AENOR Confía	**Validation report form for Design Certification Renewal of programme of activities crediting period**
BASIC INFORMATION	
Title and GS reference number of the programme of activity (PoA) and the voluntary project activity (VPA)	Indonesia Domestic Biogas Programme of Activities (IDBP) GS reference number: program (PoA): GS1172, VPA-1: GS1174
Number and duration of the crediting period (CP)	01/06/2025 – 31/05/2032, 7 years including both days
Version number of the validation report	3.1
Completion date of the validation report	07/04/2026
Version number of VPA-DD to which this report applies	2.4
Coordinating/managing entity (CME)	PT. Biru Karbon Nusantara
Host Party	Indonesia
Applied methodologies and standardized baselines	Methodology for Animal Manure Management and Biogas use for Thermal Energy Generation (version 1.1)
Estimated Selected Sustainable Development Goals (SDGs)	SDG 1 – No poverty: 60.1 billion rupiah annual average household savings SDG 2 – Zero hunger: 7,326.95 ha under improved or new soul conservation practices SDG 5 – Gender equality: 321.2 hr per household average time saving associated with cooking time and fuel collection and 2 women in the project serving in managerial/leadership/ownership role SDG 7 Affordable and clean energy: 20,252 households benefited and 139.7 GJ/year of thermal energy produced (renewable) SDG 8 – Decent Work and Economic Growth: 6 number of jobs provided SDG 13 – Climate Action: 51,393 tCO_2e per year amount of GHGs emissions avoided
Activity Requirements applied	☒ Community Services Activities ☐ Renewable Energy Activities ☐ Land Use and Forestry Activities/Risks & Capacities ☐ N/A
Product Requirements applied	☒ GHG Emissions Reduction & Sequestration ☐ Renewable Energy Label ☐ N/A
Project Cycle	☐ Regular ☒ Retroactive

Estimated amount of annual average GHG emission reductions	51,393 tCO_2e
Name and GS reference number of the DOE	AENOR CONFIA, S.A.U.
Name, position and signature of the approver of the validation report	José Luis Fuentes  Climate Change Manager

SECTION A. Executive summary

AENOR CONFIA S.A.U. (AENOR) has been contracted by Yayasan Rumah Energi (YRE) to undertake the validation for the renewal of the crediting period of the PoA and of the VPA-1 belonging to the registered GS programme titled “Indonesia Domestic Biogas Programme of Activities” (PoA and VPA-1 GS reference numbers: 1172 and 1174 respectively). The validation has been performed through a process of document review, based on the Programme of Activities design document and the Voluntary Project Activity design document (hereafter referred to a PoA-DD and VPA-DD respectively) /1-2/, submitted for validation and the subsequent revisions, followed by resolution of outstanding issues and issuance of the validation report. The PoA-DD and the VPA-DD have been assessed by the audit team in compliance with the Key Project Information, for the Programme Design Document (PoA-DD) template and guide version 2.2 on one hand, and for the VPA Design Document template and guide version 2.3 on the second hand, from Gold Standard /4//37//73-74//78/.

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 /10/:

Province	Latitude	Longitude	Number of biodigesters until 31/12/2023
Lampung	5° 27' 0.0000" S	105° 16' 0.0120" E	419
West Java*	6° 54' 53.0784" S	107° 36' 35.3160" E	1,447
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	4,330
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	1,408
South Sulawesi**	5° 8' 51.5940" S	119° 25' 57.8352" E	1,930

*Provinces Banten and Sumatera Selatan are included in the West Java province
**Province Kalimantan Tengah, Gorontalo, Central Sulawesi and Southeast Sulawesi are included in South Sulawesi province

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 for programme of activities i.e., 15 MW or 45 MW_{th} for the renewable energy component and an emissions cap of 60,000 tCO_2e for the methane avoidance component as shown in the table below /75-76/:

$\mathbf{Th_{cap}} = \frac{\mathbf{E}}{\mathbf{t}}$ $\quad where \quad \mathbf{E} = \eta * H_b * V_b$		
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 /38/
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	Calculated /6/
E = Energy available from the biogas system	18.87 MJ/day	Calculated /6/

