /VPA1DD/ /VAP2DD/ /GSM/	*Description:* The fraction of manure not treated in the biodigesters for respective animal category as follows: VPA1: Category T | % Dairy cow | 19.0 Market Swine | 0 VPA2: Category T | % Dairy cow | 22.0 Market Swine | 0 The data was derived from the usage survey conducted by an independent consultant.	OK	OK

			Verifier´s action: The usage survey database was reviewed and cross-checked with the date applied in the ER spreadsheet for consistency *Conclusion:* The parameter is monitored according to the registered VPA-DD and applied methodology.		
b) Accuracy, correctness and QA/QC Procedure (VVS, §§ 368-374) *In case of measured (or estimated) values, check whether the accuracy of equipment used for monitoring is controlled and calibrated in accordance with the monitoring plan or if significant inaccuracies occur; in this case, make sure that the most conservative assumptions theoretically possible have been made for calculating ERs.* *Describe whether all applicable QA/QC procedures are met. Assess further if the calibration of the monitoring equipment has been carried out in line with the latest EB guidance.* *Include calibration dates and information in validity of the installed monitoring equipment in the table in Appendix 6.*		/MRVPA 1/ /MRVPA 2/ /BUS/ /ERVPA1 / /ERVPA2 /QA1/ //IM01/ /IM02/	*Description:* The data is calculated based on the usage survey results and no instrument is used. *Verifier´s action:* The data applied in ER spreadsheet was cross-checked with the usage survey results for consistency and correctness Operational manual implemented and operational personal interviewed. *Conclusion:* The data in ER spreadsheet is consistent with the usage survey database.	OK	OK
D.2.13. $MS_{T,S,K}$	**VPA-1: GS1174** **VPA-2: GS5303**		**Fraction of livestock category T's manure fed into the bio-digester, S in climate region k**		

<table>
<tr>
<td>a) Measurement / Determination method (VVS, §§ 363-367)
Describe how the monitoring parameter was measured / determined. Focus primarily on the original data level (ODL) but also describe the applied data aggregation trails (from ODL to data aggregation level zero (DAL0)).
Check if relevant equipment has been exchanged and if in cases of failures / downtimes of standard equipment other measurement / determination methods have been used. Furthermore, verify the frequency of measurements as per the requirements.
Assess whether the measurement / determination method is in line with the registered monitoring plan of the PDD and the applied methodology.</td>
<td>/MRVPA 1/
/MRVAP 2
/BUS/
/ERVPA1 /
/ERVPA2 /
/VPA1DD /
/\/PA2DD /
/GSM/</td>
<td>Description:
The fraction of manure fed in the biodigesters for respective animal category as follows:
VPA1:<table><tr><td>Category T</td><td>%</td></tr><tr><td>Dairy cow</td><td>81</td></tr><tr><td>Market Swine</td><td>0</td></tr></table>VPA2:<table><tr><td>Category T</td><td>%</td></tr><tr><td>Dairy cow</td><td>78</td></tr><tr><td>Market Swine</td><td>0</td></tr></table>The data was derived from the usage survey conducted by an independent consultant.
Verifier´s action:
The usage survey database was reviewed and cross-checked with the date applied in the ER spreadsheet for consistency.
Conclusion:
The parameter is monitored according to the registered VPA-DD and applied methodology.</td>
<td>~~CAR D4~~</td>
<td>OK</td>
</tr>
<tr>
<td>b) Accuracy, correctness and QA/QC Procedure (VVS, §§ 368-374)
In case of measured (or estimated) values, check whether the accuracy of equipment used for</td>
<td>/MRVPA 1/</td>
<td>Description:
The data is calculated based on the usage survey results and no instrument is used.</td>
<td>OK</td>
<td>OK</td>
</tr>
</table>

monitoring is controlled and calibrated in accordance with the monitoring plan or if significant inaccuracies occur; in this case, make sure that the most conservative assumptions theoretically possible have been made for calculating ERs. *Describe whether all applicable QA/QC procedures are met. Assess further if the calibration of the monitoring equipment has been carried out in line with the latest EB guidance.* *Include calibration dates and information in validity of the installed monitoring equipment in the table in Appendix 6.*		/MRVPA 2/ /BUS/ /ERVPA1 / /ERVPA2 / /QA1/ /IM01/ /IM02/	*Verifier´s action:* The data applied in ER spread-sheet was cross-checked with the usage survey results for consistency and correctness. Operational manual implemented and operational personal interviewed. *Conclusion:* The data in ER spread-sheet is consistent with the usage survey database.		
D.2.14. GWP_{CH4}	**VPA-1: GS1174** **VPA-2: GS5303**		**Global Warming Potential of methane**		
a) Measurement / Determination method (VVS, §§ 363-367) *Describe how the monitoring parameter was measured / determined. Focus primarily on the original data level (ODL) but also describe the applied data aggregation trails (from ODL to data aggregation level zero (DAL0)).* *Check if relevant equipment has been exchanged and if in cases of failures / downtimes of standard equipment other measurement / determination methods have been used. Furthermore, verify the frequency of measurements as per the requirements.* *Assess whether the measurement / determination method is in line with the registered monitoring plan of the PDD and the applied methodology.*		/MRVPA 1/ /MRVPA 2 /ERVPA1 / /IPC /ERVPA2 /C/ /VPA1DD / /GSM/	*Description:* The GWP is the methane content applicable during the monitoring period is 25 for emissions generated as from 01/01/2013. *Verifier´s action:* The GWP data applied in the MR and ER spread-sheet were verified with 2006 IPCC for consistency *Conclusion:* The parameter is monitored in accordance to the registered VPA-DD and applied methodology.	OK	OK

