


Verification report form of GS project

BASIC INFORMATION

Title and GS reference number of the project activity	Indonesia Domestic Biogas Programme of Activities (IDBP VPA-1) GS reference number: program: 1172 VPA-1: 1174
Version number of the verification and certification report	1.2
Completion date of the verification and certification report	30/07/2025
Monitoring period number and duration of this monitoring period	6 th Monitoring; 01/01/2023-31/12/2023
Version number of the monitoring report to which this report applies	5
Crediting period of the project activity corresponding to this monitoring period	01/06/2018 – 31/05/2025
Project participants	Yayasan Rumah Energy (YRE)
Host Party	Indonesia
Applied methodologies and standardized baselines	Technologies and Practices to Displace Decentralized Thermal Energy Consumption version 3.1
Activity Requirements applied	<input checked="" type="checkbox"/> Community Services Activities <input type="checkbox"/> Renewable Energy Activities <input type="checkbox"/> Land Use and Forestry Activities/Risks & Capacities <input type="checkbox"/> N/A
Product Requirements applied	<input checked="" type="checkbox"/> GHG Emissions Reduction & Sequestration <input type="checkbox"/> Renewable Energy Label <input type="checkbox"/> N/A
Estimated amount of ex-ante GHG emission reductions or GHG removals for this monitoring period in the included VPAs covered in this report	55,056 tCO ₂ e
Certified amount of GHG emission reductions or GHG removals for this monitoring period for the included VPAs covered in this report	45,098 tCO ₂ e
Name and GS reference number of the VVB	AENOR CONFIA, S.A.U. (GS S.No.: 3)
Name, position and signature of the approver of the verification and certification report	José Luis Fuentes  Climate Change Manager

SECTION A. Executive summary

AENOR CONFIA S.A.U. (AENOR) has been contracted by PT. Biru Karbon Nusantara (PT. BKN) to undertake this verification of the registered GS programme titled "Indonesia Domestic Biogas Programme of Activities" (VPA-1 GS reference number: 1174). The verification has been performed through a process of document review based on the MR, initially submitted for verification and the subsequent revisions, registered VPA-DD, follow-up interviews, resolution of outstanding issues and issuance of the verification report.

It is important to notice that the Coordinating/Managing Entity (CME) with which the first PoA-DD was approved on 21/10/2013 /43/, was the Dutch development organisation Hivos, which has been changed by PT. Biru Karbon Nusantara (PT. BKN). This has been notified and approved by letter to GS on October 13th, 2023 /44/, where PT. BKN became the new official project representative of the IDBP PoA and Yayasan Rumah Energi (YRE) as the PoA implementer. Upon sale of the biogas system, users will sign a Household Agreement, transferring the rights of the generated emission reductions to PT. BKN. The revenue generated from the subsequent sale of carbon credits will be used to subsidise the investment costs of the biodigesters, making them more affordable. Users will be provided with training on the use of the systems and the proper application of slurry to agricultural land. The unique serial number of each installation are recorded as proved by supporting documentation /6//45/.

The programme's aim is to disseminate domestic biodigesters as a local, sustainable energy source. These biodigesters are fed with a mixture of water and animal manure that is anaerobically digested, and the generated biogas is intended for use as fuel for cooking. The biodigester type implemented is the fixed-dome type, constructed with bricks and stone masonry.

The project is located in Indonesia, in the following provinces:

Province	Latitude	Longitude	Number of biodigesters
Lampung	5° 27' 0.0000" S	105° 16' 0.0120" E	418
West Java*	6° 54' 53.0784" S	107° 36' 35.3160" E	1,448
Central Java	7° 47' 49.4448" S	110° 22' 13.9044" E	1,368
East Java	7° 15' 1.6020" S	112° 46' 7.8420" E	7,638
Bali	8° 24' 34.2648" S	115° 11' 20.1084" E	1,066
Nusa Tenggara Barat	8° 39' 10.5602" S	117° 21' 41.9314" E	4,328
Nusa Tenggara Timur	8° 39' 26.575" S	121° 4' 45.732" E	649
Yogyakarta	7° 47' 49.4448" S	110° 22' 13.9044" E	1,407
South Sulawesi	5° 8' 51.5940" S	119° 25' 57.8352" E	1,930

*Provinces Banten and Sumatera Selatan are included under West Java

The VPA aims to reduce GHG emissions by using biogas systems to replace traditional thermal energy generation methods by making biogas systems affordable and available to households. It meets the small-scale thresholds set forth by the CDM i.e., 15 MW or 45 MW_{th} for the renewable energy component and an emissions cap of 60,000 tCO₂e for the methane avoidance component as shown in the table below:

$Th_{cap} = \frac{E}{t} \quad \text{where} \quad E = \eta * H_b * V_b$		
Where:	Value:	Comments:
t = hours/day usage	2.74	See "Crosstab BUS by Province_18May2016.xls", sheet "raw_data" cell J2683. Fixed for future verifications
η = efficiency of stove	50%	Indonesian Government standard on stove efficiency

H_b = heat of combustion per unit volume of biogas	21.0 MJ/m ³	Derived from IPCC defaults
V_b = volume of biogas	1.80 m ³ /day	Data provided by Hivos /27/
E = Energy available from the biogas system	18.87 MJ/day	Calculated
E_{th} =	5.24 kWh/day	1 MJ = 0.2778 kWh
Th_{cap} =	1.91 kW _{th}	Given a 2.74 hour/day usage
Total capacity	38.738 MW _{th}	Given 20,252 units installed

Scope of the verification

The scope of the verification is to assess all aspects described in the Gold Standard for the global Goals, Principles and Requirements, v1.2. related to all aspects of GHG reduction involved in the programme. The verification is based on the validated project design document Version 10.1, (hereinafter validated or registered VPA-DD) and previous verification report. These documents were also reviewed against the requirements of Gold Standard for the Global Goals v2, and Community Services Activities Requirements, v1.2 /28-29/.

The objectives of this verification are to verify and certify emission reductions reported for the programme for the monitoring period from 01/01/2023 to 31/12/2023 (first and last day included); and to verify that the data reported are complete and transparent.

This report summarizes the findings of the verification of the programme, performed on the basis of GS criteria as well as criteria given to provide for consistent programme operations, monitoring and reporting. UNFCCC criteria refer to the Kyoto Protocol, the CDM rules and modalities as agreed in the Bonn Agreement, the Marrakech Accords and the CDM Executive Board's decisions.

The information in these documents is reviewed against Gold Standard for the Global Goals, Principles and Requirements, v2., the recommendations in the CDM Validation and Verification Standard for programmes of activities version 3.0 Kyoto Protocol requirements and associated interpretations. AENOR has used a risk-based approach in the verification, focusing on the identification of significant risks and reliability of project monitoring and generations of GS-VERs /30/.

The verification is not meant to provide any consulting towards the client. However, stated request for clarifications and/or corrective actions may provide input for improvement of the monitoring.

Verification process

The verification team determines the conformity of the actual programme and its operation with the validated project design document. The audit team has, by means of a desk review and interviews, assessed that all physical features of the proposed programme proposed in the VPA-DD are in place, and that the project participants have operated the programme as per the VPA-DD. Thus, the verification team has concluded that the programme was implemented and operated as per VPA-DD, and that all physical features of the project are in place.

The verification team, based on the interviews and document review, was able to conclude that the programme has been commissioned and implemented as per the VPA-DD. The start date of this monitoring period is 01/01/2023 and considering the end date of the previous monitoring period, the verification team concludes that it is correct.

The verification team has planned and performed the work to obtain the information and explanations that is considered necessary to provide sufficient evidence for it to give reasonable assurance that the amount of calculated GHG emission reductions for this monitoring period were fairly stated.

The monitoring report for this monitoring period is in compliance with the monitoring plan of the registered VPA-DD /2/. The programme was registered by applying the GS methodology Technologies and Practices to Displace Decentralized Thermal Energy Consumption version 3.1

and the verification was carried out in accordance with the applied methodology /33/. It was confirmed that the programme during the current verification is in accordance with the applicability criteria of the methodology.

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

All Corrective Action Requests (CAR) and Clarification Actions (CL) have been checked by the verification team and have been adequately resolved. Also, a Forward Action Request (FAR) has been raised during this monitoring period, to be attended in the future verification.

All the verification findings are documented in Appendix 4.

As a final step of the verification, the verification report has to undergo internal quality control by means of a technical review following the procedures of AENOR. The technical reviewer is a competent person from AENOR CONFIA, independent of the team that carried out the verification of the project activity.

In AENOR's opinion, the GHG emissions reductions of the monitoring period from 01 January 2023 – 31 December 2023, were calculated correctly and amount 45,098 tonnes of CO₂ equivalent.

SECTION B. Verification team, technical reviewer and approver

B.1. Verification team member

No.	Role	Type of resource	Last name	First name	Affiliation (e.g. name of central or other office of VVB or outsourced entity)	Involvement in			
						Desk/document review	On-site inspection	Interviews	Verification findings
1.	Team Leader	IR	Arranz Arbex	Asís	AENOR	Yes	Yes	Yes	Yes
2.	Verifier	IR	Arribas Alonso	Luis Javier	AENOR	Yes	No	No	Yes

B.2. Technical reviewer and approver of the verification and certification report

No.	Role	Type of resource	Last name	First name	Affiliation (e.g. name of central or other office of VVB or outsourced entity)
1.	Technical reviewer	IR	Gonzales Toledo	Richard Daniel	AENOR
2.	Approver	IR	Fuentes Pérez	José Luis	AENOR

SECTION C. Means of verification

C.1. Desk/document review

The verification was performed primarily based on the review of the monitoring report and the supporting documentation. This process included review of data and information presented to verify

their completeness and review of the monitoring plan and monitoring methodology, paying particular attention to the frequency of measurements, the quality of metering equipment including calibration requirements, and the QA/QC procedures, and an evaluation of data management and the QA/QC system in the context of their influence on the generation and reporting of emission reduction.

The following documents were reviewed as part of the verification:

- MR, including excel calculations /3-5/.
- Gold Standard for the Global Goals Safeguarding Principles & Requirements Version 2.1 /37/
- Technologies and Practices to Displace Decentralized Thermal Energy Consumption (TPDDTEC), version 3.1 /33/.
- Decision 3/CMP.1 and relevant decisions and guidelines from the EB
- CDM Validation and Verification Standard for programmes of activities, v03.0 /30/
- Gold Standard for the Global Goals, Principles and Requirements, v2. /28/
- Gold Standard for the Global Goals, Community Services Activities Requirements, v1.2. /29/

The initial version of the monitoring report version 0.1 /3/ submitted by the project participant and additional background documents related to the emission reductions are reviewed as an initial step of the verification process. The subsequent step involved the identification of corrective action requests, clarification requests and one forward action request (CAR, CL and FAR) which are presented in Appendix 4 of this report. In response, Project Participant (PP) has submitted MR version 5 /4/. A complete list of all documents and records reviewed is as attached in Appendix 3 of this report.

C.2. On-site inspection

Duration of on-site inspection: 14/01/2025 to 17/01/2025				
No.	Activity performed on-site	Site location	Date	Team member
1.	<ul style="list-style-type: none"> • On site verification of project implementation through interviews in 2 households selected from the sampling plan • Training records • QA/QC procedures • Controls established to detect and correct any error or omission in monitoring parameters • Testing of monitoring equipment and observation of monitoring practices • Maintenance procedures • Grievance Mechanism 	PROJECT ACTIVITY SITE	14/01/2025	Asís Arranz Arbex
2.	<ul style="list-style-type: none"> • On site verification of project implementation through interviews in 7 households selected from the sampling plan • Training records • QA/QC procedures • Controls established to detect and correct any error or omission in monitoring parameters • Testing of monitoring equipment and observation of monitoring practices • Maintenance procedures • Grievance Mechanism 	PROJECT ACTIVITY SITE	15/01/2025	Asís Arranz Arbex
3.	<ul style="list-style-type: none"> • On site verification of project implementation through interviews in 4 households selected from the sampling plan • Training records • QA/QC procedures • Controls established to detect and correct any error or omission in monitoring parameters • Testing of monitoring equipment and observation of monitoring practices • Calibration of official meters • Maintenance procedures • Grievance Mechanism 	PROJECT ACTIVITY SITE	16/01/2025	Asís Arranz Arbex
4.	<ul style="list-style-type: none"> • On site verification of project implementation through interviews in 4 household selected from the sampling plan • Training records • QA/QC procedures • Controls established to detect and correct any error or omission in monitoring parameters • Testing of monitoring equipment and observation of monitoring practices • Maintenance procedures • Grievance Mechanism 	PROJECT ACTIVITY SITE	17/01/2025	Asís Arranz Arbex

5.	<ul style="list-style-type: none"> • Summary of findings detected during the desk review • Summary of findings detected during the onsite visit • Review of some doubts of the PP and VVB as for drop-off and other biodigester fuel uses accounted in the spreadsheets and the ERs • Review documents if required after findings commented: PDD, MR, spreadsheet and evidence provided 	FINAL MEETING	17/01/2025	Asís Arranz Arbex
----	---	---------------	------------	-------------------

Duration of on-site inspection: 14/01/2025 to 17/01/2025				
No.	Activity performed on-site	Site location	Date	Team member
1.	Interviews of 2 households	Bonjeruk	14/01/2025	Asís Arranz Arbex
2.	Interviews of 7 households	Ubung (4), Sambik Bangkol (1) and Selengen (2)	15/01/2025	Asís Arranz Arbex
3.	Interviews of 4 households	Sesait (2) and Santong (2)	16/01/2025	Asís Arranz Arbex
4.	Interviews of 4 households	Pendua (3) and Narmada (1)	17/01/2025	Asís Arranz Arbex
5.	Final Meeting	Lombok	17/01/2025	Asís Arranz Arbex

C.3. Interviews

No.	Interviewee			Date	Subject	Team member
	Last name	First name	Affiliation			
1.	Batur Romzini	Chabi	Biru Karbon Nusantara	14/01/2025 - 17/01/2025	Verify the correct implementation of the project in the field and in the documentation provided	Asís Arranz Arbex
2.	Nannuba	Hilma	Biru Karbon Nusantara			
3.	Widoningtyas	Danastri	Yayasan Rumah Energu (YRE)	17/01/2025	Verify the correct implementation of the project in line with the monitoring plan	
4.	Bakhtary	Haseeb	ClimateFocus (Consultant)			
5.	Krisna	Wijaya	Yayasan Rumah Energu (YRE)			
6.	Alwan	Wijaya	Local Community Coordinator	14/01/2025 - 17/01/2025	Verify the correct implementation of the project in the field	
7.		Sahrún	Local Farmers Group Representative			

Additionally, the audit team interviewed a sample of the biodigesters' owners regarding the following matters:

- Information received about the program prior to participating in it
- Signature of contract and voluntary participation
- Opinion on the project
- Participation in survey and trainings
- Use of biogas and any problems that might have been encountered
- SDG benefits
- Grievance mechanism

The results of the interviews provided insight on the programme and allowed to verify the information stated on the MR. The local communities are generally satisfied with the project, participate voluntarily, and have a signed contract with the PP. They are aware of the SDG benefits and are able to contact the designated members of the team in case there is an issue.

C.4. Sampling approach

The sampling plan is developed using guidance of the applied GS methodology and the registered VPA-DD which prescribes a 90% confidence interval with a 10% error margin. With the parameters described, based on the characteristics of VPA-1, time acquired for the on-site visit, the number of verifications previously carried out on the program and having considered households from the sampling carried out by YRE and BKN, a sample size of 17 units has been considered sufficient for the VPA. This selection has been accorded between the PP and VVB as 50-sample size chosen for both VPA-1 and VPA-2, being 17 acceptable for VPA-1.

The units were randomly selected using the “random” function in excel for conservativeness. Moreover, an additional 25% of the selected sample was randomly picked by the verification team in order to ensure a significant sample in case any issue might arise making interviews difficult. The verification team has checked on the sampling plan and considered appropriate.