E_{th} =	5.25 kWh/day	1 MJ = 0.2778 kWh
Th_{cap} =	1.91 kW_{th}	Given a 2.74 hour/day usage
Total capacity	38.742 MW_{th}	Given 20,252 units installed /10/

The validation for the renewable crediting period scope is defined as an independent and objective review of the latest version of the registered PoA-DD and the VPA-DD, including any other relevant documentation. The information in these documents is reviewed against the following documents:

- GS4GG Principle & Requirements version 2.1 /19/
- GS4GG Validation & Verification Standard version 2.0 /21/

Regarding the suppressed demand, according to the GS4GG "Application of suppressed demand, project type and applicable scale threshold (RU 2020 PR-GHG V1.2) /83/", Small Scale projects and VPAs, solely comprising distributed units and applying the unit level threshold are not required to demonstrate compliance with the appliable Small Scale thresholds at the aggregate level of the project and VPA, when the unit level threshold embrace capacity up to 1,500 kW that employ distributed renewable energy generation technology (Type 1) or that achieve energy savings at a scale of no more than 600 MWh per year (Type II) or that achieve emission reductions at a scale of no more than 600 tCO2 per year (TYPE III) for household/community/SME applications.

As the project units amount to a maximum output of 1.91 kWth, which is below the established threshold of 450 kWth per unit, it can be considered not applicable for suppressed demand scenario due to its low impact.

Nonetheless, there are still conditions that justify the suppressed demand due to the reference scenario of the project has not suffered significant changes since its implementation. The baseline scenario is not business-as-usual and reflects a denial of basic energy/service needs due to poverty and lack of access. In addition to the experience of AENOR in many verifications, on-site visits and interviews with the project, "Pathway Towards Economic Security: Indonesia Poverty Assessment" from 2023 by the World Bank /48/ and "Biogas diffusion among small scale farmers in Indonesia: An application of duration analysis" from 2019 /84/ clearly reflect the poor economic situation that suffers the rural population of Indonesia, where the average households have a decrease in expenditure on basic service such cooking, lighting and drinking.

In addition, according to recent studies, such as "The impact of a household biogas programme on energy use and expenditure in East Java" /88/, although the LPG consumption can decline in Indonesia due to biogas projects (by about 6-7 Kg/month), the benefits form biogas projects are much greater and they translate into significant household energy expenditures decreased (by about 45% for new users as compared to 2011 expenditures, in Java, after adopting biogas projects). Additionally, there is a reduction in the number of bundles of firewood used, but this effect is not statistically significant. This is due to households tend to gather firewood from publicly accessible sources as opposed to purchasing firewood.

The report is based on the assessment of the project PoA-DD /2,/ and the VPA-DD /1/, undertaken through stakeholder consultations, application of standard auditing techniques including but not limited to desk review, follow up actions (e.g., electronic (telephone or e-mail) interviews) and also the review of the applicable approved methodologies and relevant tools, guidance and other GS requirements. This report validates the requirements of Gold Standard for the renewal of crediting period.

Scope of the Validation

The scope of the validation for the renewable crediting period is defined as an independent and objective review of the PoA-DD /2/, VPA-DD /1/, the baseline scenario, estimated GHG emission reductions, demonstration of ongoing financial need, monitoring plan and other relevant documents. The information in these documents is reviewed against Gold Standard rules and associated interpretations. AENOR, based on the GS Validation Verification Standard v2.0 /21/, has used a risk-based approach in the validation, focusing on the identification of significant risks for project

implementation and the generation of the emission reductions (ERs). Whereas the crediting period of the PoA started on 01/06/2025 with a total length of 5 years. Whereas the crediting period of the VPA started on the same date 01/06/2025, with a total length of 7 years. The latter is aligned with p.3.1.4-d of the GS4GG Transition Requirements v2 /79/.

The validation is not meant to provide any consultancy services to the Client. However, this report stated requests for clarifications and/or corrective actions providing input for improvement of the PoA-DD and the project VPA-DD /1-2/ (see Appendix 4 of this report), performed based on GS criteria as well as criteria given to provide for consistent programme operations, monitoring and reporting.