		/VPA2DD/			
b) Accuracy, correctness and QA/QC Procedure (VVS, §§ 368-374) *In case of measured (or estimated) values, check whether the accuracy of equipment used for monitoring is controlled and calibrated in accordance with the monitoring plan or if significant inaccuracies occur; in this case, make sure that the most conservative assumptions theoretically possible have been made for calculating ERs.* *Describe whether all applicable QA/QC procedures are met. Assess further if the calibration of the monitoring equipment has been carried out in line with the latest EB guidance.* *Include calibration dates and information in validity of the installed monitoring equipment in the table in Appendix 6.*		/MRVPA1/ /MRVPA2 /ERVPA1/ /ERVPA2/ /IPCC/ /QA1/	*Description:* The GWP value is not measured and derived from IPCC. *Verifier´s action:* The GWP for methane applied in MR and ER spread-sheet was cross-checked with 2006 IPCC for correctness. QA procedure is implemented The value was cross-checked with IPCC for correctness *Conclusion:* The data value applied is consistent with IPCC.	OK	OK
D.2.15. Bio	**VPA-1: GS1174** **VPA-2: GS5303**		**Use of bio-slurry**		
a) Measurement / Determination method (VVS, §§ 363-367) *Describe how the monitoring parameter was measured / determined. Focus primarily on the original data level (ODL) but also describe the applied data aggregation trails (from ODL to data aggregation level zero (DAL0)).*		/MRBPA1/ /MRVPA2/ /BUS/	*Description:* The bio-slurry is used by households for grass farming and vegetables gardening activities. Based on the usage survey conducted 54% of households from VPA-1 and 64% from VPA2 apply bio-slurry for the farming and gardening activities.	OK	OK

Check if relevant equipment has been exchanged and if in cases of failures / downtimes of standard equipment other measurement / determination methods have been used. Furthermore, verify the frequency of measurements as per the requirements. Assess whether the measurement / determination method is in line with the registered monitoring plan of the PDD and the applied methodology.	/ERVPA1 / /ERVPA2 /	The PP had calculated the emission from the use of bio-slurry is per household per year for VPA1 CPI MR6 and CPII MR1 is 0.018 $tCO_2e/y/hh$, and VPA2 CPI is 0.042 $tCO_2e/y/hh$ For conservativeness, the emissions are deducted from the emissions reduction.		
		Verifier´s action: The survey result was reviewed to crosscheck on the percentage of households apply bio-slurry for farming activities. From the onsite inspection and telephone interviews of 295 households, 64% households apply bio-slurry for farming or gardening activities. The data applied in the ER spreadsheet was verified and the project emissions calculation for bio-slurry was reviewed and could conclude the emissions from bio-slurry is included in the ER calculations.		
		Conclusion: The parameter is monitored according to the registered VPA-DD and applied methodology		
b) Accuracy, correctness and QA/QC Procedure (VVS, §§ 368-374) *In case of measured (or estimated) values, check whether the accuracy of equipment used for monitoring is controlled and calibrated in accordance*	/MRVPA 1/ /MRVPA 2/	*Description:* The data was consolidated from the usage survey results and no equipment was involved in monitoring. The data was calculated using data from the usage survey results	OK	OK