According to the Standard for sampling and surveys for CDM project activities and programme of activities /35-36/, the verification team determined the following sample size:

- AQL of 0.5%
- UQL of 10%
- Producer Risk of 10%
- Consumer Risk of 20%

Therefore, according to the sampling guidelines, 16 surveyed householders are required to be checked by the VVB and the acceptance number is 0, meaning the latter that number of discrepancies between VVB check and PP result must not exceed. Considering that the biodigesters stopped being installed in VPA-1 since 2017, in order to continue the installations of the project through VPA-2, it was considered acceptable between the VVB and the PP to reduce the sampling of visits for VPA-1 with respect to the previous verification, as well as to increase the sampling of visits in households belonging to VPA-2. Nevertheless, it is noticeable that, as an on-site visit was carried out in the previous verification corresponding to the year 2022, the on-site visit for this verification was not carried out of obligation but as a form of verification, in compliance with paragraph 3.1 of the GS Site visit and remote audit requirements and procedures v2 /48/.

Due to the age of the VPA-1, which was implemented in 2009, greater risks for producer and consumer were considered, as previously mentioned. Likewise, the audit team considered it beneficial to conduct oversampling based on a backup list previously selected with the PP, just in case, and if possible, during the visit times. This allowed for the inspection of one more household, making it possible to inspect 17 biodigester systems in total, belonging 2 to Bonjeruk, 4 to Ubung, 1 to Sambik Bangkol, 2 to Selengel, 2 to Sesait, 2 to Santong, 3 to Pendua and 1 Narmada. The selected households were interviewed by the verifying team with the assistance of YRE and PT. BKN officers.

A questionnaire stipulated by AENOR was completed by the owners and those responsible for the homes, with additional questions about the project as appropriate. Additionally, photographs were taken of all biodigester systems, including their serial numbers, houses, livestock, and, in some cases, family members /26/.

Among the questions raised during the visit in January 2025, the following were addressed:

Usage & Adoption

1. Do you use firewood, charcoal or other type of fuel for cooking? How often? How much quantity is used? How much difference compared to before the installation of the biodigester?

2. How many head of cattle do you have for the biodigester use? What type of cattle?
3. When was the installation? What is the size of the biodigester?

Efficiency & Emissions Reduction

4. Have you noticed a reduction in fuel consumption (firewood/charcoal) since using the biodigester system?
5. How much time does cooking take now compared to before the installation?
6. Have you observed less smoke inside your home since the installation of the biodigester?
7. Has the indoor air quality improved for your family? (less coughing, eye irritation, etc.)

Maintenance & Durability

8. Have you had to repair any part of the biodigester system? If so, what issues needed fixing? When was the incident?
9. How do you contact the program to solve any problem?
10. Did you receive training on how to use and maintain the biodigester system properly?

Socioeconomic & Environmental Benefits

11. Have you saved money on fuel purchases since the biodigester installation?
12. Have you experienced other benefits, such as less time collecting firewood or improved safety while cooking?

User Satisfaction & Feedback

13. What do you like most about the program?
14. What aspects of the biodigester system could be improved (design, functionality)?
15. Did the CME communicate you the grievance mechanism?
16. Do you have any comment about the program, in terms of advantages and disadvantages?

The list of the interviews carried out during the on-site visit is represented below:

IDBP PLANT CODE	PLANT SIZE (m3)	NAME OF OWNER	VILLAGE	SUBDISTRICT	DISTRICT	PROVINCE
SDP0070	4	Hukum	Bonjeruk	Jonggat	Lombok Tengah	Nusa Tenggara Barat
SDP0076	4	Wiyarse	Bonjeruk	Jonggat	Lombok Tengah	Nusa Tenggara Barat
SDP0067	4	Abbas	Ubung	Jonggat	Lombok Tengah	Nusa Tenggara Barat
PRP0017	4	Nayak	Ubung	Jonggat	Lombok Tengah	Nusa Tenggara Barat
PRP0161	4	Satim	Ubung	Jonggat	Lombok Tengah	Nusa Tenggara Barat
PRP0021	4	M. Ilham	Ubung	Jonggat	Lombok Tengah	Nusa Tenggara Barat
SDP0278	4	Mahmud	Sambik Bangkol	Gangga	Lombok Utara	Nusa Tenggara Barat
YSP1447	4	Ahmad	Selengel	Kayangan	Lombok Utara	Nusa Tenggara Barat
YSP1430	4	Ramadan	Selengel	Kayangan	Lombok Utara	Nusa Tenggara Barat
YSP1104	4	Renye	Sesait	Kayangan	Lombok Utara	Nusa Tenggara Barat
YSP0959	4	Setamah	Sesait	Kayangan	Lombok Utara	Nusa Tenggara Barat
YSP0427	4	Ripai	Santong	Kayangan	Lombok Utara	Nusa Tenggara Barat
YSP0268	4	Nasrin Hariadi	Santong	Kayangan	Lombok Utara	Nusa Tenggara Barat
YSP0083	4	Anudin	Pendua	Kayangan	Lombok Utara	Nusa Tenggara Barat
YSP0096	4	Rasidip	Pendua	Kayangan	Lombok Utara	Nusa Tenggara Barat
YSP0348	4	Chayadi	Penuda Sentul	Kayangan	Lombok Utara	Nusa Tenggara Barat

IDBP PLANT CODE	PLANT SIZE (m3)	NAME OF OWNER	VILLAGE	SUBDISTRICT	DISTRICT	PROVINCE
SDP0392	6	HJ. Umminingsih	Narmada	Narmada	Lombok Barat	Nusa Tenggara Barat

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

All documentation provided by the PP was assessed against the applicable version of the relevant GS guidance document. Several clarification requests (CL), a corrective action request (CAR) and a forward action request (FAR) were raised and submitted to the PP, which addressed them either by providing to the audit team with the requested information or by making the appropriate corrections. Updated versions of the documentation were submitted by the PP and the audit team reassessed them against the guidance documentation. This process was repeated iteratively until all CL and CAR were fully closed. Specifically, 4 CLs, 1 CAR and 1 FAR were raised.

Areas of verification findings	No. of CL	No. of CAR	No. of FAR
Compliance of the monitoring report with the monitoring report form	-	-	-
Compliance of the project implementation and operation with the registered PDD	-	-	-
Post-registration changes	-	-	-
Compliance of the registered monitoring plan with the methodologies including applicable tools and standardized baselines	-	-	-
Compliance of monitoring activities with the registered monitoring plan	CL 2, 3 and 4	-	FAR 1
Compliance with the calibration frequency requirements for measuring instruments	-	-	-
Assessment of data and calculation of emission reductions or net removals	-	-	-
Assessment of reported sustainable development co-benefits	-	-	-
Local stakeholder consultation	-	-	-
Others	CL 1	CAR 1	-
Total	4	1	1

All findings issued by the AENOR audit team during the validation process have been closed and can be found in the Appendix 4 of this report.

SECTION D. Verification findings

D.1. Compliance of the monitoring report with the monitoring report form

Means of verification	The verification team has determined whether the monitoring report was completed using the valid version of the applicable monitoring report form. The verification team has checked whether all the sections of the monitoring report follow the guidelines provided in the template itself.
Findings	No finding was raised regarding this issue.
Conclusion	PP has used the valid version of the MR template version 1.1 published by GS which is current and active. The monitoring report has been prepared as per the instructions provided in the GS requirements. The verification team has concluded that the monitoring report was completed using the valid version of the applicable monitoring report form and is followed the guidelines given in the template /32/.

D.2. Remaining forward action requests from validation and/or previous verifications

The audit team has reviewed the previous verification report and validation report observed that there were no FARs pending to close from the previous verification and the validation report of the renewal of the crediting period.

D.3. Compliance of the project implementation and operation with the registered project design document

Means of verification	<p>The compliance of the VPA implementation with the registered project design document was verified through the interviews and desk-review of documents provided by the project participants. All revised documents are listed in Appendix 3. As explained in Section C.4 above, the audit team interviewed 17 HHs and checked the main parts of the program activity on each benefited house: type and heads of cattle, method of manure warehouse, the biodigester and the kitchen; how the family uses the stoves and if they use different methods than those reported in the surveys. The main questions of the surveys done by the VVB were the following: Serie number of the biodigester, name and surname of the family member interviewed, community, date of installation, size of the technology (m³), type and heads of cattle, satisfaction of the family with the biodigester and the activity program, additional comments of the interviewers and observations by the auditor. The audit team reviewed that the main technical features of the programme and other equipment are operational as per specifications mentioned in the VPA-DD.</p> <p>The audit team verified the correct operation of the VPA by reviewing different technical documentation, surveys, procedures and registries. Project participant has provided all necessary information and documentation to demonstrate compliance of the implemented registered VPA and monitored GHG emission with all applicable requirements to the methodology and applicable GS4GG rules.</p>
Findings	No finding was raised regarding this issue.
Conclusion	<p>AENOR confirms that:</p> <ul style="list-style-type: none">• The implementation status and equipment installation of the programme are consistent with the registered VPA-DD.• The actual operation of the Programme is as per the registered VPA-DD.• Information (data and variables) provided in the monitoring report is in accordance with that stated in the registered VPA-DD.• The actual GHG emission reductions achieved by the programme in the current monitoring period that have been reported in the monitoring report are lower than the estimated for the same monitoring period in the VPA-DD.

D.4. Post-registration changes

D.4.1. Temporary deviations from the registered monitoring plan, applied methodologies, standardized baselines or other methodological regulatory documents

Not applicable.

D.4.2. Corrections

Not applicable.

D.4.3. Changes to the start date of the crediting period

Not applicable.

D.4.4. Permanent changes from registered monitoring plan, or permanent deviation of monitoring from the applied methodologies, standardized baselines or other methodological regulatory documents

Not applicable.

D.4.5. Changes to the project design

Not applicable.

D.5. Compliance of the registered monitoring plan with applied methodologies, applied standardized baselines, and other applied methodological regulatory documents

<p>Means of verification</p>	<p>The compliance of monitoring plan with the monitoring methodology was verified by reviewing whether the VPA was in accordance with the applied methodology and if any other monitoring aspect of the VPA that is not specified in the methodology was established.</p> <p>During the desk review, the audit team was able to review different records and assess whether the monitoring methodology has been adequately considered and documented.</p> <p>The audit team verified the monitoring of reductions in GHG emissions to result from the proposed VPA and whether it was implemented in accordance with the registered VPA-DD and the project participant is recording the data and parameters following the monitoring methodology applied.</p> <p>Regarding this issue, the verification team reviewed:</p> <ul style="list-style-type: none"> • The monitoring of reductions in GHG emissions to result from the proposed VPA was implemented in accordance with the Monitoring Plan. • The monitoring plan and the applied methodology had been properly implemented and followed by the project participant. • Trainings were performed in order to ensure the correct monitoring of parameters /13-16//19-24/. • All parameters stated in the monitoring plan, the applied methodology and other requirements have been sufficiently monitored and updated. • The responsibilities and authorities for monitoring and reporting were in accordance with the responsibilities and authorities stated in the monitoring plan. <p>The audit team has verified that the monitoring of reductions in GHG emissions to result from the proposed GS programme is implemented in accordance with the monitoring plan.</p>
<p>Findings</p>	<p>No finding was raised regarding this issue.</p>
<p>Conclusion</p>	<p>The verification team reviewed whether the monitoring plan was in accordance with the applied methodology and any other monitoring aspect of the programme that is not specified in the methodology was established /1-2/.</p> <p>The verification team confirms that the monitoring plan is in accordance with the applied methodology Technologies and Practices to Displace Decentralized Thermal Energy Consumption version 3.1 based on the following reasons /33/:</p> <ul style="list-style-type: none"> • During the desk review monitoring parameters included in the applied methodology were compared with the ones included in the Monitoring plan of the registered VPA-DD, and they were found consistent. • The monitoring plan perfectly fulfils the criteria stated in the monitoring methodology. • No other relevant aspects for monitoring not included in the methodology were identified. <p>Therefore, AENOR confirms that the monitoring plan is in compliance with the approved methodology applied by the GS programme and applicable tool.</p>

D.6. Compliance of monitoring activities with the registered monitoring plan

D.6.1. Data and parameters fixed ex ante or at renewal of crediting period

Means of verification	Data and parameters fixed ex ante were verified through desk-review of final version of monitoring report, registered VPA-DD and methodology applied. The fixed parameters used for calculating the emission reduction have been indicated and verified as follows:	
	Data/parameter	f_{NRB,y}
	Unit	%
	Description	Fraction of biomass used in the absence of the project activity in year y that can be established as non-renewable biomass using nationally approved methods
	Source of data	Reports, surveys, and government data
	Value(s) applied	58.36
	Choice of data or Measurement methods and procedures	Calculated as per guidance of the applied methodology: $f_{NRB,y} = \frac{NRB}{NRB+DRB}$
	Purpose of data	Calculation of baseline emissions
	Additional comment	Since the MR of VPA1 covers the second crediting period of VPA-1, the PP refers to the fNRB of 58.36% as per that approved PDD.
	Data/parameter	NRB
	Unit	m ³
	Description	Non-renewable woody biomass
	Source of data	FAO (2010) Global Forest Resources Assessment 2010 Country Report Indonesia; FAO (2015) Global Forest Assessment 2015; calculation /40/
	Value(s) applied	50,421,516
	Choice of data or Measurement methods and procedures	NRB can be calculated by subtracting the DRB of 35,974,483 m ³ from 86,396,000 m ³ . By is the amount of firewood removed from forests which amounts to 86,396,000 m ³ (FAO, 2010).
	Purpose of data	Calculation of baseline emissions
	Additional comment	-
	Data/parameter	DRB
	Unit	m ³
	Description	Demonstrably renewable woody biomass
	Source of data	FAO (2010) Global Forest Resources Assessment 2010 Country Report Indonesia; FAO (2015) Global Forest Assessment 2015; calculation
	Value(s) applied	35,974,483
	Choice of data or Measurement methods and procedures	The annual sustainable yield from the plantations is determined to be 42,041,000 m ³ , which is more conservative than the 35,378,000 m ³ estimated by ITTO (2009). The more conservative number 42,041,000 m ³ is multiplied by the fraction of wood fuel removals from total wood removals (85.57%) reported by FAO, yielding yields the demonstrably renewable biomass (DRB) of 35,974,483 m ³ /41/.
	Purpose of data	Calculation of baseline emissions
	Additional comment	-

Data / Parameter	BB_{b1, bio}
Unit	Tonnes/year
Description	Amount of woody biomass used in the baseline scenario 1: households
Source of data	Baseline Survey, December 2017; Baseline December KPT 2017 /46/
Value(s) applied	1.435
Choice of data or Measurement methods and procedures	Baseline KPT was executed in December 2017 targeting 55 households. These households reported an average daily use of 3.93 kg of biomass, equivalent to 1.435 tonnes of biomass per year.
Purpose of data	Calculation of baseline emissions
Additional comment	-

Data / Parameter	BB_{b1, fuel}
Unit	Tonnes/year
Description	Amount of fossil fuels used in the baseline scenario 1: households
Source of data	Baseline Survey, December 2017; Baseline December KPT 2017 /46/
Value(s) applied	LPG: 0.088
Choice of data or Measurement methods and procedures	Baseline KPT was executed in the period from in of December 2017 targeting 55 households. These households reported an average daily use of 0.24 kg of LPG, equivalent to 0.088 tonnes of LPG per year.
Purpose of data	Calculation of baseline emissions
Additional comment	-

Data/parameter	EF_{b1, bio}
Unit	tCO ₂ /TJ
Description	Emission factor of the woody biomass used in the baseline scenario
Source of data	2006 IPCC Guidelines for National Greenhouse Gas Inventories /34/
Value(s) applied	112
Choice of data or Measurement methods and procedures	As per requirement of the methodology and Table 2.3, Chapter 2, Volume 2 of the 2006 IPCC Guidelines. The IPCC is a standard, credible source of emissions factors.
Purpose of data	Calculation of baseline emissions
Additional comment	IPCC (2006); May be updated according to any future changes by the IPCC. CO ₂ and non-CO ₂ emissions factors for charcoal may be estimated from project specific monitoring or alternatively by researching a conservative wood to charcoal production ratio (from IPCC, credible published literature, project-relevant measurement reports, or project-specific monitoring) and multiplying this value by the pertinent EF for wood.

Data/parameter	EF_{p1, bio}
Unit	tCO ₂ /TJ
Description	Emission factor of the woody biomass used in the project scenario
Source of data	2006 IPCC Guidelines for National Greenhouse Gas Inventories

Value(s) applied	112
Choice of data or Measurement methods and procedures	As per requirement of the methodology and Table 2.3, Chapter 2, Volume 2 of the 2006 IPCC Guidelines. The IPCC is a standard, credible source of emissions factors.
Purpose of data	Calculation of project emissions
Additional comment	IPCC (2006); May be updated according to any future changes by the IPCC.