Validation Process

As previously commented, the project validation assessment for renewal of the crediting periods aims to be a risk-based approach and is based on the Requirements for Validation/Verification Bodies (VVBs) version 3.0 /66/ and Validation/Verification Standard version 2.0 /21/, which aims to harmonise the approach and quality of all such assessments.

The validation for the renewal of the crediting periods was performed in the manner of an audit, where a desk review of the PoA-DD and the project VPA-DD was undertaken against the latest version of the approved GS methodology, tools and other relevant criteria applying to the project.

As a final step of the validation, the validation report for the renewable crediting period 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, independent of the team that carried out the validation of the project activity.

In order to ensure transparency, a validation protocol from AENOR was customised for the project, according to Specific Instruction 02-IE-0402. The protocol shows, in a transparent manner, criteria (requirements), means of validation and the results derived from validating the identified criteria.

The validation protocol serves the following purposes:

- It organises, provides details and clarifies the requirements a GS Programme of Activities is expected to meet.
- It ensures a transparent validation process where the validator will document how a particular requirement has been validated and the result of the validation.

The PoA and the VPA Design Documents submitted by the Project Proponent (PP) were reviewed against the approved methodology and against GS4GG and other relevant criteria. Additional background documents related to the project design, rules and regulations issued by the government and baseline were also validated.

The project assessment is based on the Methodology for Animal Manure Management and Biogas use for Thermal Energy Generation - Version 1.1 (January 2023), and the validation was carried out in accordance with the applied methodology. It was confirmed that the project during the current validation is in accordance with the applicability criteria of the methodology /5/.

In the following section B below, information about the team is provided. Auditors are experienced in GS with many years auditing GHG projects in multiple programs such as CDM, GS, VCS…. No risks were identified related to the audit techniques and no FARs were raised. During the audit process AENOR did not perform an on-site visit since is not required by the GS requirements but instead performed desk reviews, interviews and cross-checks of evidence and triangulations, etc to assess the different requirements from GS. The different techniques are detailed throughout the validation report. These techniques were sufficient to close the assessment and the findings raised.

On the other hand, the project participant (PP) was requested to address all validation findings and finally provided the validation team with sufficient evidence to determine that the applicable GS4GG requirements have been met. The project proponent has responded to these findings by modifying the GS4GG VPA-DD and providing adequate additional explanations and evidence. Therefore,

AENOR confirms that all the findings have been “closed out” before submitting the request for registration to the GS board.

All Corrective Action Requests (CARs), Clarification Actions (CLs) and Forward Action Request (FARs) have been checked by the validation team and have been adequately resolved. All the supporting evidence and references are represented in Appendix 3 of this report and all validation findings are documented in more detail in Appendix 4.

In AENOR’s opinion, the project of activity meets all relevant GS4GG criteria, and the relevant host country criteria for the renewal of the crediting period. Hence AENOR requests the renewal of the crediting period of the VPA.

SECTION B. Validation team, technical reviewer and approver

B.1. Validation 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	Validation findings
1.	Team Leader	IR	Gonzales Toledo	Richard Daniel	AENOR	Yes	No	No	Yes
2.	Validator in trainee	IR	García Martínez	Irene	AENOR	Yes	No	No	Yes

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

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	Fuentes Pérez	José Luis	AENOR
2.	Approver	IR	Fuentes Pérez	José Luis	AENOR

SECTION C. Means of validation

C.1. Desk/document review

The VPA Design Document submitted by the PP was reviewed against the approved GS methodology and against GS requirements and other relevant criteria.

The following documents were reviewed as part of the validation:

- Project documentation: the GS4GG VPA-DD Version 2.3 (“20250926 VPA 1 - CP Renewal_PDD_v2.4”), the emission reductions spreadsheet and other supporting documentation /1//6/
- The Gold Standard for the Global Goals “Template for Key Project Information & Programme Design Document (POA-DD)” /78/
- The Gold Standard for the Global Goals “Template for Key Project Information & VPA Design Document (VPA-DD)” /4/
- The Gold Standard Methodology for Animal Manure Management and Biogas use for

Thermal Energy Generation (version 1.1) /5/
- The Gold Standard for the Global Goals "Principles and Requirements" Version 2.1 /19/
- The Gold Standard for the Global Goals "Validation & Verification Standard" Version 2.0 /21/
- The Gold Standard Site Visit and Remote Audit Requirements and Procedures Version 2.0 /58/
- Gold Standard for the Global Goals Safeguarding Principles & Requirements Version 2.1 /27/
- The Gold Standard for the Global Goals, Community Services Activities Requirements Version 1.2. /20/
- The Gold Standard for the Global Goals Stakeholder Consultation and Engagement Requirements Version 2.1 /60/

Additional background documents related to the project design, rules and regulations issued by the government and baseline were also validated.