with the monitoring plan or if significant inaccuracies occur; in this case, make sure that the most conservative assumptions theoretically possible have been made for calculating ERs. *Describe whether all applicable QA/QC procedures are met. Assess further if the calibration of the monitoring equipment has been carried out in line with the latest EB guidance.* *Include calibration dates and information in validity of the installed monitoring equipment in the table in Appendix 6.*		/BUS/ /ERVPA1/ /ERVPA2/ /QA1/	*Verifier´s action:* The usage survey results were reviewed. The calculation in the ER spreadsheet was reviewed and crosscheck with the survey results for consistency. The emissions from Bio-slurry is included in the ER calculation as PE. Operation manual procedure implemented and operation personnel interviewed. *Conclusion:* By mean of document review, the calculation for project emissions from usage of bio-slurry is determined correctly.		
D.3. SD Indicators Monitored					
D.3.1. GS-03:	**VPA-1: GS1174** **VPA-2: GS5303**		**Soil condition**		
a) Measurement / Determination method GS Annex I, GS Annex AC, GS Annex G) *Describe how the monitoring parameter was measured / determined. Focus primarily on the registered VPA-DD and GS Passport and check what has been achieved relative to the baseline scenario.* *Furthermore, verify the frequency of measurements as per the requirements.*		/MRVPA1/ /MRVPA2/ /BUS/ /ERVPA1/ /ERVPA2/	*Description:* The number of households used bio-slurry for farming activities reported was 54% for VPA1 and 64% for VPA2. The data was derived from the Biogas Usage Survey. *Verifier´s action:* The usage survey report was reviewed and cross-check during the site inspection and telephone interviews that 295, approx. 64% of the randomly selected households apply bio-slurry for farming activities	OK	OK

Assess whether the measurement / determination method is in line with the registered monitoring plan of the VPA-DD and relevant GS Annexes.		/LHH/	*Conclusion:* The monitoring of the indicator is consistent with the GS Passport. Refer CAR F1 raised for both VPAs.		
b) Correctness and Scoring *Determine whether the monitoring method/value given in the sustainability monitoring report is correct or determined in a conservative manner.* *In case of conservative approaches used in lieu of the monitoring as per registered passport detailed assessment of the conservativeness of the approach used should be given.* *Score in accordance to Toolkit Annex I* *In case of mistakes / deviations pl. provide details and descriptions of the CARs raised.*		/MRVPA 1/ /MRVPA 2/ /BUS/ /ERVPA1 / /ERVPA2 / /LHH/	*Description:* The value of the data in the monitoring report was based on the survey report. *Verifier´s action:* The survey report was reviewed and compared with the results of the onsite inspection and telephone interviews conducted by the verification team for the usage of bio-slurry for farming *Conclusion:* The data of the survey is correct *Score:* The number of households using bio slurry as fertilizers for their farming activities for this monitoring period as compared to the baseline scenario is zero. Therefore, the score is positive as per the Toolkit 2.1 Annex I.	OK	OK
D.3.2. GS-06:	**VPA-1: GS1174** **VPA-2: GS5303**		**Quality of employment**		
a) Measurement / Determination method ***VVS, §§ 389, 393, GS Annex I, GS Annex AC, GS Annex G)***		/MRVPA 1/ /MRVPA 2/	*Description:* The number of vocational training conducted during the monitoring period was 1,382 for VPA-1 and 51 for VPA-2.	OK	OK

Describe how the monitoring parameter was measured / determined. Focus primarily on the registered VPA-DD and GS Passport and check what has been achieved relative to the baseline scenario. *Furthermore, verify the frequency of measurements as per the requirements.* *Assess whether the measurement / determination method is in line with the registered monitoring plan of the VPA-DD and relevant GS Annexes.*	/VAP1DB/ /VPA2DB/ /IM04/	There is no change for VPA-1 since the VPA has stopped installing digesters as from 31/12/2016. The monitoring of such number of training conducted was by means of reporting by the provincial offices to the central office where the data is processed and captured in the project database. *Verifier´s action:* The training records in the project database were verified and confirmed through interviews with the provincial officials and supervisors during the site visit. *Conclusion:* The monitoring of the indicator is consistent with the GS Passport.		
b) Correctness and Scoring *Determine whether the monitoring method/value given in the sustainability monitoring report is correct or determined in a conservative manner.* *In case of conservative approaches used in lieu of the monitoring as per registered passport detailed assessment of the conservativeness of the approach used should be given.* *Score in accordance to Toolkit Annex I* *In case of mistakes / deviations pl. provide details and descriptions of the CARs raised.*	/MRVPA1/ MRVPA2/ /VPA1DB/ /VPA2DB/ /IM01/ /IM04/	*Description:* The data is monitored by means of keeping track of the number vocational training and captured in the project database. *Verifier´s action:* The database and training records were verified during onsite and interviewed conducted *Conclusion:* The data can be cross-checked for correctness. *Score:* The number of vocational training conducted for this monitoring period as compared to the baseline scenario is zero.	OK	OK