Data/parameter	NCV_{bio}
Unit	TJ/tonne
Description	Net calorific value of the non-renewable biomass used in the baseline scenario
Source of data	2006 IPCC Guidelines for National Greenhouse Gas Inventories
Value(s) applied	0.015
Choice of data or Measurement methods and procedures	As per requirement of the methodology and Table 2.3, Chapter 2, Volume 2 of the 2006 IPCC Guidelines. The IPCC is a standard, credible source of emissions factors.
Purpose of data	Calculation of baseline emissions
Additional comment	IPCC (2006); May be updated according to any future changes by the IPCC

Data/parameter	EF_{b1, fuel}
Unit	tCO ₂ /TJ
Description	Emission factor of fossil fuels used in the baseline scenario
Source of data	2006 IPCC Guidelines for National Greenhouse Gas Inventories
Value(s) applied	Kerosene = 71.9 LPG = 63.1
Choice of data or Measurement methods and procedures	As per requirement of the methodology and Table 2.3, Chapter 2, Volume 2 of the 2006 IPCC Guidelines. The IPCC is a standard, credible source of emissions factors.
Purpose of data	Calculation of baseline emissions
Additional comment	IPCC (2006); May be updated according to any future changes by the IPCC

Data/parameter	EF_{p1, fuel}
Unit	tCO ₂ /TJ
Description	Emission factor of fossil fuels used in the project scenario
Source of data	2006 IPCC Guidelines for National Greenhouse Gas Inventories
Value(s) applied	Kerosene = 71.9 LPG = 63.1
Choice of data or Measurement methods and procedures	As per requirement of the methodology and Table 2.3, Chapter 2, Volume 2 of the 2006 IPCC Guidelines. The IPCC is a standard, credible source of emissions factors.
Purpose of data	Calculation of baseline emissions
Additional comment	IPCC (2006); May be updated according to any future changes by the IPCC

Data/parameter	NCV_{fuel}
Unit	TJ/tonne
Description	Net calorific value of fossil fuels used in the baseline scenario
Source of data	2006 IPCC Guidelines for National Greenhouse Gas Inventories
Value(s) applied	Kerosene = 0.0438 LPG = 0.0473
Choice of data or Measurement methods and procedures	As per requirement of the methodology and Table 2.3, Chapter 2, Volume 2 of the 2006 IPCC Guidelines. The IPCC is a standard, credible source of emissions factors.
Purpose of data	Calculation of baseline emissions
Additional comment	IPCC (2006); May be updated according to any future changes by the IPCC

Data/parameter	η_{biogas stove}
Unit	%
Description	Combustion efficiency of the biogas stove introduced by the VPA
Source of data	LIPI Stove Report, 2010; Indonesian Government standard on stove efficiency /38//39/
Value(s) applied	50
Choice of data or Measurement methods and procedures	A comprehensive combustion efficiency test of the biogas stove introduced by the VPA was conducted in 2010 by LIPI, a governmental testing institute. The resulting efficiency of the biogas stoves was 52%. The Indonesian Government standard on stove efficiency indicates an efficiency of 50% is prevalent. The latter has been used to be conservative.
Purpose of data	Calculation of baseline emissions
Additional comment	-

Data/parameter	EF_{awms,T}
Unit	kg CH ₄
Description	Emission factor for the defined livestock population category T by average temperature (27.1°C)
Source of data	2006 IPCC Guidelines for National Greenhouse Gas Inventories; Indonesian Meteorological Climatological and Geophysical Agency
Value(s) applied	Dairy cows = 31 Other cattle = 1 Buffalo = 2 Market swine = 7 Goats = 0.22 Sheep = 0.20 Poultry = 0.02
Choice of data or Measurement methods and procedures	As per requirement of the methodology and sourced from Tables 10.A-4 through A-9., Chapter 10, Volume 4 of the 2006 IPCC Guidelines The IPCC is a standard, credible source of emissions factors.
Purpose of data	Calculation of baseline emissions
Additional comment	IPCC (2006); May be updated according to any future changes by the IPCC

	Verification of data generation, aggregation and recording in this case is not applicable since they are fixed parameters from the registered VPA-DD. The values for the fixed parameters in the registered VPA-DD have been correctly used in calculation and reporting of emissions reductions for the monitoring period verified.
Findings	No finding was raised regarding this issue.
Conclusion	Data parameters fixed at validation, used for calculating the emission reduction, are in accordance with registered VPA-DD, methodology and other requirements. All data sources and assumptions are appropriate, and calculations are correct as applicable to the proposed programme.

D.6.2. Data and parameters monitored

Means of verification	The audit team carried out a review of information flows for generating, aggregating and reporting the monitoring parameters to assess a completeness of monitoring in line with the monitoring plan and the applied methodology, including among others: <ul style="list-style-type: none"> • The measurement/determination method used. • Relevant monitoring equipment, their features and the control and calibration procedures. • Significant inaccuracies occurred in case of measured or estimated values of some parameters. • Measuring, reading and/or recording frequency. • QA/QC procedures applied to prevent or identify and correct any errors or omissions in the reported monitoring parameters. <p>Data and monitored parameters were verified through the field visit, interviews and desk-review. The monitoring system and all applied procedures are in compliance with the monitoring plan and the applied methodology based on the information included in the final monitoring report. The list of all monitored parameters and the means of verification used are detailed as follows:</p>	
	Data/parameter:	U_{p1,y}
	Unit	Fraction
	Description	Cumulative usage rate for technologies in project scenario p1 in year y, based on cumulative adoption rate and drop off rate (fraction)
	Measured/calculated/default	Measured
	Source of data	Collected through the annual Biogas User Survey; Biogas User Survey 2023 results have been used for the purpose of the ex-post calculation – Drop_off_BUS2023_rev.xlsx Sheet Drop-off_2023 Cell E15 - E21 /12/.

	Value(s) of monitored parameter	0.899 With the following usage rate for each age group: <table border="1" style="background-color: #92d050; width: 100%;"> <thead> <tr> <th>Age group</th> <th>Usage rate</th> </tr> </thead> <tbody> <tr> <td>Age group 14</td> <td>0.921</td> </tr> <tr> <td>Age group 13</td> <td>0.881</td> </tr> <tr> <td>Age group 12</td> <td>0.952</td> </tr> <tr> <td>Age group 11</td> <td>0.914</td> </tr> <tr> <td>Age group 10</td> <td>0.909</td> </tr> <tr> <td>Age group 9</td> <td>0.914</td> </tr> <tr> <td>Age group 8</td> <td>0.864</td> </tr> </tbody> </table>	Age group	Usage rate	Age group 14	0.921	Age group 13	0.881	Age group 12	0.952	Age group 11	0.914	Age group 10	0.909	Age group 9	0.914	Age group 8	0.864
	Age group	Usage rate																
	Age group 14	0.921																
	Age group 13	0.881																
	Age group 12	0.952																
	Age group 11	0.914																
	Age group 10	0.909																
	Age group 9	0.914																
	Age group 8	0.864																
	Monitoring equipment	NA																
Measuring/reading/recording frequency:	Annual																	
Calculation method (if applicable):	A single usage parameter is weighted to be representative of the quantity of project technologies of each age being credited in a given project scenario																	
QA/QC procedures:	The usage rate of thermal applications will be monitored annually using survey methods to satisfy a 90/10 precision/confidence, following the 'Standard for Sampling and Surveys for CDM Project Activities and Programme of Activities' (EB 69, Annex 4) /35-36/.																	
Purpose of data:	Emission reduction calculation																	
Additional comments:																		
<p>Through the source of data represented for $U_{p1,y}$, the cumulative usage rate for technologies by age group in the project scenario are observable for the corresponding crediting periods, based on cumulative adoption rate and drop off rate (fraction). The VVB team has verified the data through the traceability of the column "% in operation", cells E15-E21, where the "Non-technical drop-off rate" of the total samples by year of the crediting period have been taken into account. By applying the % in operation to the units built for each period, considering the total 20,252 biodigesters installed in the VPA, it is obtainable the proportion of drop-off rate over the units installed. The sum of the latter, gives the weighted average rate of operation VPA-1 for $U_{p1,y}$ by 0.899.</p>																		
Data/parameter:	$N_{p1,y}$																	
Unit	Number																	
Description	Cumulative number of project technology-days included in the project database for project scenario p1 against baseline scenario b1 in year y																	
Measured/calculated/default	Measured																	
Source of data	IDBP database and Biogas User Survey; Biogas User Survey 2023 results have been used for the purpose of the ex-post calculation /10/.																	
Value(s) of monitored parameter	Reported as a result of $(N_{op1,y} * U_{p1,y} * (Op_{1,y} / 365))$, which equals $(20,252 * 0,899 * 364.9052 / 365) = 18,210$ when rounded up																	
Monitoring equipment	NA																	
Measuring/reading/recording frequency:	Continuous																	

Calculation method (if applicable):	$N_{p1,y}$ is calculated from (a) the number of installed system (parameter $No_{p1,y}$); and (b) the average operational days of the system ($O_{p1,y}$). The equation is therefore ($N_{p,y} = No_{p,y} * U_{p1,y} * (O_{p,y} / 365)$) The average operational days will be confirmed upon verification. Households are required to notify provincial office staff in a situation when a biodigester stops working. This information is recorded in the IDBP database, allowing the identification per included biodigester the amount of operational days per year. In a scenario where the biodigester stops operating, the number of non-operational days is recorded in the database.
QA/QC procedures:	As per procedures of the IDBP database
Purpose of data:	Emission reduction calculation
Additional comments:	-

Value of the equation parameters of $N_{p1,y}$ shown in the source of data of their corresponding following tables below.

Data/parameter:	$No_{p1,y}$
Unit	Number
Description	Cumulative number of project technologies included in the project database for project scenario p in year y
Measured/calculated/default	Measured
Source of data	2024_IDBP_Database_VPA1.xls /10/
Value(s) of monitored parameter	20,252
Monitoring equipment	NA
Measuring/reading/recording frequency:	Continuous
Calculation method (if applicable):	The actual number of biodigesters.
QA/QC procedures:	As per procedures of the IDBP database
Purpose of data:	Emission reduction calculation
Additional comments:	-

Data/parameter:	$O_{p1,y}$
Unit	Number
Description	The average technology-days during which the biodigesters are operational for project scenario p1 against baseline scenario b1 in year y
Measured/calculated/default	Measured
Source of data	ER Calculation with data from IDBP Database – “20240930 ER Calculation VPA1 MP6 CP2” sheet “GS VER 2023” cell E89 /5//10/
Value(s) of monitored parameter	364.9052
Monitoring equipment	NA
Measuring/reading/recording frequency:	Continuous
Calculation method (if applicable):	The actual cumulative number of biodigester non-operational days will be confirmed upon verification. The equation to calculate this is ($O_{p,y} = 365 - \text{non-operational days}$). Non-operational days are based on the number of observations of technical drop-offs, which need to be repaired within a 15 day period. For number of incidences reported during this MP, see: 20230215_IDBP_Database_VPA1” sheet “PLANT MAINTENANCE” cell I42915

QA/QC procedures:	As per procedures of the IDBP database
Purpose of data:	Emission reduction calculation
Additional comments:	-

For parameter $N_{p1,y}$, the average technology-days ($O_{p1,y}$) during which the biodigesters are operational for project scenario of the corresponding monitoring period against the baseline scenario, has been assessed by the VVB through the following evidence provided by the PD:

- “20240930 ER Calculation VPA1 MP6 CP2”, tab “GS VER 2023”, cell E89: subtraction of the non-operational days (multiplication of 128 number of observations of technical drop-offs and 15 days period where units need to be repaired) to the total days of a year (365), in based on total VPA1 units installed to date (20,252).

- “2024_IDBP_Database_VPA1”, tab “PLANT MAINTENANCE”, cell I43056: where the number of incidences reported during the corresponding monitoring period is represented by 128. The PP has considered from all the data of the benefited HHs, the period 2009-2016 the biodigester installations and the year 2023 for the maintained units.

Data/parameter:	LE_{p1,y}
Unit	tCO ₂ e/year
Description	Leakage in project scenario p during year y
Measured/calculated/default	Measured
Source of data	Collected through the annual Biogas User Survey. See “20240930 ER Calculation VPA1 MP6 CP2.xls” sheet GS VER2023 cell E82 /5/
Value(s) of monitored parameter	0.067
Monitoring equipment	NA
Measuring/reading/recording frequency:	Every two years
Calculation method (if applicable):	
QA/QC procedures:	The leakage is monitored once every two years using survey methods to satisfy the requirements put forth by the methodology Technologies and Practices to Displace Decentralized Thermal Energy Consumption, Version 3.1.
Purpose of data:	Calculation of leakage emissions
Additional comments:	

While there is no leakage emissions from methane avoidance under the VPA per household, the value applied of the total CO₂ leakage emissions from fuel substitution under the VPA per household ($LE_{p1,CO2,y}$) comes from a leakage assessment done by the PD in 2023 /11/, related to the fuel usage for VPA-1.

While considering the following project emissions parameters: f_{NRB} , $BB_{p1,bio}$, NCV_{bio} , $EF_{p1,bio}$ and $PE_{CO2,y}$ for biomass as fuel substitution on one hand, and $BB_{p1,fuel}$, NCV_{fuel} , $EF_{p1,fuel}$ and $PE_{CO2,y}$ for LPG as fuel substitution on the second hand (from estimates on 20240930 ER Calculation VPA1 MP6 CP2 spreadsheet, tab GS VER 2023), the PD has provided the corresponding assessment as evidence “20240915 Leakage Output 2023” Excel file, where tab “fuel_use” estimates the next parameters for the CO₂ leakages /5//11/:

- “N” and “Mean” for the volume of LPG used, by 8 and 5.8 respectively.
- “N” and “Mean” for firewood used, by 4 and 8.5 respectively.

Data/parameter:	N_{T,h}
Unit	Number
Description	Number of animals of livestock category T in premise h
Measured/calculated/default	Measured
Source of data	BUS 2023 – “BUS_2023_Tabulation_15072024.xlsx” sheet “Tabulasi” cells AD3860 and AG3953 /6/
Value(s) of monitored parameter	Dairy cows = 4.62 ¹ Beef cows = 0.79
Monitoring equipment	NA
Measuring/reading/recording frequency:	Annual
Calculation method (if applicable):	Analysis of animal ownership from the BUS 2023 shows that cows and buffaloes are the dominant type of animal owned by majority of biodigesters users (61%), followed by beef cows (28.2%). Given the marginal emission impact of the latter two categories and for conservativeness, only methane emissions from dairy cows and beef cows will be considered in this emissions reduction calculation. Methane emissions from tertiary and any following animal types are not included for conservativeness. This means that the total average number of animals kept amounted to 4.62 dairy cows and 0.79 beef cows per household.
QA/QC procedures:	-
Purpose of data:	Calculation of baseline emissions
Additional comments:	-

The monitored values applied of 4.62 and 0.79 come from the average calculated for share of cows and beef per household used for emission reductions and year of use by 5.66%, taking into account the responses on question 73.a “Number of dairy cows owned last year” and “Number of beef cattle owned last year”: 171 households using dairy cow over, and 79 households with beef cow, the former over 217 households using digester of the total respondents in the survey, and the latter over 155 households.

Data/parameter:	PL
Unit	%
Description	Physical leakage of the biodigester
Measured/calculated/default	Default
Source of data	IPCC /34/
Value(s) of monitored parameter	Estimated using a 10% default rate of total methane production
Monitoring equipment	NA
Measuring/reading/recording frequency:	Annual
Calculation method (if applicable):	As per Annex 6 of the applied methodology
QA/QC procedures:	-
Purpose of data:	Calculation of project emissions
Additional comments:	-

¹ According to the BUS 2023, for 61% of household cows or buffaloes were the primary animals followed by 28% of beef cows. Some households reported pigs and other animals such as goat and poultry, but their figures are immaterial and have been excluded from the ex-ante calculation presented in this PDD for conservativeness

Confirmed value applied according to the IPCC /34/: Volume 4, Chapter 10, Table 10.17.