To address the corrective actions and clarification requests that arose from the desk review, the consultants revised the initial VPA design document submitted and developed to the final VPA-DD. A complete list of all documents reviewed is attached in Appendix 3 of this report.

C.2. On-site inspection

The on-site visit was not performed complying with the Gold Standard Validation & Verification Standard v2 Section 6.3.3 and p.6.6.2 of the GS Site visit and remote audit requirements and procedures, which specify that the site visit is not mandatory. Although no on-site visit has taken place for this validation process, a recent on-site visit was conducted during the previous verification for VPA-1 by AENOR in January 2025, where 17 households and stakeholders were interviewed /63/.

In addition, personal interviews in Indonesia have taken place with YRE workers and local representatives detailed in section C.3 below. On the other hand, a proper assessment was carried out including desk review, exchange of mails, remote meetings (with phone, teams, zoom, skype…) and cross checks between the VPA-DD and supporting documentation provided by the PP.

C.3. Interviews

No.	Interviewee			Date	Location	Team member
	Last name	First name	Affiliation			
1.	Batur Romzini	Chabi (Bibah)	Yayasan Rumah Energi (YRE)	25/04/2025 - 14/08/2025	Remote	Richard Daniel Gonzales Toledo
2.	Bakhtary	Haseeb	ClimateFocus (Lead Consultant)			
3.	Nannuba	Hilma	Biru Karbon Nusantara			
4.	Krisna	Wijaya	YRE			
5.	Sepulveda	Laura Carolina	ClimateFocus (Consultant)			

Additionally, the audit team interviewed during the latest verification of VPA-1 in January 2025, a sample of the biodigester's 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 in the previous verification provided insight on the programme and allowed to validate and verify the information stated on the VPA-DD. 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 /7//10//12//15//41//42//50//51//63/.

C.4. Sampling approach

A project specific Sampling Plan was developed to guide the validation auditing process to ensure efficiency and effectiveness. The purpose of the Sampling Plan was to present a risk assessment for determining the nature and extent of validation procedures necessary to ensure the risk of auditing error was reduced to a reasonable level. The sampling Plan methodology was derived from all items in the verification process. Specifically, the sampling plan utilized the UNFCCC, GS guidance documents and ISO 14064-3:2019 /28-29/.

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), corrective action requests (CAR) and one observation (OBS) 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 CLs and CARs were fully closed. Specifically, 3 CLs and 2 CARs.

Area of validation findings	No. of CL	No. of CAR	No. of FAR
Compliance with PoA-DD and VPA-DD form	---	CAR 01	---
Application and selection of methodologies and standardized baselines	---	---	---
Validity of original baseline or its update	CL 02 & CL 03	---	---
Demonstration of eligibility of the VPAs	---	---	---
Estimated emission reductions or net anthropogenic removals	---	---	---
Validity of monitoring plan	CL 01	---	---
Crediting period	---	---	---
CME and project participants	---	---	---
Post-registration changes	---	---	---
Additionality	---	---	---
Others (please specify): SDGs & Safeguarding Principles that will be monitored	---	CAR 02	---
Total	3	2	0

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.

C.5.1. Forward Action Requests

No FARs have been raised during the validation process.

SECTION D. Validation findings

D.1. Compliance with POA-DD and VPA-DD forms

Means of validation	All the information included in the last version of the PoA-DD and VPA-DD /1-2/ was checked against the technical documentation submitted by the project developer and during the interviews. The validation team has checked that the PoA-DD and the VPA-DD were completed using the valid version of the applicable templates /4//78/, and that all sections follow the guidelines provided in the template guide /37//73/.
Findings	CAR 1 was raised and closed due to diverse aspects contained incomplete, inconsistent and incorrect information. Appendix 4 summarizes the findings found during the validation process and how they were closed.
Conclusion	AENOR states that the description of the PoA and correspondent VPA as contained in the PoA-DD and VPA-DD sufficiently covers all relevant elements, is accurate and provides the reader with a clear understanding of the nature of the PoA and correspondent VPA.