<table>
<tr><td colspan="2"></td><td></td><td>Therefore, the score is positive as per the Toolkit 2.1 Annex I.</td><td></td><td></td></tr>
<tr><td>D.3.3. GS-07:</td><td>VPA1: GS1174
VPA-2: GS5303</td><td></td><td>Livelihood of the poor</td><td></td><td></td></tr>
<tr><td colspan="2">a) Measurement / Determination method
VVS, §§ 389, 393, GS Annex I, GS Annex AC, GS Annex G)
Describe how the monitoring parameter was measured / determined. Focus primarily on the registered VPA-DD and GS Passport and check what has been achieved relative to the baseline scenario.
Furthermore, verify the frequency of measurements as per the requirements.
Assess whether the measurement / determination method is in line with the registered monitoring plan of the VPA-DD and relevant GS Annexes .</td><td>/MRVPA1/
MRVPA2/
/BUS/
/ERVPA1/
/ERVPA2/
/VPA2DB/
/VPA2DB/
/LHH/
/IM03/</td><td>Description:
The improvement to the living conditions of the households with the installation of the bio-digesters was based on the usage survey conducted by an independent 3rd party.
During this monitoring period, the reported data as below:
<table><tr><th>VPA</th><th>Improved</th><th>Same</th><th>Worsened</th></tr><tr><td>VPA-1</td><td>16,336</td><td>3,917</td><td>0</td></tr><tr><td>VPA-2</td><td>2,721</td><td>729</td><td>0</td></tr></table>Verifier´s action:
The usage survey report and records was verified.
During the onsite visits, households were interviewed and could confirm the improvement in the living conditions with the installation of digester.
Conclusion:
The monitoring of the indicator is consistent with the GS Passport.</td><td>OK</td><td>OK</td></tr>
</table>

b) Correctness and Scoring *Determine whether the monitoring method/value given in the sustainability monitoring report is correct or determined in a conservative manner.* *In case of conservative approaches used in lieu of the monitoring as per registered passport detailed assessment of the conservativeness of the approach used should be given.* *Score in accordance to Toolkit Annex I* *In case of mistakes / deviations pl. provide details and descriptions of the CARs raised.*		/MRVPA 1/ /MRVPA 2/ /BUS/ /ERVPA1 / /ERVPA2 / /LHH/	*Description:* The data is monitored by means of usage survey. *Verifier´s action:* The survey report was reviewed and onsite inspection could confirm the improvement of the living conditions. *Conclusion:* The database was verified and are consistent. *Score:* The number of households reported improvement to living conditions for this monitoring period as compared to the baseline scenario is zero. Therefore, the score is positive as per the Toolkit 2.1 Annex	OK	OK
D.3.4. GS-08:	**VPA-1: GS1174** **VPA-2: GS5303**		**Access to affordable and clean energy services**		
a) Measurement / Determination method ***VVS, §§ 389, 393, GS Annex I, GS Annex AC, GS Annex G)*** *Describe how the monitoring parameter was measured / determined. Focus primarily on the*		/MRVPA 1/ /MRVPA 2/ /VPA1DB /	*Description:* The number of bio-digesters implemented that benefit as at 31/12/2018 for VPA-1 20,253 units and VPA-2 3,450 units. The data is derived from the project database with the number of digesters implemented reported by the provincial offices to the central office where the data is processed and captured in the project database.	OK	OK

registered VPA-DD and GS Passport and check what has been achieved relative to the baseline scenario. *Furthermore, verify the frequency of measurements as per the requirements.* *Assess whether the measurement / determination method is in line with the registered monitoring plan of the VPA-DD and relevant GS Annexes.*		/VPA2DB/ /BUS/ /IM04/	*Verifier´s action:* The project database was reviewed and the data handling process was confirmed through interviews with the provincial officials during the site visit. *Conclusion:* The monitoring of the indicator is consistent with the GS Passport.		
b) Correctness and Scoring *Determine whether the monitoring method/value given in the sustainability monitoring report is correct or determined in a conservative manner.* *In case of conservative approaches used in lieu of the monitoring as per registered passport detailed assessment of the conservativeness of the approach used should be given.* *Score in accordance to Toolkit Annex I* *In case of mistakes / deviations pl. provide details and descriptions of the CARs raised.*		/MRVPA1/ /MRVPA2/ /VPA1DB/ /VPA2DB/ /ERVPA1/ /ERVPA2/	*Description:* The data is monitored by means of keeping track of the number digesters implemented at each province, reported and captured in the project database. *Verifier´s action:* The database was verified for correctness *Conclusion:* Data are consistent for VPA-1 and VPA-2. *Score:* The number of digesters implemented as at 31/12/2018 for VPA-1 20,253 units and VPA-2 3,450 units. as compared to the baseline scenario is zero. Therefore, the score is positive as per the Toolkit 2.1 Annex I.	OK	OK
D.3.5. GS-09:	**VPA-1: GS1174** **VPA-2: GS5303**		**Human and institutional capacity**		