Data/parameter:	BB_{p1,bio}
Unit	Tonnes
Description	Quantity of biomass consumed in project scenario p during year y, in tonnes
Measured/calculated/default	Measured
Source of data	KPT Survey, December 2023 - April 2024 – “20240705 KPT December 2023_YRE1.xls” sheet 90-30 test cell W99 /9/
Value(s) of monitored parameter	0.252
Monitoring equipment	Weight scale
Measuring/reading/recording frequency:	Updated every two years through a Project KPT
Calculation method (if applicable):	Project KPT was executed between 29 December 2023 and 2 April 2024 targeting 89 households. These households reported an average daily use of 0.69 kg of wood, equivalent to 0.252 tonnes of wood per year.
QA/QC procedures:	Shall be in line with Section 7 of the applied methodology
Purpose of data:	Calculation of project emissions
Additional comments:	-

BB_{p1,bio} calculated from the average estimated on the 89 households of the survey that resulted on a generation from average daily use of 0.69kg of firewood in biogas user households per day, which equals 251.62 kg per year and 0.252 tonnes per year. Results of this survey are observable on “20240705 KPT December 2023_YRE1.xls”, sheet “90-30 test”.

Data/parameter:	BB_{p1,fuel}
Unit	Tonnes
Description	Quantity of fossil fuel consumed in project scenario 1 during year y, in tonnes
Measured/calculated/default	Measured
Source of data	KPT Survey, December 2023 - April 2024 – “20240705 KPT December 2023_YRE1.xls” sheet 90-30 test cells AC99 and Z99 /9/
Value(s) of monitored parameter	LPG: 0.143 Kerosene: 0.068
Monitoring equipment	Weight scale
Measuring/reading/recording frequency:	Updated every two years through a Project KPT
Calculation method (if applicable):	Project KPT was executed between 29 December 2023 and 2 April 2024 targeting 89 households. These households reported an average daily use of 143.04 kg of LPG, equivalent to 0.143 tonnes of LPG per year, and 67.98 kg of kerosene, equivalent to 0.068 tonnes per year.
QA/QC procedures:	Shall be in line with Section 7 of the applied methodology
Purpose of data:	Calculation of project emissions
Additional comments:	-

BB_{p1,fuel} calculated from the average estimated on the 89 households of the survey that resulted on a generation average daily use of 0.39kg of LPG in biogas user households per day, which equals 143.04kg per year and 0.143 tonnes per year, and an average daily use of 0.19kg of kerosene, which equals 67.98kg per year and 0.068 tonnes per year”.

Data/parameter:	MS_{P,S,K}
Unit	%
Description	Fraction of livestock category T's manure not treated in bio-digester, in climate region k
Measured/calculated/default	Measured
Source of data	"BUS_2023_Tabulation_15072024.xlsx" sheet "Tabulasi" cell AI5064 /6/
Value(s) of monitored parameter	17.0
Monitoring equipment	NA
Measuring/reading/recording frequency:	Annual
Calculation method (if applicable):	
QA/QC procedures:	-
Purpose of data:	Calculation of project emissions
Additional comments:	-

The value applied for the fraction of livestock category T's manure not treated in bio-digester (MS_{P,S,K}), comes from the results estimated from the survey represented in BUS tabulation file, sheet Tabulasi, question 90: percentage of "Cow manure put into the digester (%)" over the corresponding years of use of the VPA-1. The result of the parameter equals to the remaining percentage average calculated from the total result of each year (from Y8 to Y14): 100% - 83.0% = 17.0%.

Data/parameter:	MS_{T,S,k}
Unit	%
Description	Fraction of livestock category T's manure fed into the bio-digester, S in climate region k
Measured/calculated/default	Measured
Source of data	"BUS_2023_Tabulation_15072024.xlsx" sheet "Tabulasi" cell AI5063 /6/
Value(s) of monitored parameter	83
Monitoring equipment	NA
Measuring/reading/recording frequency:	Annual
Calculation method (if applicable):	-
QA/QC procedures:	-
Purpose of data:	Calculation of project emissions
Additional comments:	Applicable to VPAs applying Tier 2 only

Conversely, the value of the fraction of livestock category T's manure fed into the bio-digester corresponds to the calculation described above by 83%. This estimate is generated from the average percentage of total result each year in VPA-1.

Data/parameter:	GWP_{CH4}
Unit	-
Description	Global Warming Potential of methane
Measured/calculated/default	Default

Source of data	IPCC AR5; Updated according to changes by the IPCC /42/
Value(s) of monitored parameter	28
Monitoring equipment	NA
Measuring/reading/recording frequency:	Annual
Calculation method (if applicable):	
QA/QC procedures:	-
Purpose of data:	Emission reduction calculation
Additional comments:	-

Confirmed value applied according to the IPCC AR5 /42/: Climate Change 2014 Synthesis Report.

Data/parameter:	Bio
Unit	%
Description	Use of bio-slurry
Measured/calculated/default	Measured
Source of data	"BUS_2023_Tabulation_15072024.xlsx" sheet "Tabulasi", cell Z4129 /6/
Value(s) of monitored parameter	19.6
Monitoring equipment	NA
Measuring/reading/recording frequency:	Annual
Calculation method (if applicable):	To be updated through the annual Biogas User Survey
QA/QC procedures:	-
Purpose of data:	To be used for the calculation of project emissions associated with bio-slurry usage – the CH ₄ emissions from the anaerobic decay of the residual organic content of digestate subjected to anaerobic storage
Additional comments:	-

The percentage value applied for use of bio-slurry comes from the survey done represented in BUS Tabulation 2023 file, dividing the results of question "76.a What is bio-slurry used for? Used for fertilizer on the farm itself" by 55 households with the total 285 households interviewed /6-7/.

SDG impacts:

Data/parameter:	GS-03 Soil condition
Unit	Number
Description	Soil condition refers to changes compared to the baseline in organic matter content.
Measured/calculated/default	Measured
Source of data	"BUS_2023_Tabulation_150702024.xlsx" sheet "Tabulasi", cell Z4129 /6/
Value(s) of monitored parameter	19.6%, equivalent to 3,979 households (19.6% * 20,252 biodigesters)
Monitoring equipment	NA
Measuring/reading/recording frequency:	Number of users applying the final biodigester slurry on agricultural land. Data is to be collected annually.
Calculation method (if applicable):	
QA/QC procedures:	

Purpose of data:	SDG impact monitoring
Additional comments:	-

The value applied on the parameter GS – 03 has been calculated from the extrapolation of the results of the survey carried out in BUS tabulation mentioned in the previous “Bio” parameter on all the bio-digesters installed throughout the VPA-1 (19.6% x 20,252 HHs), which equals 3,979 households using bio-slurry for fertilizer. That is to say, the result comes from multiplying the percentage of HHs using bio-slurry for fertilizer with the total biodigesters installed in the VPA /6-7/.

Data/parameter:	GS-06 Quality of employment
Unit	Number
Description	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 well as Health and Safety courses, as proven through issuance of a certificate to all constructors, will be monitored.
Measured/calculated/default	Measured
Source of data	IDBP Database. See: “2024_IDBP_Database_VPA1.xls” sheet “SPV” cells L211 and M211 /10/
Value(s) of monitored parameter	0 during the monitoring period 01/01/2023 – 31/12/2023. The trainings are conducted after new biodigesters are installed. In VPA1, there was no new installations in 2023 and hence no trainings were conducted. 1,382 during the lifetime of the project.
Monitoring equipment	NA
Measuring/reading/recording frequency:	
Calculation method (if applicable):	All vocational training and Health and Safety training attendees will be issued with a certificate proving their attendance, and a record of their names, contact details and gender, will be kept as part of the CME’s consolidated monitoring database. Data is to be collected annually.
QA/QC procedures:	This will be monitored through sampling to satisfy the requirements put forth by the methodology ‘Technologies and Practices to Displace Decentralized Thermal Energy Consumption’. Hard copies of all certificates issued will be kept by the CME.
Purpose of data:	SDG impact monitoring
Additional comments:	-

The audit team confirms through the source of data provided by the PP (2024_IDBP_Database_VPA1.xls, sheet “SPV”, cells M209, M210 and M211) the registration of 204 supervisors and 1,178 masons or constructors employed (see also “Mason” tab, cell N1186). These figures add up to a total of 1,382. However, as the installations of bio-digesters finalized in 2017 in the corresponded VPA-1, there have been 0 training records during the monitoring period 01/01/2023 – 31/12/2023.

Data/parameter:	GS-07 Livelihood of the poor
Unit	%
Description	Livelihood of the poor refers to changes compared to the baseline in living conditions, access to healthcare services including affordability and poverty alleviation.

Measured/calculated/default	Measured
Source of data	"BUS_2023_Tabulation_15072024.xlsx" sheet "Tabulasi", cells AD1834 - AD1836 /6-7/
Value(s) of monitored parameter	'No answer': 0 (equivalent to 0% of total units in operation) 'The same': 3,096 (equivalent to 15,3% of total units in operation) 'Improved': 17,156 (equivalent to 84.7% of total units in operation)
Monitoring equipment	NA
Measuring/reading/recording frequency:	Annually
Calculation method (if applicable):	Carried out as part of the annual Biogas User Survey conducted by the IDBP. As part of this survey the following question will be included: "Do you feel that your living conditions have a) improved, b) stayed the same, c) worsened; since the installation of the biogas digester?"
QA/QC procedures:	This will be monitored through sampling to satisfy the requirements put forth by the methodology 'Technologies and Practices to Displace Decentralized Thermal Energy Consumption'.
Purpose of data:	SDG impact monitoring
Additional comments:	-

Values applied to GS-07 have been verified through the source of data provided by the PP (BUS_2023_Tabulation_15072024 Excel file), sheet "Tabulasi", cells AD1834 - AD1836. The results of question 47 of the survey made: "Compared to before having biogas, what are your current social and economic living conditions?" The 84.7% of the responses were "Better", 15.3% "No change" and 0% "Worse" /6-7/.

Data/parameter:	GS-08 Access to affordable and clean energy services
Unit	Number
Description	Access to energy services refer to changes in unsustainable energy use.
Measured/calculated/default	Measured
Source of data	See: "Drop_off_BUS2023_rev.xlsx" sheet "Drop_off_2023" cell H30 /12/
Value(s) of monitored parameter	18,215 biodigester technologies in operation during monitoring period 01/01/2023 – 31/12/2023 and 20,252 biodigester technologies installed until 31/12/2023
Monitoring equipment	NA
Measuring/reading/recording frequency:	
Calculation method (if applicable):	
QA/QC procedures:	As per the VPA-DD, access to energy services refers to changes in unsustainable energy use. This parameter is monitored through the number of biogas units commissioned, and is therefore same as parameter 'N _{p1,y} '
Purpose of data:	SDG impact monitoring
Additional comments:	

Although YRE is in permanent contact with the households to keep track of the bio-digesters operation, the assessment of the parameter GS-08 is represented in the Drop-off BUS 2023. The percentage of units in operation are shown among the units built over the years of the VPA-1: age groups from 14 to 8, from 01/07/2009 to 31/12/2016 respectively: columns D and E. These percentages have been evaluated through the non-technical drop-off rate identified of the total households interviewed for each age group along the 9 provinces of the project.

The 18,215 units of biodigester technologies in operation shown in cell H30 have been estimated through the sum of number of biogas plants in operation in this VPA displayed by multiplying the corresponding % of units in operation (column E) with the units built in that period (column G).

Data/parameter:	GS-09 Human and institutional capacity
Unit	Number
Description	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.
Measured/calculated/default	Measured
Source of data	IDBP Database. See: "2024_IDBP_Database_VPA1.xls" sheet "O&M training" cell G14558 and H14558 /10/
Value(s) of monitored parameter	0 during the monitoring period 01/01/2023 – 31/12/2023. The trainings are conducted after new biodigesters are installed. In VPA1, there was no new installations in 2023 and hence no trainings were conducted. 4,050 during the lifetime of the project.
Monitoring equipment	NA
Measuring/reading/recording frequency:	
Calculation method (if applicable):	As per the VPA-DD, the number of women attending the Operation and Maintenance training as well as the bio-slurry utilization training are monitored to indicate changes in gender equality. This data concerns cumulative results over the VPAs lifetime.
QA/QC procedures:	This will be monitored through sampling to satisfy the requirements put forth by the methodology Technologies and Practices to Displace Decentralized Thermal Energy Consumption, Version 3.1.
Purpose of data:	SDG impact monitoring
Additional comments:	

Results of GS-09 parameter are observable through the IDBP Database Excel file, where men and women belonging to benefited households that have received operation, maintenance and bio-slurry utilization training are registered and shown in "O&M TRAINING" sheet. Therefore, 4,050 women have been counted by separating the genders of the beneficiaries (cell H14558), but 0 belong to this monitoring period 01/01/2023 – 31/12/2023 (cell G14558) because since 2017 biodigesters were no longer installed in the VPA-1.

Data/parameter:	GS-10 Quantitative employment and income generation
Unit	Number
Description	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.
Measured/calculated/default	

Source of data	Employment records and through the IDBP Database; Biogas User Survey: 2024_IDBP_Database_VPA1.xls sheet "SPV" cells L213 and M213 /10/ "BUS_2023_Tabulation_15072024.xlsx" sheet "Tabulasi" cell Z4131 /6/
Value(s) of monitored parameter	0 number of direct jobs created by the VPA during monitoring period 01/01/2023 – 31/12/2023 355 households sell the bio-slurry on the market (1.8% of total) 1,501 number of direct jobs created by the VPA during the lifetime of VPA As per the VPA-DD, the number of jobs generated by the VPA as well as the number of constructors employed is monitored. To evidence income generation, the number of users selling biogas slurry on the market is also monitored.
Monitoring equipment	NA
Measuring/reading/recording frequency:	Annually
Calculation method (if applicable):	Through the Biogas User Survey 2023 the number of users selling biogas slurry on the market will be monitored.
QA/QC procedures:	This will be monitored through sampling to satisfy the requirements put forth by the methodology Technologies and Practices to Displace Decentralized Thermal Energy Consumption, Version 3.1.
Purpose of data:	SDG impact monitoring
Additional comments:	-
<p>As mentioned before with GS-06, the audit team confirms through the source of data provided by the PP (2024_IDBP_Database_VPA1.xls) the registration of 204 supervisors ("SPV" tab), 1,178 masons ("Mason" tab) and 119 CPOs ("CPO" tab). These figures add up to a total of 1,501 (cell M214 of "SPV" tab) considered as the total jobs generated by the project. However, as the installations of bio-digesters finalized in 2017 in the corresponded VPA-1, there have not been created direct jobs during the monitoring period 01/01/2023 – 31/12/2023. On the other hand, the audit team confirms that 355 households sell bio-slurry (cell Z4131 of "Tabulasi" tab, from BUS Tabulation Excel file) due to the 1.8% result estimated on question 74. "What is bio-slurry used for? – For sale – both unprocessed/processed/made vermicompost" from the BUS Tabulation surveys; from the total 285 surveyed /6-7/.</p>	
Data/parameter:	GS-12 Technology transfer and technological self-reliance
Unit	Number
Description	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. Also, the entities outside of the programme in general and technical training about the functioning of the biogas technology to promote knowledge dissemination and strengthen the domestic biogas market will be monitored.
Measured/calculated/default	Measured
Source of data	Training records /13-15/ and through the IDBP Database. See: 2024_IDBP_Database_VPA1.xls sheet "O&M TRAINING" cell G14560 and H14560 /10/

Value(s) of monitored parameter	0 during monitoring period 01/01/2023 – 31/12/2023 14,529 during the lifetime of the VPA
Monitoring equipment	NA
Measuring/reading/recording frequency:	Annually
Calculation method (if applicable):	Records will be kept of all staff and their attendance at the vocational training programmes. All attendees will be issued with a certificate proving attendance and skills gained. Monitoring of this parameter will be combined with the monitoring of GS- 10. A record of all training held, and attendees, will be kept in the programme database.
QA/QC procedures:	This will be monitored through sampling to satisfy the requirements put forth by the methodology Technologies and Practices to Displace Decentralized Thermal Energy Consumption, Version 3.1.
Purpose of data:	SDG impact monitoring
Additional comments:	

Following the results described on GS-09 parameter above, the VVB has verified through the IDBP Database Excel file, that the total 14,529 benefited households that have received operation, maintenance and bio-slurry utilization training are registered and shown in “O&M TRAINING” sheet (see cell H14560). On the other hand, as there have not been bio-digester installations (cell G14560) since 2017 in VPA-1, there have not been training records for this monitoring period 01/01/2023 – 31/12/2023.