D.2. Application and selection of methodologies and standardized baselines

Means of validation

Applicability of the selected methodology was confirmed against the interviews with the PP, and technical documentation provided by the CME during the validation process.

The selected methodology for the VPA is the GS Methodology for Animal Manure Management and Biogas use for Thermal Energy Generation (version 1.1). The final version of the PoA-DD and VPA-DD identifies, in section B.2, the applicability conditions of the approved methodology and describes how the VPA fulfils the conditions.

The assessment of the relevant information contained in the PoA-DD and VPA-DD against each applicability condition is described below:

No.	Methodology Requirement	VVB Assessment
A.	This methodology applies only to the fraction of the manure, which would decay anaerobically in the absence of the project activity established by a survey.	The VVB has checked that fraction of manure would decay anaerobically in the absence of the project through surveys that are constantly worked by the PP /6-7//14/.
B.	Where annual emission reduction for methane recovery component is higher than five tonnes of CO_2eq per biodigester the AWMS method 2 shall be applied.	The annual emission reduction for the methane recovery component of the project is lower than 5 tonnes of CO_2e per biodigester. This way, the project applies AWMS method 1 /6/.

	C.	The category is limited to measures at individual households, small farms (e.g., installation of a domestic biogas digester) or livestock farms or institutional settings.	The validating team has ensured that the domestic biodigesters are solely installed in individual households /18//43-44/.	
	D.	The digestate must be handled aerobically. In soil application of the final digestate, proper conditions and procedures (resulting in negligible methane emissions) must be ensured.	The digestate is a fertiliser that can either be applied directly to crops or composted with other organic material and will therefore be handled aerobically.	
	E.	The biogas captured from the biodigesters is utilized (e.g., combusted or burnt for thermal applications).	The audit team has verified through supporting documentation provided by the PP and diverse on-site visits for previous verification process, that households use biogas as cooking fuel /5//7//14/.	

	F.	The activity is implemented by a project developer and can include additional project participants listed in Appendix 2 of the VPA-DD template. The individual households may be represented collectively by community organizations, etc., but do not individually act as project participants.	PP has proofed that PT. Biru Karbon Nusantara (BKN) is the project developer, YRE is the implementer of the project and the individual households do not act as project participants /18//43-44/.
	G.	The developer must design incentive mechanism(s), which should be effective as fast as possible, for the displacing the use of inefficient baseline stoves or cooking practices by the project cooking devices for daily usage and describe the incentive mechanism(s) in the PDD/VPA-DD at the time of validation.	Carbon finance from the program help households to have biodigesters. Every biodigester households received a subsidy (25 – 30%) from the program. The households also receive regular repairing services free of costs /36//41//47/.

	H.	To avoid double counting or double claiming, the project developer must: a) clearly communicate its ownership rights and intention of claiming the emission reductions resulting from the project activity to the following parties by contract or clear written assertions in the transaction paperwork: all other project participants; project technology manufacturers; and retailers of the project technology; and b) inform and notify the end users that they cannot claim emission reductions from the project, and c) exclude from the project activity, any biodigester and cookstoves that are included in any other voluntary market or CDM or Article 6 based mechanisms project activity/PoA and strive not to displace the cooking devices of another CDM or voluntary project/PoA. See data and parameters not	The VVB attests that PT. BKN has agreements with each household defining the rights of beneficiaries including PT. BKN's ownership rights and intention of claiming the emission reduction from the digesters. The agreements also state that users cannot claim emission reductions from the VPA /18//43-44/. The VPA does not include any biodigester that Is registered under any other voluntary market or CDM or Article 6 based mechanisms. Additionally to supporting documentation provided by the PD, the VVB has ensured that the project is not registered in the following GHG schemes among others: - Ecoregistry: https://www.ecoregistry.io/pro-jects-list/cercarbono-co2 and https://www.ecoregistry.io/over-lapping - CSA GHG CleanProjects: https://www.csaregistries.ca/GHG_VR_Listing/CleanPro-jectProjects - COLCX: https://colcx.com/Iniciativas?IdVista=1 - Global Carbon Council (GCC): https://projects.globalcarboncouncil.com/pages/submitted_projects - Bio-carbon Registry platforms: https://globalcarbontrace.io/projects?project_id=&project_name=&hol-der=&sector=&projectType=&objective=&status=&country= - Carbon Standard (VCS-Verra): https://registry.verra.org/app/search/VCS/All%20Projects - CDM: https://cdm.unfccc.int/Projects/projsearch.html