a) Measurement / Determination method ***VVS, §§ 389, 393, GS Annex I, GS Annex AC, GS Annex G)*** *Describe how the monitoring parameter was measured / determined. Focus primarily on the registered VPA-DD and GS Passport and check what has been achieved relative to the baseline scenario.* *Furthermore, verify the frequency of measurements as per the requirements.* *Assess whether the measurement / determination method is in line with the registered monitoring plan of the VPA-DD and relevant GS Annexes. .*	/MRVPA 1/ /MRVPA 2/ /VPA1DB / /VPA2DB / /ERVPA1 / /ERVPA2 / /BUS/	*Description:* The number of operational and maintenance trainings conducted during the monitoring period for VPA-1 was 4,050 and VPA-2 was 774. The monitoring for such training conducted was done by means of reporting from the provincial offices to the central office where the data is processed captured in the project database. In addition, during the annual usage survey, the households women were interviewed for cross-checking on the training attended. *Verifier´s action:* The training records were verified and the data handling process was confirmed through interviews with the provincial officials and households during the site visit. The project database and usage survey records were reviewed. *Conclusion:* The monitoring of the indicator is consistent with the GS Passport. Refer CAR C-3 raised for VPA-1	VPA1 ~~CAR C-3~~	OK
b) Correctness and Scoring *Determine whether the monitoring method/value given in the sustainability monitoring report is correct or determined in a conservative manner.* *In case of conservative approaches used in lieu of the monitoring as per registered passport detailed*	/MRVPA 1/ /MRVPA 2/ /ERVPA1 /	*Description:* The data is monitored by means of keeping track of the number training conducted captured in the project database. *Verifier´s action:* The database and training records were checked by the verification team.	VPA1 ~~CAR C-3~~	OK

assessment of the conservativeness of the approach used should be given. *Score in accordance to Toolkit Annex I* *In case of mistakes / deviations pl. provide details and descriptions of the CARs raised.*		/ERVPA2/ /VPA2DB/ /VPA1DB/ /BUS/ /LHH/ /Imo4/	*Conclusion:* The data can be confirmed for correctness for VPA-2 Refer CAR C-3 raised for VPA-1 *Score:* The number of vocational training conducted for this monitoring period for VPA-1 was 4,050 and VPA-2 was 774 as compared to the baseline scenario is zero. Therefore, the score is positive as per the Toolkit 2.1 Annex I.		
D.3.6. GS-10:	**VPA-1: GS1174** **VPA-2: GS5303**		**Quantitative employment and income generation**		
a) Measurement / Determination method ***VVS, §§ 389, 393, GS Annex I, GS Annex AC, GS Annex G)*** *Describe how the monitoring parameter was measured / determined. Focus primarily on the registered VPA-DD and GS Passport and check what has been achieved relative to the baseline scenario.* *Furthermore, verify the frequency of measurements as per the requirements.* *Assess whether the measurement / determination method is in line with the registered monitoring plan of the VPA-DD and relevant GS Annexes. .*		/MRVPA1/ /MRVPA2/ /VPA1DB/ /VPA2DB/ /ERVPA1/ /ERVPA2/	*Description:* The number of employment created for this monitoring period as follows: **VPA** | **Direct Job** | **No. Households sell bio-slurry** VPA-1 | 1,509 | 607 VPA-2 | 58 | 0 The number of jobs created is derived by the project database records submitted by the provincial offices to the central office where the data is processed and keyed in the project database. The number of households who sells the bio-slurry is derived from the usage survey report.	VPA2 ~~CAR C-5~~	OK

	/BUS/ /IM01/ /IM04/	*Verifier´s action:* The employment records were reviewed and the data handling process was confirmed through interviews with the provincial officials and supervisors during the site visit. The usage survey report was reviewed to cross-checked on the number of households sells bio-slurry and interviews conducted during onsite visits. *Conclusion:* The monitoring of the indicator is consistent with the GS Passport. Refer6 CAR C-5 raised for VPA-2.		
b) Correctness and Scoring *Determine whether the monitoring method/value given in the sustainability monitoring report is correct or determined in a conservative manner.* *In case of conservative approaches used in lieu of the monitoring as per registered passport detailed assessment of the conservativeness of the approach used should be given.* *Score in accordance to Toolkit Annex I* *In case of mistakes / deviations pl. provide details and descriptions of the CARs raised.*	/MRVPA 1/ /MRVPA 2/ /BUS/ /ERVPA1 / /ERVPA2 / /LHH/ /IM04/	*Description:* The data is monitored by means of keeping track of the number employment captured in the project database. The quantity of households selling bio0slurry is based on the survey report. *Verifier´s action:* The database and survey records were verified and households interviewed. *Conclusion:* The data for VPA-1 is confirmed correct. Refer CAR C-5 raised for VPA-2 *Score:* The number of employment created and household sell bio-slurry for this monitoring period as compared to the baseline scenario is zero.	VPA2 ~~CAR C-5~~	OK