Data / Parameter	GS-13 Establishment of sustainable food production area
Unit	Hectare
Description	Area with application of bioslurry or compost.
Source of data	Collected through the annual Biogas User Survey. See: GS-13 calculation 2023_ver1.xls sheet 'Analysis' cell B28 /8/
Value(s) applied	305.10
Measurement methods and procedures	Area of agricultural land with application of final biodigester slurry. Data is to be collected annually.
Monitoring frequency	Annually.
QA/QC procedures	This will be monitored through sampling to satisfy the requirements put forth by the methodology Technologies and Practices to Displace Decentralized Thermal Energy Consumption (Version 3.1).
Purpose of data	SDG impact monitoring.
Additional comment	

The audit team deems 305.10 hectare/month as satisfactory through the estimation done by the PP in the source of data provided, where 1kg of bioslurry equals 0.266m² and the application of the area has been calculated from the total usage/month (kg) for whole bioslurry users by 12,853,246kg.

To verify the assumption where 1kg of bioslurry is 0.266m², the PD has provided to the audit team evidence (“BIOSLURRY APPLICATION_BIOGAS BOOK”), where it has been tested in China, by using bio slurry from bio digester, the following applications:

- 5,000 jin/mu, where 1 jin = 0.500 Kg and 1 mu = 0.066 ha.
- 0.066 ha = 666.666 m².
- Thus, by using 1 jin or 0.5 Kg of bio slurry, it will be able to cover around 0.133 m² land use. This means that while 2 jin or 1 Kg of bio slurry are applied, it will be able to cover around 0.266 m² land use /47/.

Data / Parameter	GS-14 Time saved
Unit	%
Description	The share of women indicating to save time by not having to collect biomass for cooking purposes after the installation of the biodigester.
Source of data	Collected through the annual Biogas User Survey. See: "BUS_2023_Tabulation_150702024.xlsx" sheet "Tabulasi", cell AE3203 and AC3203 /6/
Value(s) applied	95.4% (equivalent to 19,320 women)
Measurement methods and procedures	The BUS will ask respondents whether after the installation of a biodigester if they still collect firewood
Monitoring frequency	Annually.
QA/QC procedures	This will be monitored through sampling to satisfy the requirements put forth by the methodology Technologies and Practices to Displace Decentralized Thermal Energy Consumption (Version 3.1).
Purpose of data	SDG impact monitoring.
Additional comment	

In the BUS 2023 spreadsheet, sheet "Tabulasi", cell AE3203 and AC3203, the results of question 68. of the survey made: "Do you spend a lot of time looking for firewood for cooking (after biogas)?" The 95.4% of the responses were "Yes" and 4.6% /6-7/.

Data / Parameter	GS-15 Productive use of time
Unit	%
Description	Share of women indicating to use the additional saved time that has been freed up by not having to collect biomass for cooking purposes for income generating activities.
Source of data	Collected through the annual Biogas User Survey. See: "BUS_2023_Tabulation_1500702024.xlsx" sheet "Tabulasi" cell AC3211 /6/
Value(s) applied	22.0% (equivalent to 4,454 women)
Measurement methods and procedures	The BUS will ask respondents how they use the saved time, with income generation activities as one of the possible responses.
Monitoring frequency	Annually.
QA/QC procedures	This will be monitored through sampling to satisfy the requirements put forth by the methodology Technologies and Practices to Displace Decentralized Thermal Energy Consumption (Version 3.1).
Purpose of data	SDG impact monitoring.
Additional comment	

In "BUS_2023_Tabulation_1500702024.xlsx", sheet "Tabulasi", cells AC3211 and AC3212, the results of question 69 of the survey made: "After there is biogas, do you have other activities to supplement your income?" The 22% of the responses were "Yes", 78% "No" /6-7/.

All data and supporting evidence were verified and found consistent and correct, which are detailed in the appendix 3 of this report.

Findings	<p>CAR 01 - The following errors have been found on the 20241119 VPA1 MR v1.0:</p> <ol style="list-style-type: none"> 1. Some results on the total rows of table 8 on BUS 2023. 2. Website of reference 27 does not work. 3. Average value of monitored parameter of fraction usage rate: $U_{p1,y}$. 4. Value applied as usage rate for the equation to calculate the cumulative number of project technology-days ($N_{p1,y}$). 5. The following cells indicated in the sources of data of:
-----------------	--

- a. The average technology-days during which the biodigesters are operational for project scenario ($O_{p1,y}$).
 - b. GS-03 soil condition (p.29).
 - c. GS-10 Quantitative employment and income generation.
6. Value of Kerosene for quantity of fossil fuel consumed in project scenario ($BB_{p1,fuel}$), is not consistent with the source of data provided.
 7. Drop-off rate by 1.9% represented on page 39 for GS-13 Establishment of sustainable food production area, is not consistent with 'GS-13 calculation 2023 ver' file provided by the PP.
 8. The equivalent to 2.5% taken from BUS of total units in operation, for the households that sell the bio-slurry on the market (total of 355), shown on page 40 (Section E.2.) for GS-10 Quantitative employment and income generation, is not consistent with the 1.8% represented along the Monitoring Report (MR).
 9. In Section E.4., the project estimate (tCO_2e) is not consistent with the ER spreadsheet VPA-1 (tab GS VER 2023) provided by the PP.
 10. Values of the equation 'Actual values achieved during this monitoring period' on Section E.5. (third column of the table on page 43) are not correct.
 11. Date of the second column of table 17 is not correct.
 12. Reference 39 has an incorrect name of the supporting documentation.
 13. Calculation of Thermal energy demand (TJ/year) ($Fuel * NCV$) of table 21 for biomass and LPG are not correct.
 14. Average per household (tonne/tear) for kerosene by 0.051, does not match with the source of data indicated in reference 44.
 15. The website represented in the reference 48 does not work.
 16. The value of total VS entering the biodigester $kgVS.day^{-1}$ of the dairy cow on table 30 by 10.66 is not consistent with the ER spreadsheet.
 17. Values of monthly ER (tCO_2e) column of table 38 by 3,727 are not consistent with the ER spreadsheet for VPA-1

CL 01 - Provide evidence of the following:

1. Office training conducted on December 26, 2023.
2. 141 total of grievances with the respective responses/mitigation.
3. Some record of the staff and their attendance at the vocational training programmes, regarding the functioning of the biodigester technology.
4. Warranties on the biodigesters and stoves maintenance and replacements.
5. During the on-site visit, the PP mentioned that IDBP collaborated with one university from Jakarta in 2019 to do workshops on stoves modifications. Please provide any evidence related on this matter.

CL 02 - Clarification of the following points of the MR VPA-1 is required:

1. If PT. RASA has been in charge of implementing and analysis the BUS, KPT and Leakage Assessment since 2021 or 2023, due to different information reflected in the MR of VPA-1 and VPA-2.
2. If the office training conducted was on December 26, 2023 or 2024.
3. If the cluster size of the BUS 2023 (US + CMS) on the survey design summary of page 12 is 35-52 households or 45-59 as seems in the spreadsheets provided.
4. The following references are convenient:
 - a. Total sample size by for the KPT (PTF) by 89 (table 6 in p.11).
 - b. Samples of the database of table 12 (p.18).
 - c. Values represented on table 35.

5. If a total of 329 households was reached for VPA-1, with 221 households completing the interview, how 59 households have been reported as drop-offs if the difference is greater by 108 households?
6. Reference 18 (now 20) was improved indicating the data source.
7. Complete the dates indicated on page 15 on surveyors (section C) with the corresponding years.
8. For GS-14 Time saved on page 32, in the source of data, should not be question 68, rather than 47 (Cell AE3203)? This value seems for SDG1 (previous GS-07 described) in table1 of the MR.
9. Where can be found the bio-slurry usage as fertilizer by 24.6% according to the BUS, shown on page 40 for GS-13.
10. If the value of kerosene on table 22 is 0.641 or 0.214, according to the ER spreadsheet VPA-1 (cell E67, tab GS VER 2023). This way, clarify if the total of table 22 is correct.
11. Where to find the value 8/46 of households using more fuel (biomass, LPG and/or kerosene) because of the neighbor having a biogas digester; It is not 4/46 (formula cell E81 of GS VER 2023 tab in the ER spreadsheet VPA-1)?
12. How calculation of Emissions from fuel switch to biogas (tCO₂e/yr) of table 25 is made?
13. The value of PE_{p1,CH₄,y} (tCO₂e/year) of dairy cow on table 28. Are these values represented in the supporting documentation? References would be convenient.
14. For the applicability of leakage source 'b' of table 29, values displayed. The amount of leakage emission by 0.016 tCO₂e per year seems not to be consistent with the ER spreadsheet. In addition, corresponding cells shown on its references 59 and 60 are not clear.
15. In which supporting documentation can be found the values of Average B_{o,dig} (m³CH₄/kgVS) for cattle cow and beef cow in the last column of table 33. Reference would be convenient. Also, clarify if the sum of this column is 0.025 or 0.026.
16. If project emissions from bio-slurry equate 2.32 or 0.053 tCO₂e.

CL 03 - After the on-site visit and interviewed 50 households during the week of January 13th – 17th, 2025, the auditing team has identified the following households with some issues/responses of the households' owners (represented the ID plant serial number as reference of each household below), that are not consistent with the data represented in the IDBP Database of the project:

1. SGP0369 responded that all their cattle were sold (two cows) and nowadays they were sharing it with their neighbors. How the program monitors the bio-slurry and fuel consumed by the HHs in this type of situations?
2. PRP0017 responded 'Nayak' as the owner's name and 2013 as the date of the biodigester installation. However, according to the IDBP Database VPA1, owner's name is 'Abdullah' and the date of installation is 2012.
3. PRP0021 responded 'M. Ilham' as owner's name and 2013 as the biodigester date of installation. However, according to the IDBP Database VPA1, owner's name is 'Haerudin' and the date of installation is 2012. In addition, clarify why this HH was not in the list of the sampling plan ('LIST USER VERIFIKASI GS 2025_update13012025') of the on-site visit; neither as a main household to interview nor as a backup.
4. Why YSP0096 was not in the list of the sampling plan ('LIST USER VERIFIKASI GS 2025_update13012025') of the on-site visit; neither as a main household to interview nor as a backup?

	<p>CL 04 - After the on-site visit and interviewed 50 households (HHs) during the week of January 13th – 17th, 2025, the audit team has identified the following 11 households (ID plant serial number represented below) that were indicated to be from VPA-1, while they are represented in the supporting documentation '2024 IDBP Database VPA-2':</p> <ol style="list-style-type: none"> 1. YSP1619 2. YSP1626 3. YSP1623 4. YSP1627 5. SGP0354 6. PCP0264 7. PCP0266 8. SGP0370 9. SGP0369 10. SGP0387 11. SGP0388 <p>FAR 01 - After the on-site visit of this verification (MP), the auditing team identified the household SGP0369 (id number of the biodigester) responding that all their cattle were sold (two cows) recently, and that during the present moment they were sharing it with their neighbors. As the PP confirmed that this kind of situations are likely, being accounted as 'drop-off', VVB shall consider it for the next verification, and verify that this household is accounted as drop-off in the DDBB of the project for 2024.</p> <p>Appendix 4 summarizes the findings from the desk review of the Monitoring Report /4/, the calculation spreadsheets /5/ and other supporting documents as well as findings from the interviews.</p>
Conclusion	<p>AENOR verification team confirms that:</p> <ul style="list-style-type: none"> • The monitoring has been carried out in accordance with the monitoring plan in the registered VPA-DD. • All parameters required by the monitoring plan have been measured/determined without material misstatements and in line with all applicable standards and relevant requirements. • The registered monitoring plan has been properly implemented and followed by the project participants. • All parameters stated in the registered monitoring have been monitored and updated as applicable • The equipment used for monitoring is controlled and calibrated in accordance with the registered monitoring plan, the applied methodology and the national standard. • Monitoring results are consistently recorded as per the approved frequency. • The veracity of the data based on the total HHs interviewed by the PP among the 9 provinces of the project. • Quality assurance and quality control procedures have been applied in accordance with the registered monitoring plan /1-2/.

D.6.3. Implementation of sampling plan

Means of verification	<p>The verification team has checked whether the PP has applied a sampling approach to determine the monitored values.</p> <p>Further it has been checked whether the PP has correctly applied the implemented sampling plan including</p> <ol style="list-style-type: none"> (i) description of the implemented sampling design (ii) collected data (iii) analysis of collected data (iv) demonstration on whether the required confidence/precision has been met.
------------------------------	---

AENOR in accordance with the methodology monitoring requirements set forth in the methodology Technologies and Practices to Displace Decentralized Thermal Energy Consumption (Version 3.1), has checked the following parameters:

Item	BUS 2023 (US + CMS)	KPT (PFT)	KPT (BFT)
Sampling method	Households with a biodigester that has been in use for at least 6 months for each age group	Simple random sampling	Simple random sampling using PFT sampling frame
Cluster	Age group	N/A	N/A
Cluster size	35 – 59 households	N/A	N/A
Number of clusters	7 cluster were determining in accordance with the study and in accordance with the GS definition	N/A	N/A
Total sample size	329	89	39
Cross-checked	AENOR cross checked the sampling with the guidance of the applied GS methodology and the UNFCCC standard on sampling ('Standard for Sampling and Surveys for CDM Project Activities and Programme of Activities' (EB 69, Annex 4)) and BUS Tabulation 2023 /35-36//6/.	AENOR cross checked the sampling with the guidance of the applied GS methodology, the Biogas KPT, 2023 excel and questionnaire design, the Berkeley Air Kitchen Performance test questionnaire /9//26//46/. The significant results were also cross check with the Outlier calculator (graphpad.com).	AENOR cross checked the sampling with the guidance of the applied GS methodology, the Biogas KPT 2023, 2023 excel, questionnaire design, the Berkeley Air Kitchen Performance test questionnaire /9//26//46/. The significant results were also cross checked with the Outlier calculator (graphpad.com)

Findings

No finding was raised regarding this issue.

Conclusion

The sampling has been developed according to the stated in the VPA-DD and the supporting information. The sampling results must meet the 90% confidence and 10% precision limit. This analysis was carried out per user group (i.e. households, SMEs, communities) and differentiated between small-scale digesters (defined as capacity up to 12m³) and medium-scale digesters (defined as capacities larger than 12m³). The households were selected using simple random sampling applied cross all nine provinces in accordance with TPDDTEC v3.1.

	The PP demonstrates, by means of the simple random that the 90/10 confidence/precision is achieved so the estimated values are considered correct and no need for additional sampling efforts is required.
--	--

D.7. Compliance with the calibration frequency requirements for measuring instruments

Means of verification	AENOR has verified the information stated in all the calibration certificates of the different equipment installed in the project and also their technical specifications from manufacturers in the current verification process.
Findings	No finding was raised regarding this issue.
Conclusion	AENOR verification team confirms that the calibration is conducted at the frequency specified by the methodology and the registered monitoring plan /1-2/.

D.8. Assessment of data and calculation of SDG Impacts

D.8.1. Calculation of baseline value or estimation of baseline situation of each SDG Impact

Means of verification	Baseline estimates were calculated according to the GS4GG as follows:		
	SDG indicator	GS indicator	Baseline situation
	SDG 13: Climate action	Climate change	Baseline emissions from fuel consumption: 103,835 tCO ₂ e
	SDG 7: Affordable and Clean Energy	GS-08 Access to affordable and clean energy services	No access to biodigester technology. Combustion of LPG, kerosene and biomass continues to lead to particulate matter and carbon monoxide pollution and deforestation.
		GS-12 Technology transfer and technological self-reliance	No training opportunities and transfer of technology in the biogas sector.
	SDG 5: Gender Equality	GS-09 Human and institutional capacity	No development as women spent much of their time collecting biomass and cooking, and remain with little spare time to undertake activities that stimulate personal and entrepreneurial development.
		GS-14 Time saved	No time savings, as women spend a significant proportion of their time having to collect biomass for cooking purposes.
		GS-15 Productive use of time	No productive use of time as women lack spare time to pursue income generating activities.
	SDG 2: No Hunger	GS-03 Soil condition	No slurry is used as fertilizer on agricultural land (in terms of number of farmers).
		GS-13 Establishment of sustainable food production area	No slurry is used as fertilizer on agricultural land (in terms of area).
	SDG 1: No Poverty	GS-06 Quality of employment	No training and employment opportunities linked to biogas market.
		GS-07 Livelihood of the poor	Livelihood of the poor is unchanged.

	GS-10 Quantitative employment and income generation	No training and employment opportunities linked to biogas market.
	<p>SDG 13: Baseline emissions from fuel consumption: $BE_{b1CO2,y} = (\sum_b BB_{b1,fuel} * NCV_{fuel} * EF_{b1,fuel}) + (BB_{b1,bio} * NCV_{bio} * EF_{b1,bio} * f_{NRB})$ Baseline emissions from the animal waste management system: $BE_{b1,CH4,y} = GWP_{CH4} * \sum_T (EF_{awms,T} * N_{T,h})$ Together amounting to (after correcting for drop off): 103,835 tCO₂e</p>	
Findings	No finding was raised regarding this issue.	
Conclusion	AENOR verification team confirms that: <ul style="list-style-type: none"> • A complete set of data for the monitoring period is available. • Calculations of baseline emissions have been carried out in accordance with the formulae and methods described in the monitoring plan and the applied methodology /1-2/. • Appropriate emission factor, IPCC default values and other reference values have been correctly applied. • No errors, miscalculations, omissions, misstatements or incomplete information have been identified. 	

D.8.2. Calculation of project value or estimation of project situation of each SDG Impact

Means of verification	Project estimates were calculated according to the GS4GG as follows:		
	SDG indicator	GS indicator	Project situation
	SDG13: Climate action	Climate change	57,523 tCO ₂ e
	SDG 7: Affordable and Clean Energy	GS-08 Access to affordable and clean energy services	18,215 units in operation 20,252 biodigester technologies installed
		GS-12 Technology transfer and technological self-reliance	0 users attending training during monitoring period 14,529 users attending training during the lifetime of the project
	SDG 5: Gender Equality	GS-09 Human and institutional capacity	0 women attend the Operation and Maintenance training during monitoring period 4,050 women attend the Operation and Maintenance training during the lifetime of the project
		GS-14 Time saved	19,320 women reporting to have saved time (95.4% of the 20,252 HHs with biodigesters installed)
		GS-15 Productive use of time	4,454 women reporting to have more time for productive use (22.0% of the 20,252)
	SDG 2: No Hunger	GS-03 Soil condition	3,979 households use bio-slurry on land

	GS-13 Establishment of sustainable food production area	305.10 hectares applying bio-slurry
SDG 1: No Poverty	GS-06 Quality of employment	0 in 2023 during monitoring period 1,382 people attending vocational training during the lifetime of the project
	GS-07 Livelihood of the poor	'No answer': 0 (equivalent to 0% of total units in operation) 'The same': 3,096 (equivalent to 15.3% of total units in operation) 'Improved': 17,156 (equivalent to 84.7% of total units in operation)
	GS-10 Quantitative employment and income generation	0 number of direct jobs created by the VPA 355 households sell the bio-slurry on the market
<p>SDG 13: Project emissions from fuel consumption: $PE_{p1,CO2,y} = \sum (BB_{p1,fuel} * NCV_{fuel} * EF_{p1,fuel}) + (BB_{p1,bio} * NCV_{bio} * EF_{p1,bio} * f_{NRB})$ </p> <p>Project emissions from the animal waste management system: $PE_{p1,CH4,y} = GWP_{CH4} * \sum (N_{T,h,y} * EF_{awms,T}) * PL_y + \sum (N_{T,h,y} * EF_{awms,T}) * (1 - \eta_{new\ stove}) * (1 - PL_y) + PE_{awms,NT}$ </p> <p>Together amounting to after correcting for drop off: 57,523 tCO_{2e}</p> <p>SDG 7: 18,215 units in operation and 20,252 biodigester technologies installed, calculated by tracking in the IDBP database all eligible biodigesters installed until 31/12/2023. 0 users attending training during monitoring period 01/01/2023 – 31/12/2023 according to training records.</p> <p>SDG 5: 0 women attend the Operation and Maintenance training during monitoring period 01/01/2023 – 31/12/2023 according to training records. 19,320 women reporting to have saved time, as calculated by the BUS survey responses with 95.4% of the 20,252 biodigesters installed (0.954* 20,252 = 19,320) 4,454 women reporting to have more time for productive use, as calculated by the BUS survey responses with 22.0% of the 20,252 biodigesters installed (0.22* 20,252 = 4,454)</p> <p>SDG 2: 3,979 households use bio-slurry on land, as calculated by the BUS survey responses with 19.6% of the 20,252 biodigesters installed (0.196* 20,252 = 3,979) 305.10 hectares applying bio-slurry, per month, calculated by correcting the total units (20,252) by the drop-off rate (9.29%) and multiplying it by bio-slurry usage as fertilizer according to the BUS (19.6%) and finally applying conversions to get to hectares</p> <p>SDG 1:</p>		

	<p>0 people attending vocational training in the monitoring period 01/01/2023 – 31/12/2023 according to training records</p> <p>Livelihood of the poor ‘no answer’: 0 (equivalent to 0% of total units in operation), ‘the same’: 3,096 (equivalent to 15.3% of total units in operation), ‘improved’: 17,156 (equivalent to 84.7% of total units in operation) according to survey</p> <p>0 number of direct jobs created by the VPA during monitoring period according to records</p> <p>355 households sell the bio-slurry on the market (equivalent to 1.8% taken from BUS of total units in operation (20,252) during the monitoring period /6-7/.</p>
Findings	No finding was raised regarding this issue.
Conclusion	<p>AENOR verification team confirms that:</p> <ul style="list-style-type: none"> • A complete set of data for the monitoring period is available. • Calculations of project emissions have been carried out in accordance with the formulae and methods described in the monitoring plan and the applied methodology. • Appropriate emission factor, IPCC default values and other reference values have been correctly applied. • Questions regarding SDG impacts on the project period were designed and made in the household interviews during the on-site visit to confirm the results reported are reliable and realistic. • No errors, miscalculations, omissions, misstatements or incomplete information has been identified. <p>In AENOR’s opinion, monitoring practices are deemed appropriate and consistent with the monitoring plan /1-2/.</p>

D.8.3. Calculation of leakage GHG emissions

Means of verification	<p>Leakage is monitored every 2 years using survey methods to satisfy the requirements put forth by the methodology TPDDTEC v3.1 requirements. Leakage is calculated as the usage of non-renewable biomass and fossil fuel. The leakage assessment was carried out as part of the BUS 2023. Leakage per household per year was calculated as a quantitative emissions volume (tCO_{2e}).</p> <p>According to the results reported by households that are neighbors to biogas users, 4/46 of the households uses more fuel (biomass, LPG, and/or kerosene) because of the neighbors having a biogas digester. This amounts to household leakage emissions of 0.067 tCO_{2e} per year.</p> <p>The audit team checked the calculations on spreadsheets and information in the MR, along with the surveys regarding leakage.</p>
Findings	<p>CL 02 was raised.</p> <p>Appendix 4 summarizes the findings from the desk review of the Monitoring Report /4/, the calculation spreadsheets /5/ and other supporting documents as well as findings from the interviews.</p>
Conclusion	<p>AENOR verification team confirms that:</p> <ul style="list-style-type: none"> • A complete set of data for the monitoring period is available. • Calculations of emission reductions have been carried out in accordance with the formulae and methods described in the monitoring plan and the applied methodology /1-2/. • Appropriate emission factor, IPCC default values and other reference values have been correctly applied. • No errors, miscalculations, omissions, misstatements or incomplete information has been identified.

Thus, calculations of leakage are deemed correct.

D.8.4. Summary calculation of net benefits or direct calculation for each SDG Impact

Means of verification	Net benefits were calculated according to the GS4GG as follows:				
	SDG	SDG Impact	Baseline estimate	Project estimate	Net benefit
	SDG13: Climate action	Climate change	Baseline emissions from fuel consumption: 103,835 tCO ₂ e	57,523 tCO ₂ e	45,098 tCO ₂ e
	SDG 7: Affordable and Clean Energy	GS-08 Access to affordable and clean energy services	No access to biodigester technology. Combustion of LPG, kerosene and biomass continues to lead to particulate matter and carbon monoxide pollution and deforestation.	18,215 units in operation 20,252 biodigesters installed	18,215 units in operation 20,252 biodigesters installed
		GS-12 Technology transfer and technological self-reliance	No training opportunities and transfer of technology in the biogas sector.	0 users attending training during monitoring period 14,529 users attending training during the lifetime of the project	0 users attending training during monitoring period 14,529 users attending training during the lifetime of the project
	SDG 5: Gender Equality	GS-09 Human and institutional capacity	No development as women spent much of their time collecting biomass and cooking, and remain with little spare time to undertake activities that stimulate personal and entrepreneurial development.	0 women attend the Operation and Maintenance training during monitoring period 4,050 women attend the Operation and Maintenance training during the lifetime of the project	0 women attend the Operation and Maintenance training during monitoring period 4,050 women attend the Operation and Maintenance training during the lifetime of the project
		GS-14 Time saved	No time savings, as women spend a significant proportion of their time having to collect biomass for cooking purposes.	19,320 women reporting to have saved time (95.4% of the 20,252 biodigesters installed)	19,320 women reporting to have saved time (95.4% of the 20,252 biodigesters installed)
		GS-15 Productive use of time	No productive use of time as women lack spare time to pursue income	4,454 women reporting to have more time for productive use (22.0% of the 20,252)	4,454 women reporting to have more time for productive use (22.0% of the 20,252)

			generating activities.	biodigesters installed)	biodigesters installed)	
	SDG 2: No Hunger	GS-03 Soil condition	No slurry is used as fertilizer on agricultural land (in terms of number of farmers).	3,979 households use bio-slurry on land	3,979 households use bio-slurry on land	
		GS-13 Establishment of sustainable food production area	No slurry is used as fertilizer on agricultural land (in terms of area).	305.10 hectares applying bio-slurry	305.10 hectares applying bio-slurry	
	SDG 1: No Poverty	GS-06 Quality of employment	No training and employment opportunities linked to biogas market.	0 in the 2023 during monitoring period 1,382 people attending vocational training during the lifetime of the project	0 in the 2023 during monitoring period 1,382 people attending vocational training during the lifetime of the project	
		GS-07 Livelihood of the poor	Livelihood of the poor is unchanged.	'No answer': 0 (equivalent to 0% of total units in operation) 'The same': 3,096 (equivalent to 15.3% of total units in operation) 'Improved': 17,156 (equivalent to 84.7% of total units in operation)	'No answer': 0 (equivalent to 0% of total units in operation) 'The same': 3,096 (equivalent to 15.3% of total units in operation) 'Improved': 17,156 (equivalent to 84.7% of total units in operation)	
		GS-10 Quantitative employment and income generation	No training and employment opportunities linked to biogas market.	0 number of direct jobs created by the VPA (1,501 number of direct jobs created by the VPA during the lifetime of the project) 355 households sell the bio-slurry on the market	0 number of direct jobs created by the VPA (1,501 number of direct jobs created by the VPA during the lifetime of the project) 355 households sell the bio-slurry on the market	
	<p>SDG 13: Emissions reductions</p> $ER\ y = BE\ y - PE\ y - LE\ y$ <p>Together amounting to after correcting for drop off: 45,098tCO₂e.</p>					
	Findings	No finding was raised regarding this issue.				
	Conclusion	<p>AENOR verification team confirms that:</p> <ul style="list-style-type: none"> • A complete set of data for the monitoring period is available. • Calculations of emission reductions have been carried out in accordance with the formulae and methods described in the monitoring plan and the applied methodology. 				

	<ul style="list-style-type: none"> • Appropriate emission factor, IPCC default values and other reference values have been correctly applied. • No errors, miscalculations, omissions, misstatements or incomplete information has been identified.
--	---

D.8.5. Comparison of actual SDG Impacts with estimates in validated PDD

Means of verification	<p>As the VPA-DDs was developed prior to the GS for Global Goals, most of the ex-ante SDG impacts were not reported.</p> <table border="1" style="width: 100%; border-collapse: collapse;"> <thead> <tr> <th style="width: 15%;"></th> <th style="width: 45%;">Current MP</th> <th style="width: 40%;">PDD estimate</th> </tr> </thead> <tbody> <tr> <td>SDG 13</td> <td>Total emission reduction: 45,098 tCO₂e/ this monitoring period.</td> <td>Total emission reduction: 55,056 tCO₂e/ ex ante estimate in PDD.</td> </tr> <tr> <td rowspan="3">SDG 7: Affordable and Clean Energy</td> <td>18,215 units in operation</td> <td>20,253 biodigester technologies installed.</td> </tr> <tr> <td>20,252 biodigesters installed</td> <td></td> </tr> <tr> <td>0 users attending training.</td> <td>-</td> </tr> <tr> <td rowspan="3">SDG 5: Gender Equality</td> <td>0 women attend the Operation and Maintenance training.</td> <td>-</td> </tr> <tr> <td>19,320 women reporting to have saved time.</td> <td>-</td> </tr> <tr> <td>4,454 women reporting to have more time for productive use.</td> <td>-</td> </tr> <tr> <td rowspan="2">SDG 2: No Hunger</td> <td>3,979 households use bio-slurry on land</td> <td>-</td> </tr> <tr> <td>305.10 hectares applying bio-slurry, per month</td> <td>-</td> </tr> <tr> <td rowspan="3">SDG 1: No Poverty</td> <td>0 number of direct jobs created by the VPA 355 households sell the bio-slurry on the market (1.8% of total)</td> <td>-</td> </tr> <tr> <td>'No answer': 0 (equivalent to 0% of total units in operation) 'The same': 3,096 (equivalent to 15.3% of total units in operation) 'Improved': 17,156 (equivalent to 84.7% of total units in operation)</td> <td>-</td> </tr> <tr> <td>0 vocational trainings conducted</td> <td>-</td> </tr> </tbody> </table> <p>In regard to SDG 13, the ex-post value is higher than the VPA-DD estimate due to the update of the GWP CH₄ value from 25 to 28 in accordance with the rule update of Applicability of Global Warming Potential For Gold Standard for the Global Goals Projects.</p> <p>For SDG 7, the difference is due to one unit been taken out as it related to a household that switched to using tofu as input for feed, rather than dung.</p>		Current MP	PDD estimate	SDG 13	Total emission reduction: 45,098 tCO ₂ e/ this monitoring period.	Total emission reduction: 55,056 tCO ₂ e/ ex ante estimate in PDD.	SDG 7: Affordable and Clean Energy	18,215 units in operation	20,253 biodigester technologies installed.	20,252 biodigesters installed		0 users attending training.	-	SDG 5: Gender Equality	0 women attend the Operation and Maintenance training.	-	19,320 women reporting to have saved time.	-	4,454 women reporting to have more time for productive use.	-	SDG 2: No Hunger	3,979 households use bio-slurry on land	-	305.10 hectares applying bio-slurry, per month	-	SDG 1: No Poverty	0 number of direct jobs created by the VPA 355 households sell the bio-slurry on the market (1.8% of total)	-	'No answer': 0 (equivalent to 0% of total units in operation) 'The same': 3,096 (equivalent to 15.3% of total units in operation) 'Improved': 17,156 (equivalent to 84.7% of total units in operation)	-	0 vocational trainings conducted	-
	Current MP	PDD estimate																															
SDG 13	Total emission reduction: 45,098 tCO ₂ e/ this monitoring period.	Total emission reduction: 55,056 tCO ₂ e/ ex ante estimate in PDD.																															
SDG 7: Affordable and Clean Energy	18,215 units in operation	20,253 biodigester technologies installed.																															
	20,252 biodigesters installed																																
	0 users attending training.	-																															
SDG 5: Gender Equality	0 women attend the Operation and Maintenance training.	-																															
	19,320 women reporting to have saved time.	-																															
	4,454 women reporting to have more time for productive use.	-																															
SDG 2: No Hunger	3,979 households use bio-slurry on land	-																															
	305.10 hectares applying bio-slurry, per month	-																															
SDG 1: No Poverty	0 number of direct jobs created by the VPA 355 households sell the bio-slurry on the market (1.8% of total)	-																															
	'No answer': 0 (equivalent to 0% of total units in operation) 'The same': 3,096 (equivalent to 15.3% of total units in operation) 'Improved': 17,156 (equivalent to 84.7% of total units in operation)	-																															
	0 vocational trainings conducted	-																															
Findings	No finding was raised regarding this issue.																																
Conclusion	<p>The AENOR CONFIA verification team confirms that:</p> <p>A comparison of actual GHG emission reductions or net anthropogenic GHG removal of the programme achieved during this monitoring period with the estimates in the registered VPA-DD has been provided.</p> <p>The verification team considers that the calculation of the comparison is correct.</p>																																

D.8.6. Remarks on difference from estimated value in registered PDD

Means of verification	The actual emission reductions achieved during the current monitoring period are lower than the emission reductions stated in the registered PDD.
Findings	No finding was raised regarding this issue.
Conclusion	The comparison of emission reductions is transparently included in the Monitoring report. It is not necessary to provide a justification because the emission reductions achieved during the current monitoring period are lower than the emission reductions stated in the registered PDD.