			Therefore, the score is positive as per the Toolkit 2.1 Annex I.		
D.3.7. GS-12:	**VPA-1: GS1174** **VPA-GS5303**		**Technology transfer and technological self-reliance**		
a) Measurement / Determination method ***VVS, §§ 389, 393, GS Annex I, GS Annex AC, GS Annex G)*** *Describe how the monitoring parameter was measured / determined. Focus primarily on the registered VPA-DD and GS Passport and check what has been achieved relative to the baseline scenario.* *Furthermore, verify the frequency of measurements as per the requirements.* *Assess whether the measurement / determination method is in line with the registered monitoring plan of the VPA-DD and relevant GS Annexes. .*		/MRVAP 1/ /MRVAP 2/ /ERVPA1 / /ERVPA2 / /VPA1DD /VPA2DB / /IM01/ /IM04/	*Description:* The number of operational and maintenance trainings conducted during the monitoring period for VPA-1 is 14,530 and VPA-2 is 3,235 The monitoring of such number of training conducted was done by means of reporting from the provincial offices to the central office where the data is processed and entered into the project database. *Verifier´s action:* The training records were verified and the data handling process was confirmed through interviews with the provincial officials during the site visit. The project database and training records were reviewed *Conclusion:* The monitoring of the indicator is consistent with the GS Passport. VPA-2. Refer CAR C-3 raised.	VPA1 ~~CAR C-3~~	OK
b) Correctness and Scoring		/MRVAP 1/	*Description:* The data is monitored by means of keeping track the number of training conducted and entered into the project database.	VPA2 ~~CAR C-3~~	OK

Determine whether the monitoring method value given in the sustainability monitoring report is correct or determined in a conservative manner. *In case of conservative approaches used in lieu of the monitoring as per registered passport detailed assessment of the conservativeness of the approach used should be given.* *Score in accordance to Toolkit Annex I* *In case of mistakes / deviations pl. provide details and descriptions of the CARs raised.*	/MRVAP 2/ /ERVPA1 / /ERVPA2 / /VPA1DB / /VPA2DB / /IM01/ /IM04/	*Verifier´s action:* The database and training records were checked during onsite visit for correctness *Conclusion:* No issues found for VPA-1. Refer CAR C-3 raised for VPA-2. *Score:* The number of training conducted for this monitoring period 14,530 for VPA1 and 3,235 for VPA2 as compared to the baseline scenario is zero. Therefore, the score is positive as per the Toolkit 2.1 Annex I.		
D.4. Sampling				
a) Implementation of sampling plan ***(EB75 Annex 7; D3, EB74, Annex 6)*** *Check whether the PP has applied a sampling approach to determine the monitored values (as per section D.2 above).* *If this is the case, please provide an assessment whether the PPs have correctly and sufficiently described the implemented sampling plan including:* *a) Description of the implemented sampling design* *b) Collected data* *c) Analysis of collected data*	/MR/ /GSP/ /VPA1/ /S1/ /S2/ /SSS/ /GSS/	☒ A sampling approach has been taken by the PP due to large number of implemented bio-digesters. *Description:* The sampling as described in the MR is based on GS guidelines for following data: 1. Usage Survey 2. KPT *Verifier´s action:* The Kitchen Performance Tests were conducted during this monitoring period and remain valid for two years. The verification team has checked on the sampling plan for US 287 households and considered appropriate. An addition of 10% has	VPA1 ~~CL B-1~~ ~~CL B-2,~~ ~~CL B-3~~ ~~CAR B-4~~ VPA2 ~~CAR B-1~~	OK

d) Demonstration on whether the required confidence/precision has been met (when no specific guidance in the applied methodology, 90/10 confidence/precision for SSC and 95/10 confidence/precision for LSC) and samples were representative of the population. *e) Confirmation on the application of samplings separately and independently for each of the VPAs or a sampling covering a group of VPAs is undertaken applying 95/10 confidence/precision*		been included to ensure the level of assurance and the number of households is representative. The data collected were reviewed and crosscheck during the onsite field inspection on the selected households to confirm the correctness. *Conclusion:* The sampling plan applied by the PP is incompliance to GS recommendation and according to guidelines of UNFCCC. VPA1: Refer CL B-1, CL B-2, CL B-3 and CAR B-4 raised VPA1: Refer CAR B-1 raised		
b) Sampling during verification w.r.t. the monitoring parameters ***(EB74, Annex 6, §24-29)*** *In case the VT has applied a sampling approach in the course of the verification the approach shall be described for each parameter.*	/SSP/	☒ No sampling approach has been used by the VT to verify the monitored parameters **OR**. ☐ A sampling approach has been applied by the VT for the following monitored parameter: ***Parameter: Name_of Parameter*** *Description:* *Conclusion:*	NA	NA
c) Sampling during verification w.r.t. on-site visits ***(VVS, §298)***	/MR/ /DB1/	☐ No sampling approach has been used by the VT to determine the number of VPAs or households to be visited **OR**. ☒ A sampling approach has been applied by the VT in order to determine the number of VPAs or households to be visited:	OK	OK