D.9. Local stakeholder consultation process

During the interviews with local people, the verification team confirmed that local stakeholders are satisfied about the project, in general, because although some specific situation can cause discomfort in someone the communication channels with the project staff are clear and available and appropriate answer to each problem is provided quickly.

The audit team interviewed during the on-site visit the following PP team to verify the correct function of the grievance mechanism of the program:

- Chabi Batur Romzini as Biru Karbon Nusantara IDBP Program Assistant,
- Nannuba Hilma as Biru Karbon Nusantara IDBP Program Assistant,
- Danastri Widoningtyas as IDBP Program Assistant (Yayasan Rumah Energi, YRE),
- Krisna Wijaya as IDBP Program Assistant (YRE),
- Alwan Wijaya as local community coordinator,
- Sahrin as local farmers group representative.

The PP team explained that the village coordinators are in permanent contact with the members of the benefited households, YRE and PT. BKN. The HHs that report incidents with the biodigester get on a waiting list of a repairment program managed by project participants and are periodically attended to address the grievances. The frequency of attendance depends on the demand of families with incidents claimed and the delay can take several months. The local partners are the main actors to repair the physical incidents of the program activity. They sell to the affected family the stove or parts of it to be repaired if necessary and help them to install it. The local partner is always being supervised and coordinated by YRE. The different phases of communication of this process are explained on Section G of the MR: 1. IDBP hotline, 2. directly contact YRE field officer and 3. Directly contact to the CPO.

The audit team verified the external communication record for 2023 where all the input/grievances received are registered and the evidence of some of the answers delivered to the input/grievances received. There were just 141 grievances during the monitoring report that were closed and no grievances ongoing after. Hence it is accepted by the verification team /17-18/.

The grievances registered in the database has been provided as evidence asked by the audit team, as explained in the finding of Section D.1 above. This database registers the following information about each HH that intervenes:

- Number
- ID Plant
- User name
- Construction date
- Corresponding VPA
- Address
- CPO name
- Grievance date of claiming
- Grievance receiver

- Problem description
- Grievance date of response
- Response description
- Photo of the stoves with the main HH member

D.10. Double counting of emissions reductions

According to the rules stated by Gold Standard, to assure that no double counting could happen AENOR has verified during the desk review and the interviews that all biogas obtained from the programme is registered and used by the GS project and no other carbon project exist close that can use the same biogas or installations. Furthermore, in the IDBP database each biodigester has a unique number and different construction date /25/. Thus, the database does not allow for double-entries. The records of biogas units were checked by the audit team.

In addition, the audit team reviewed the platforms of CDM (<https://cdm.unfccc.int/Projects/projsearch.html>), GS (<https://registry.goldstandard.org/projects?q=&page=1>), EcoRegistry (<https://www.ecoregistry.io/projects-list/cercarbono-co2>), CSA GHG Clean projects Registry (https://www.csaregistries.ca/GHG_VR_Listing/CleanProjectProjects) and VCS platform (<https://registry.terra.org/app/search/VCS/Registered>), and has verified that the Indonesia Domestic Biogas Programme of Activities (IDBP VPA-1) is not registered in these GHG schemes.

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

SECTION E. Internal quality control

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

SECTION F. Verification opinion

AENOR has performed the verification of the emission reductions of the “Indonesia Domestic Biogas Programme of Activities” VPA-1 GS1174 for the period from 01/01/2023-31/12/2023.

The verification approach was based on the requirements as defined under the Kyoto Protocol, Marrakech accord, Montreal COP/MOP 1, Nairobi COP/MOP 2 as well as those defined by the CDM Executive Board and GS4GG.

AENOR planned and performed the verification to obtain the information, explanations and evidence considered necessary to provide sufficient evidence to give reasonable assurance that the amount of GHG emission reductions for the reporting period, prepared on the basis of both the registered monitoring plan and the final monitoring report, are fairly stated.

AENOR conducted the verification with regard to the monitoring plan included in the registered Project Design Document, and the applied methodology as registered for the project. This assessment included:

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

AENOR CONFIA has verified whether the information included in the final monitoring report is correct and that the emissions reductions achieved have been determined correctly. In AENOR's opinion, GHG emissions reported for the project in the final monitoring report are fairly stated.

The GHG emission reductions were calculated without material errors, omissions or misstatements in a conservative and appropriate manner according to the approved methodology “Technologies and Practices to Displace Decentralized Thermal Energy Consumption” version 3.1 and the monitoring plan and formulae provided in the registered VPA-DD.

SECTION G. Certification statement

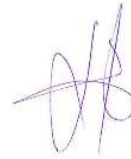
AENOR is able to certify that the results achieved by the “Indonesia Domestic Biogas Programme of Activities” VPA-1 GS1174 for the period from 01/01/2023-31/12/2023 amount to 45,098 GS GSVERs.

Sustainable Development Goals Targeted	SDG Impact	Amount Achieved	Units/ Products
SDG 13: Climate Action	Climate change	45,098	VER
SDG 7: Affordable and Clean Energy	GS-08 Access to affordable and clean energy services	18,215	Units in operation
	GS-12 Technology transfer and technological self-reliance	0	Users attending training
SDG 5: Gender Equality	GS-09 Human and institutional capacity	0	Women attending Operation and Maintenance training
	GS-14 Time saved	19,320	Women reporting to have saved time
	GS-15 Productive use of time	4,454	Women reporting to have more time for productive use
SDG 2: No Hunger	GS-03 Soil condition	3,979	Households using bio-slurry on land
	GS-13 Establishment of sustainable food production area	305.10	Hectares applying bio-slurry, per month
SDG 1: No Poverty	GS-06 Quality of employment	0	Vocational trainings conducted
	GS-07 Livelihood of the poor	0	‘No answer’
		3,096	‘The same’
		17,156	‘Improved’
GS-10 Quantitative employment and income generation	0	Number of direct jobs created by the VPA	
	355	Households selling bio-slurry	

Madrid, July 30, 2025.



Asís Arranz Arbex
Team Leader



José Luis Fuentes
Climate Change Manager

Appendix 1. Abbreviations

Abbreviation	Full text
AENOR	AENOR CONFIA S.A.U.
BKN	Biru Karbon Nusantara
BUS	Biogas User Survey
CAR	Corrective Action Requests
CDM	Clean development mechanism
CL	Clarification Actions
EF	Emissions factor
ER	Emission reduction
FAR	Forward action requests
GHG	Greenhouse gas
GS	GoldStandard
GS4GG	Gold Standard for the global Goals
GWP	Global warming potential
IDBP	Indonesia Domestic Biogas Programme of Activities
IPCC	Intergovernmental Panel on Climate Change
IR	Internal resources
KPT	Kitchen Performance Test
LPG	Liquified petroleum gas
MP	Monitoring period
MR	Monitoring report
MW	Megawatt
N/A	Not applicable
PP	Project proponent
QA/QC	Quality assessment/quality control
SDG	Sustainable development goal
Tco2	Tons of carbon dioxide

Abbreviation	Full text
TJ	Tera Joules
TPDDTEC	Technologies and Practices to Displace Decentralized Thermal Energy Consumption
UNFCCC	United Nations Framework Convention on Climate Change
VER	Verified emission reductions
VPA	Validated project design document
VPA-DD	Component project design document
VVB	Validation and verification body
YRE	Yayasan Rumah Energy

Appendix 2. Competence of team members and technical reviewers

CERTIFICATE OF QUALIFICATION

Subject: Verification and Technical Review Team for “Indonesia Domestic Biogas Programme of Activities (IDBP) (GS 1174)”

Madrid, 30/07/2025

Hereby I confirm the following records of qualification, according to Gold Standard approved Validation and Verification Bodies and in relation with the verification process of the above mentioned programme:

Name: Asís Arranz Arbex

GS Team Leader: Yes

GS Validator: N/A

GS Verifier: Yes

GS Technical Reviewer: N/A

External Technical Expert: N/A

Technical areas related with the project activity:

Community Service Activities



Jose Luis Fuentes

Climate Change Manager

CERTIFICATE OF QUALIFICATION

Subject: Verification and Technical Review Team for “Indonesia Domestic Biogas Programme of Activities (IDBP) (GS 1174)”

Madrid, 30/07/2025

Hereby I confirm the following records of qualification, according to Gold Standard approved Validation and Verification Bodies and in relation with the verification process of the above mentioned programme:

Name: Luís Javier Arribas Alonso

GS Team Leader: N/A

GS Validator: N/A

GS Verifier: Yes

GS Technical Reviewer: N/A

External Technical Expert: N/A

Technical areas related with the project activity:

Community Service Activities



Jose Luis Fuentes
Climate Change Manager

CERTIFICATE OF QUALIFICATION

Subject: Verification and Technical Review Team for “Indonesia Domestic Biogas Programme of Activities (IDBP) (GS 1174)”

Madrid, 30/07/2025

Hereby I confirm the following records of qualification, according to Gold Standard approved Validation and Verification Bodies and in relation with the verification process of the above mentioned programme:

Name: Richard Gonzales Toledo

GS Team Leader: N/A

GS Validator: N/A

GS Verifier: N/A

GS Technical Reviewer: Yes

External Technical Expert: N/A

Technical areas related with the project activity:

Community Service Activities

A handwritten signature in blue ink, appearing to read 'JL Fuentes', with a stylized flourish extending to the left.

Jose Luis Fuentes
Climate Change Manager

Appendix 3. Documents reviewed or referenced

No.	Author	Title	References to the document	Provider
1	PP	Registered GS VPA-DD	version 10.2	GS Website
2	PP	Monitoring plan registered	version 10.2	GS Website
3	PP	Monitoring report	version 0.1	PP
4	PP	Monitoring report	version 0.5	PP
5	PP	20240930 ER Calculation VPA1 MP6 CP2	2025	PP
6	PP	BUS 2023 Tabulation_15072024	2025	PP
7	PP	Raw data BUS_15072024	2024	PP
8	PP	20250213 GS-13 calculation 2023_ver1	2025	PP
9	PP	20240705 KPT December 2023 YRE1	version 1	PP
10	PP	2024 IDBP Database VPA1	version 1	PP
11	PP	20240915 Leakage Output 2023	2024	PP
12	PP	Drop off BUS2023_rev	2024	PP
13	PP	List O&M Training 2023_rev	2024	PP
14	PP	Photo 20231226_105343	2023	PP
15	PP	Attendance List	2023	PP
16	PP	List Women in Training_rev	2024	PP
17	PP	List of Grievances VPA1	2025	PP
18	PP	Grievance records	2025	PP
19	PP	Report StoveModificationTraining in IDBPReport2018	2018	PP
20	PP	Photos StoveModificationTraining	2023	PP
21	PP	ATL Vocational Training 1	May 2016	PP
22	PP	ATL Vocational Training 2	March 2016	PP
23	PP	ATL Vocational Training 3	August 2016	PP
24	PP	ATL Vocational Training Lampung	2013	PP
25	PP	Warranties on Biodigester and stove maintenance	2023-2025	PP

No.	Author	Title	References to the document	Provider
26	AENOR	Questionnaire Biodigesters YAYASAN v1_cb comments	2025	PP
27	PP	MOU Hivos-YRE	-	PP
28	GS	Gold Standard for the global Goals, Principles and Requirements	version 2	GS Website
29	GS	Gold Standard for the Global Goals, Community Services Activities Requirements	version 1.2	GS Website
30	UNFCCC	CDM Validation and Verification Standard for programmes of activities	Version 03.0	UNFCCC Website
31	AENOR	GS Verification Report VPA1 - previous monitoring period 2022	Version 4	AENOR
32	GS	Template Guide - Monitoring report	Version 1.1	GS Website
33	GS	Technologies and Practices to Displace Decentralized Thermal Energy Consumption	version 3.1	GS Website
34	IPCC	2006 IPCC Guidelines on National GHG Inventories	2006	IPCC
35	UNFCCC	Guideline: Sampling and surveys for CDM project activities and programmes of activities	Version 04.0	UNFCCC Website
36	UNFCCC	Standard Sampling and surveys for CDM project activities and programmes of activities	Version 09.0	UNFCCC Website
37	GS	Gold Standard for the Global Goals Safeguarding Principles & Requirements	Version 2.1	GS Website
38	PP	LIPI Stove Report_Khazanah Bahari	2010	PP
39	PP	LIPI Stove Report_Metalindo	2010	PP
40	PP	[en]_ITTO_2009	2009	PP
41	FAO	Global Forest Resources Assessment 2010	2010	FAO Website
42	IPCC	Climate Change 2014 Synthesis Report	2014	IPCC Website
43	GS	GS 1172 PDD 21-10-2013	2013	GS Website
44	PP	Letter confirmation from GS_CME changes from YRE to BKN	2023	PP
45	BIRU biogas rumah	User Manual (O&M)	2016	PP

No.	Author	Title	References to the document	Provider
46	PP	20180407 KPT December 2017	2017	PP
47	PP	BIOSLURRY APPLICATION_BIOGAS BOOK	2015	PP
48	GS	Site visit and remote audit requirements and procedures	Version 2	GS Website

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

Table 1. Remaining FAR from validation and/or previous verifications

FAR ID		Date:
Description of FAR		
NA		
Project participant response		Date:
Documentation provided by project participant		
VVB assessment		Date:

Table 2. CAR from this verification

NC/CAR id.	01	Date: 29/01/2025
NC/CAR description		
<p>The following errors have been found on the 20241119 VPA1 MR v1.0:</p> <ol style="list-style-type: none"> 1. Some results on the total rows of table 8 on BUS 2023. 2. Website of reference 27 does not work. 3. Average value of monitored parameter of fraction usage rate: $U_{p1,y}$. 4. Value applied as usage rate for the equation to calculate the cumulative number of project technology-days ($N_{p1,y}$). 5. The following cells indicated in the sources of data of: <ol style="list-style-type: none"> a. The average technology-days during which the biodigesters are operational for project scenario ($O_{p1,y}$). b. GS-03 soil condition (p.29). c. GS-10 Quantitative employment and income generation. 6. Value of Kerosene for quantity of fossil fuel consumed in project scenario ($BB_{p1,fuel}$), is not consistent with the source of data provided. 7. Drop-off rate by 1.9% represented on page 39 for GS-13 Establishment of sustainable food production area, is not consistent with 'GS-13 calculation 2023 ver' file provided by the PP. 8. The equivalent to 2.5% taken from BUS of total units in operation, for the households that sell the bio-slurry on the market (total of 355), shown on page 40 (Section E.2.) for GS-10 Quantitative employment and income generation, is not consistent with the 1.8% represented along the Monitoring Report (MR). 9. In Section E.4., the project estimate (tCO_2e) is not consistent with the ER spreadsheet VPA-1 (tab GS VER 2023) provided by the PP. 10. Values of the equation 'Actual values achieved during this monitoring period' on Section E.5. (third column of the table on page 43) are not correct. 11. Date of the second column of table 17 is not correct. 12. Reference 39 has an incorrect name of the supporting documentation. 13. Calculation of Thermal energy demand (TJ/year) ($Fuel * NCV$) of table 21 for biomass and LPG are not correct. 14. Average per household (tonne/tear) for kerosene by 0.051, does not match with the source of data indicated in reference 44. 15. The website represented in the reference 48 does not work. 		

16. The value of total VS entering the biodigester kgVS.day-1 of the dairy cow on table 30 by 10.66 is not consistent with the ER spreadsheet.
17. Values of monthly ER (tCO_{2e}) column of table 38 by 3,727 are not consistent with the ER spreadsheet for VPA-1.