Explained here the sampling approach taken by the VT in order to determine the amount of VPAs that shall be visited, if applicable. *For VPAs complying with different versions of the PoA, a statistically sound sample of VPAs from each version of the PoA have to be verified.*		*Description:* The selected number of households for the onsite inspection is determined using a 90/30 rule according to the GS requirements to ensure the confidence level of 90% is achieved. The sample size was determined using the below method. http://www.raosoft.com/samplesize.html VPA-1: 52 households visited and 106 households were telephone interviewed VPA-2: 32 households visited and 105 households were telephone interviewed The inspections and interviews conducted to ensure the accuracy of the usage survey results.		
E. Calculation of Emission reductions				
E.1. Traceability ***(VVS, §§ 212, 214)*** *Assess if the calculation is fully traceable. In case of complex calculations an Excel calculation spreadsheet shall be used. All applied formulae must be visible.*	/MRCPA 1/ /MRCPA 2/ /ERVPA1 / /ERVPA2 /	The verification team has checked the emission reduction calculation and confirms that: ☐ the calculation is fully traceable ☒ all applied formulae are visible In this context the following finding has been identified: VPA-1: CAR C-4, CAR C-5, CAR C-6, CAR C-7, CAR C-9, CAR C-10, CAR C-11, CAR C-12 VPA-2: CAR C-5, CAR C-6, CAR C-7, CAR C-8, CAR C-10.	VPA-1 ~~CAR C-4~~ ~~CAR C-5~~ ~~CAR C-6~~ ~~CAR C-7~~ ~~CAR C-9~~ ~~CAR C-10~~ ~~CAR C-11~~ ~~CAR C-12~~ VPA-2 ~~CAR C-5~~	OK

			~~CAR C-6~~ ~~CAR C-7~~ ~~CAR C-8~~ ~~CAR C-10~~	
E.2. Parameter consistency ***(VVS, § 214)*** *Assess whether all internal and external parameters and data used for calculation are applied consistently in the monitoring report and the calculation spreadsheet.* *Consider only the correct data exchange between the monitoring report and the calculation spreadsheet (if any). Further ensure the consistency of notations for all parameters in the VPA-DD, MR and calculation spreadsheet.*	/MRCPA1/ /MRCPA2/ /ERVPA1/ /ERVPA2/	The verification team has checked the emission reduction calculation and the MR and confirms that: ☐ all parameter notations are consistent in the project documentation ☐ all internal and external parameters and data used for calculation are consistently applied In this context the following findings have been identified: VPA-1: CAR C-4, CAR C-5, CAR C-6, CAR C-7, CAR C-9, CAR C-10, CAR C-11, CAR C-12 VPA-2: CAR C-5, CAR C-6, CAR C-7, CAR C-8, CAR C-10	VPA-1 ~~CAR C-4~~ ~~CAR C-5~~ ~~CAR C-6~~ ~~CAR C-7~~ ~~CAR C-9~~ ~~CAR C-10~~ ~~CAR C-11~~ ~~CAR C-12~~ VPA-2 ~~CAR C-5~~ ~~CAR C-6~~ ~~CAR C-7~~ ~~CAR C-8~~ ~~CAR C-10~~	OK OK OK OK OK OK OK
E.3. Correctness of calculation ***(VVS, §§ 244-245)***	/MRCPA1/	The verification team has checked the emission reduction calculation and the MR and confirms that:	VPA-1 ~~CAR C-4~~ ~~CAR C-5~~	OK OK OK

Check if the applied formulae and methods for calculating baseline emissions, project emissions and leakage are in accordance with the monitoring plan and / or the approved methodology. *Assess whether the provided calculations are complete and reflect all requirements of the monitoring plan.* *Check especially that no standard or old values have been used for calculation where calculations based on up-to-date data is required.* *When sampling is undertaken, unless differently specified in the methodology applied, the sample mean value shall be used for the ER calculation instead of the lower or upper bounds of the confidence interval.*	/MRCPA 2/ /ERVPA1 / /ERVPA2 /	☐ all applied formulae for calculating baseline emissions, project emissions and leakage are in accordance with the monitoring plan ☐ the provided calculations are complete In this context the following findings have been identified: VPA-1: CAR C-4, CAR C-5, CAR C-6, CAR C-7, CAR C-9, CAR C-10, CAR C-11, CAR C-12 VPA-2: CAR C-5, CAR C-6, CAR C-7, CAR C-8, CAR C-10	~~CAR C-6~~ ~~CAR C-7~~ ~~CAR C-9~~ ~~CAR C-10~~ ~~CAR C-11~~ ~~CAR C-12~~ VPA-2 ~~CAR C-5~~ ~~CAR C-6~~ ~~CAR C-7~~ ~~CAR C-8~~ ~~CAR C-10~~	OK
E.4. Emission reductions table ***(EB 75, Annex 7, E.4)*** *Check if the MR includes a summary table of the emission reductions calculation specifying separately* - *Total baseline emissions* - *Total project emissions:* - *Total leakage* - *Total emission reductions.* *Assess whether the values are correct or need to be revised as a consequence of issues identified above.*	/MRCPA 1/ /MRCPA 2/ /ERVPA1 / /ERVPA2 /	☒ The MR includes a summary table of the emission reductions calculation. ☒ The summary table specified the total baseline, project and leakage emissions as well as the total emission reductions separately. ☐ The values as specified in the ER summary table are correct; no issues have been identified during the verification which require changes in the ER calculation. ☐ During the verification issues with impact on the ER calculation have been identified. Thus subject to the closure of above listed findings the summary needs to be revised. In this context the following additional findings have been identified:	VPA-1 ~~CAR C-4~~ ~~CAR C-5~~ ~~CAR C-6~~ ~~CAR C-7~~ ~~CAR C-9~~ ~~CAR C-10~~ ~~CAR C-11~~ ~~CAR C-12~~ VPA-2	OK OK OK OK

		VPA-1: CAR C-4, CAR C-5, CAR C-6, CAR C-7, CAR C-9, CAR C-10, CAR C-11, CAR C-12 VPA-2: CAR C-5, CAR C-6, CAR C-7, CAR C-8, CAR C-10	~~CAR C-5~~ ~~CAR C-6~~ ~~CAR C-7~~ ~~CAR C-8~~ ~~CAR C-10~~	
E.5. Comparison with ex-ante determined emission reductions ***(EB 75, Annex 7, E.5; E.6)*** *Check if the MR includes a comparison of actual values of the monitoring period with the estimations in the registered VPA-DD.* *Check further whether in case of an increase an appropriate explanation is included in the MR.* *Assess in case of a significant increase whether this is due to technical or organisational changes within or outside the control of the PP and – if this is case – whether the PRC have been considered appropriately.*	/MRCPA1/ /MRCPA2/ /ERVPA1/ /ERVPA2/ VPA1DD /VPA2DD/	The verification team has checked the MR and confirms that: ☒ the MR includes a comparison of actual emission reductions with the estimations of the registered VPA-DD ☒ the increase has been appropriately explained In this context below findings have been identified: VPA-1: CAR C-8 VPA-2: CAR C-9	~~CAR C-8~~ ~~CAR C-9~~	OK

ANNEX 2: STATEMENTS OF COMPETENCE OF INVOLVED PERSONNEL

TÜV NORD Certification

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

Mr. David Lubanga

SCHEME	STATUS	VALID UNTIL
CDM	Senior Assessor (Validation, Verification) Technical Reviewer	2021-10-20
VCS / ISO 14064-2	Senior Assessor Technical Reviewer	2021-10-20

Authorization status for technical areas within sectoral scopes:

CODE	TECHNICAL AREA
1.2	Renewables
3.1	Energy demand
13.2	Manure

251 - Rev. 7, Date: 2018-10-19

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TÜV NORD Certification

Statement of Competence

Mr. Robert Cheong

SCHEME	STATUS	VALID UNTIL
CDM	Senior Assessor (Validation, Verification)	2018-04-01
VCS	Senior Assessor	2018-04-01

CODE	TECHNICAL AREA
1.2	Renewables
3.1	Energy demand
13.1	Solid waste and wastewater
13.2	Manure

128 - Rev. 8, Date: 2018-01-26

TÜV NORD Certification

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

Mr. Kunal Rami

SCHEME	STATUS	VALID UNTIL
CDM	Senior Assessor (Validation, Verification) Technical Reviewer	2020-03-26
VCS / ISO 14064-2	Senior Assessor Technical Reviewer	2020-03-26

Authorization status for technical areas within sectoral scopes:

CODE	TECHNICAL AREA
1.2	Renewables
2.1	Energy distribution
3.1	Energy demand
6.1	Construction
7.1	Transport
13.1	Solid waste and wastewater

224 - Rev. 8, Date: 2018-08-31

224_801-VA060-F20_2018-08-31_rev8.doc 801-VA060-F20 rev3 / 2012-10-25