Project proponent's response

Date: 21/02/2025

The errors have been corrected:

1. Results on the total rows of table 8 were corrected and are consistent with BUS 2023.
2. Website of reference 27 (now 29) was reviewed and works.
3. The average value of monitored parameter of fraction usage rate: $U_{p1,y}$ was corrected.
4. The value applied as usage rate for the equation to calculate the cumulative number of project technology-days ($N_{p1,y}$) was corrected.
5. The following source cells were corrected to indicate in the sources of data of:
 - a. The average technology-days during which the biodigesters are operational for project scenario ($O_{p1,y}$).
 - b. GS-03 soil condition (p.29).
 - c. GS-10 Quantitative employment and income generation.
6. The value for Kerosene for quantity of fossil fuel consumed in project scenario ($BB_{p1,fuel}$), was corrected to be consistent with source of data provided.
7. The calculation of GS-13 Establishment of sustainable food production area, was updated to be consistent with 'GS-13 calculation 2023 ver' and 'Drop_off_BUS2023_rev' file provided by the PP. The result of this recalculation is 305.10 hectares. It was also updated for VPA-2 MR. The updated calculation sheet '20250213 GS-13 calculation 2023_ver1' is included as supporting evidence.
8. The equivalent to 2.5% taken from BUS of total units in operation, for the households that sell the bio-slurry on the market (total of 355), shown on page 40 (Section E.2.) for GS-10 Quantitative employment and income generation, was corrected to be consistent with the 1.8% represented along the MR and 'BUS_2023_Tabulation_15072024'.
9. In Section E.4., the project estimate (tCO_{2e}) was corrected to be consistent with the ER spreadsheet VPA-1 (tab GS VER 2023).
10. Values of the equation 'Actual values achieved during this monitoring period' on Section E.5. (third column of the table on page 43) were corrected to be consistent with the ER spreadsheet VPA-1 (tab GS VER 2023).
11. Date of the second column of table 17 was corrected.
12. Reference 39 (now 42) was corrected to reflect the name of the supporting documentation.
13. Calculation of Thermal energy demand (TJ/year) (Fuel * NCV) of table 21 for biomass and LPG were corrected to be consistent with 20240705 KPT December 2023_YRE1.
14. Average per household (tonne/tear) for kerosene was corrected to match with the source of data indicated in reference 44 (now 48).
15. The website represented in the reference 48 (now 52) was changed to another website containing the same document, and a full reference was included.
16. The value of total VS entering the biodigester kgVS.day-1 of the dairy cow on table 30 was corrected to be consistent with the ER spreadsheet.
17. Values of monthly ER (tCO_{2e}) column of table 38 were corrected to be consistent with the ER spreadsheet for VPA-1.

Documentation provided by the project proponent

- 20250213 GS-13 calculation 2023_ver1

VVB's evaluation

Date: 03/03/2025

1. PP has modified the errors detected and table 8 is now correct.
2. The websites indicated in the reference (now 30) have been updated correctly.
3. Average value of fraction usage rate has been updated appropriately and it is now consistent.

4. Values of the equation to get $N_{p1,y}$ parameter are now correct.
5. All the indicated cells have been corrected appropriately.
6. Value of $BB_{p1,fuel}$ parameter has been corrected in a consistent manner with the supporting documentation.
7. Drop-off rate has been updated in a consistent manner. In addition, the calculation of GS-13 (hectares applying bio-slurry) has been reviewed and modified by the PP. The VVB has assessed the results and deems it correct.
8. Percentage of total units in operation has been corrected by the PP in a consistent manner with the rest MR.
9. Project estimate has been updated correctly in Section E.4.
10. Values indicated of the equation have been modified. **However, value for PE_y parameter is still incorrect.**
11. Indicated date of table 17 is now correct.
12. Reference name indicated has been properly modified by the PP.
13. Values and calculations of table 21 are now correct and consistent with the supporting spreadsheets referenced.
14. The average value per household for Kerosene has been corrected in an appropriate manner by the PP.
15. The reference indicated has been substituted by another one with more precise information.
16. Indicated value corrected appropriately in a consistent manner with the VPA-1 ER spreadsheet.
17. Table 38 has been modified consistently with the ER spreadsheet referenced.

As there is still one issue pending to be resolved, CAR 01 is still open.

Project proponent's response	Date: 05/03/2023
10. Values were corrected to properly reflect the ER calculations in line with ER spreadsheet. Values may not add-up due to rounding $ER=103,834.6-57,523.3-1,213.2= 45,098.1$.	
Documentation provided by the project proponent	
VVB's evaluation	Date: 03/03/2025
The pending issue has been corrected properly by the PP in the MR updated. CAR 01 is closed.	

Table 3. CL from this verification

CL ID	01	Date: 29/01/2025
CL description		
<p>Please provide evidence of the following:</p> <ol style="list-style-type: none"> 6. Office training conducted on December 26, 2023. 7. 141 total of grievances with the respective responses/mitigation. 8. Some record of the staff and their attendance at the vocational training programmes, regarding the functioning of the biodigester technology. 9. Warranties on the biodigesters and stoves maintenance and replacements. 10. During the on-site visit, the PP mentioned that IDBP collaborated with one university from Jakarta in 2019 to do workshops on stoves modifications. Please provide any evidence related on this matter 		
Project proponent's response		Date: 21/02/2025
<p>All evidences are uploaded.</p> <p>Note on no. 5. After checking the report, we noticed that the stove modification training was held in 2018 (not 2019) and collaborated with University from Jogjakarta (not Jakarta). The IDBP Report 2018 is uploaded as evidence.</p>		
Documentation provided by the project proponent		
VVB' evaluation		Date: 03/03/2025
<p>All the evidence asked by the VVB have been provided by the PP. The audit team has reviewed all the documentation and deems it correct and acceptable.</p> <p>Therefore, CL 01 is closed.</p>		

CL ID:	02	Date: 29/01/2025
CL description		
<p>Clarification of the following points of the MR VPA-1 is required:</p> <ol style="list-style-type: none"> 1. If PT. RASA has been in charge of implementing and analysis the BUS, KPT and Leakage Assessment since 2021 or 2023, due to different information reflected in the MR of VPA-1 and VPA-2. 2. If the office training conducted was on December 26, 2023 or 2024. 3. If the cluster size of the BUS 2023 (US + CMS) on the survey design summary of page 12 is 35-52 households or 45-59 as seems in the spreadsheets provided. 4. The following references are convenient: <ol style="list-style-type: none"> a. Total sample size by for the KPT (PTF) by 89 (table 6 in p.11). b. Samples of the database of table 12 (p.18). c. Values represented on table 35. 5. If a total of 329 households was reached for VPA-1, with 221 households completing the interview, how 59 households have been reported as drop-offs if the difference is greater by 108 households? 6. Reference 18 (now 20) was improved indicating the data source. 7. Complete the dates indicated on page 15 on surveyors (section C) with the corresponding years. 8. For GS-14 Time saved on page 32, in the source of data, should not be question 68, rather than 47 (Cell AE3203)? This value seems for SDG1 (previous GS-07 described) in table1 of the MR. 		

9. Where can be found the bio-slurry usage as fertilizer by 24.6% according to the BUS, shown on page 40 for GS-13.
10. If the value of kerosene on table 22 is 0.641 or 0.214, according to the ER spreadsheet VPA-1 (cell E67, tab GS VER 2023). This way, clarify if the total of table 22 is correct.
11. Where to find the value 8/46 of households using more fuel (biomass, LPG and/or kerosene) because of the neighbor having a biogas digester; It is not 4/46 (formula cell E81 of GS VER 2023 tab in the ER spreadsheet VPA-1)?
12. How calculation of Emissions from fuel switch to biogas (tCO_{2e}/yr) of table 25 is made?
13. The value of PE_{p1,CH4,y} (tCO_{2e}/year) of dairy cow on table 28. Are these values represented in the supporting documentation? References would be convenient.
14. For the applicability of leakage source 'b' of table 29, values displayed. The amount of leakage emission by 0.016 tCO_{2e} per year seems not to be consistent with the ER spreadsheet. In addition, corresponding cells shown on its references 59 and 60 are not clear.
15. In which supporting documentation can be found the values of Average B_{o,dig} (m³CH₄/kgVS) for cattle cow and beef cow in the last column of table 33. Reference would be convenient. Also, clarify if the sum of this column is 0.025 or 0.026.
16. If project emissions from bio-slurry equate 2.32 or 0.053 tCO_{2e}.

Project proponent's response

Date: 21/02/2025

Clarifications for the following points of the MR VPA-1:

1. PT.RASA has been in charge of implementing and analysis the BUS, KPT and Leakage Assessment since 2021. VPA-2 MR was corrected
2. The office training conducted was on December 26, 2023.
3. The cluster size of the BUS 2023 (US + CMS) on the survey design summary of page 12 is 35-59 as in the spreadsheets provided.
4. The following references were added:
 - a. Reference 7: Total sample size by for the KPT (PTF) by 89 (table 6 in p.11).
 - b. Reference 26: Samples of the database of table 12 (p.18).
 - c. Reference 77: Values presented on table 33.
 - d. Reference 79: Values represented on table 35.
5. Out of 329 households sampled, a total of 280 households was approached for VPA-1, with 221 households completing the interview and 59 not finishing it. 26 households have been reported as non-technical drop-offs.
6. Reference 18 can be improved indicating the data source more precisely.
7. Corresponding years of trainings conducted were added, reflected on page 15 (Section C).
8. For GS-14 Time saved on page 32, the source of data was corrected to question 47 (Cell AE3203).
9. The source of the bio-slurry usage as fertilizer is 19.6% according to the BUS, shown on page 40 for GS-13, the source of this value is BUS_2023_Tabulation_15072024 | sheet Tabulasi | cell Z4129.
10. The value of kerosene on table 22 is 0.214, it was corrected to be consistent with the ER spreadsheet VPA-1 (cell E67, tab GS VER 2023). The total of table 22 is correct.
11. 4/46 of households use more fuel (biomass, LPG and/or kerosene) because of the neighbor having a biogas digester; It was corrected to be consistent with formula cell E81 of GS VER 2023 tab in the ER spreadsheet VPA-1. Reference 49 was added to indicate the source.
12. Reference 55 was updated to include the source where the calculation of Emissions from fuel switch to biogas (tCO_{2e}/yr) of table 25 is made.
13. Reference 63 was added to indicate the cell where the calculation of table 28 was made.
14. For the applicability of leakage source 'b' of table 29, values displayed. The amount of leakage emission was corrected to be consistent with the ER spreadsheet. Corresponding cells shown on its references 59(now 64) and 60(now 65) were corrected.
15. Reference 77 was added to indicate the source of the values of Average B_{o,dig} (m³CH₄/kgVS) for cattle cow and beef cow in the last column of table 33. The sum of this column is 0.025.
16. Project emissions from bio-slurry equate 0.053 tCO_{2e}.

Documentation provided by the project proponent	
VVB's evaluation	Date: 03/03/2025
<ol style="list-style-type: none"> 1. Issue clarified by the PP. 2. PP has corrected the indicated date in all the MR for VPA-1 correctly, except for one reference on page 11 (Section C). 3. The cluster size has been corrected adequately. 4. Indicated references have been added to the MR. However, cells of reference 26 are not correct, and values of Total VS in bio-slurry kgVS.day⁻¹ and \sumDMSxMCF columns seem not to be consistent with reference 79. 5. PP has clarified the issue, as well as modified the corresponding paragraph of page 14 (Section C) of the MR. 6. Reference of table 8 improved by adding another accurate reference (n° 20) with the corresponding spreadsheet. 7. Corresponding year added as indicated. 8. PP has modified correctly the related information on GS-14 parameter in Section D.2. 9. Indicated values for GS-13 corrected adequately, and clarified to the VVB with the corresponding reference. 10. Value of kerosene in table 22 has been corrected in line with its reference, and the total sum is now consistent. 11. Indicated value corrected and referenced. 12. Emissions from fuel switch to biogas value has been updated. However, calculation does not match with the reference 55 indicated. 13. Reference (63) added adequately for table 28. 14. Content information indicated of the Appendix and reference (64), modified by the PP correctly. 15. Correct reference (77) added, and information asked clarified to the audit team. 16. Issue clarified and reference (79) added in addition. <p>CL 02 is still open.</p>	
Project proponent's response	Date: 05/03/2025
<ol style="list-style-type: none"> 2. Date of field training was corrected. 4. Cells on reference 26 and values of table 35 were corrected. 12. Emissions from fuel switch to biogas were corrected to be aligned with reference. 	
VVB's evaluation	Date: 20/03/2025
<ol style="list-style-type: none"> 2. Ok. 4. Indicated requests have been modified in correctly and in line with the supporting documentation of the project. 12. The issue has been corrected adequately by the PP. <p>Therefore, CL 02 can be closed.</p>	
CL ID:	03
	Date: 29/01/2025
CL description	
<p>After the on-site visit and interviewed 50 households during the week of January 13th – 17th, 2025, the auditing team has identified the following households with some issues/responses of the households' owners (represented the ID plant serial number as reference of each household below), that are not consistent with the data represented in the IDBP Database of the project:</p>	

1. SGP0369 responded that all their cattle were sold (two cows) and nowadays they were sharing it with their neighbors. How the program monitors the bio-slurry and fuel consumed by the HHs in this type of situations?
2. PRP0017 responded 'Nayak' as the owner's name and 2013 as the date of the biodigester installation. However, according to the IDBP Database VPA1, owner's name is 'Abdullah' and the date of installation is 2012.
3. PRP0021 responded 'M. Ilham' as owner's name and 2013 as the biodigester date of installation. However, according to the IDBP Database VPA1, owner's name is 'Haerudin' and the date of installation is 2012. In addition, clarify why this HH was not in the list of the sampling plan ('LIST USER VERIFIKASI GS 2025_update13012025') of the on-site visit; neither as a main household to interview nor as a backup.
4. Why YSP0096 was not in the list of the sampling plan ('LIST USER VERIFIKASI GS 2025_update13012025') of the on-site visit; neither as a main household to interview nor as a backup?

Project proponent's response	Date: 21/02/2025
-------------------------------------	-------------------------

1. This is likely because they just sold their cows, it is still in the database. In the next 2024 monitoring period, it will be considered as 'drop-off'. In general, when households sell their cows, they will be considered 'drop-off'.
2. Nayak is the Owner. Abdullah is the mason's name (technician who constructed the biodigester). VVB can re-check it on the database.
3. M. Ilham is the owner. Haerudin is the mason's name (technician who constructed the biodigester). VVB can re-check it on the database. PD prepared PRP0026 as back up. But then suddenly the owner was not in the place, so it was replaced by PRP0021.
4. PD has prepared YSP0095 as back up. But then suddenly the owner was not in the place, so it was replaced by YSP0096.

Documentation provided by the project proponent
--

--

VVB's evaluation	Date: 03/03/2025
-------------------------	-------------------------

1. As this issue is pending to be verified in the future, the audit team has valued to passing this CL to a FAR, where it is indicated for the next verification that these types of cases are taken into account by the VVB with respect to the database of the project and the houses that are visited during the audit.
2. Issue clarified and confirmed with the IDBP VPA1 database.
3. Issue clarified and confirmed with the IDBP VPA1 database.
4. Clarified to the auditing team.

CL 03 can be closed.

CL ID	04	Date: 29/01/2025
--------------	-----------	-------------------------

CL description

<p>After the on-site visit and interviewed 50 households (HHs) during the week of January 13th – 17th, 2025, the audit team has identified the following 11 households (ID plant serial number represented below) that were indicated to be from VPA-1, while they are represented in the supporting documentation '2024 IDBP Database VPA-2':</p> <ul style="list-style-type: none"> 12. YSP1619 13. YSP1626 14. YSP1623 15. YSP1627 16. SGP0354 17. PCP0264 18. PCP0266 19. SGP0370 20. SGP0369 21. SGP0387 22. SGP0388 	
Project proponent's response	Date: 21/02/2025
Yes, the 11 households are under VPA2.	
Documentation provided by the project proponent	
VVB's evaluation	Date: 03/03/2025
Backup households list of the VPA-1 sampling plan have been clarified by the PP. Therefore, CL 04 can be closed.	

Table 4. FAR from this verification

FAR ID		Date: 03/03/2025
FAR description		
After the on-site visit of this verification (MP), the auditing team identified the household SGP0369 (id number of the biodigester) responding that all their cattle were sold (two cows) recently, and that during the present moment they were sharing it with their neighbors. As the PP confirmed that this kind of situations are likely, being accounted as 'drop-off', VVB shall consider it for the next verification, and verify that this household is accounted as drop-off in the DDBB of the project for 2024.		
Project proponent's response		Date: DD/MM/YYYY
Documentation provided by project proponent		