		monitored, Avoidance of double counting or double claiming with other mitigation actions, for details on this demonstration.	
	I.	The project shall not undermine or conflict with any national, sub-national or local regulations or guidance for animal waste management, thermal energy supply or fuel supply or use. The project shall document the national, regional and local regulatory framework for provision of animal waste management and thermal energy services of the type the project provides in the project boundary (parameter BGTA 3).	As described in section F.7. of this VR, the audit team has ensured that the project is in line with all applicable regulations for animal waste management, thermal energy supply or fuel supply or use.

J.	If the expected or remaining technical life of project technology (parameter BGTA 5) is shorter than the crediting period, the project developer shall describe measures to ensure that end users are provided or can purchase replacement technology of comparable service and quality level at the end of the technical life, by either replacing with comparable or better technology, or retrofitting essential parts with performance guarantee.	The technical life of the project technology is approximately 22 years, which exceeds the crediting period of the project.

The VPA-1, as well as VPA-2, only applies the GS Methodology for animal manure management and biogas use for thermal energy generation, Version 1.1. As they state: “The VPA applies the “Methodology for Animal Manure Management and Biogas use for Thermal Energy Generation (version 1.1)”. This methodology applies to the fraction of the manure, which would decay anaerobically in the absence of the project activity and reduced fuel use as established by a survey. This methodology replaces the application of the “Technologies and Practices to Displace Decentralised Thermal Energy Consumption (TPDDTEC) v4” methodology for biogas generation and application for thermal energy project activities, originally adopted under the IDBP PoA”.

However, as the PoA is still contemplating the possibility of application of the TPDDTEC methodology /86/ in VPAs, the assessment of its applicability conditions has been done as follows.

No.	Methodology Requirement	VVB Assessment
A.	Project shall choose a technology design that has predictable performance in that it is proven to be efficient and	As with the latest validations and verifications of the project, technology is composed of efficient biodigesters (approx. 50%). 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

		durable under field conditions; for cookstoves, the rated thermal efficiency shall be at least 20% (see Parameters ICS 1).	been used to be conservative /30-31/.
	B.	The technology shall have continuous useful energy output of less than 150kW per unit, where "continuous useful energy output" is defined above (see Parameter ICS 2).	The largest biodigester type implemented in this PoA, the 100 m^3 unit, is estimated to produce up to 30 m^3 of biogas per day. This amounts the maximum thermal capacity for the maximum size biodigester distributed by the project, which is 31.94 kW. See equation 1 reflected in the PoA-DD /2/.
	C.	The project activity is implemented by a project developer and can include additional project participants listed in Appendix 2 of the PDD template. The individual households and institutions may be represented collectively by community organizations, etc., but do not individually act as project participants.	The project is implemented in individual households by PT. BKN. PT as the CME. BKN has agreements with each household defining the rights of beneficiaries, including PT. BKN's ownership rights and the intention of claiming the emission reduction from the digesters /18//43-44/.
	D.	The project developer must design incentive mechanism(s), which should be effective as fast as possible, for the elimination of inefficient baseline	The biogas in the project replaces fuel wood and fossil fuels used traditionally. The digestate acts as an incentive for the continuous use of biodigesters, it is a fertilizer that can be directly applied to soil /7//10/.

			stoves that are replaced by the project cooking devices and describe the incentive mechanism(s) in the PDD/VPA-DD at the time of validation.	
		E.	To avoid double counting or double claiming, the project developer must: i. clearly communicate its ownership rights and intention of claiming the emission reductions resulting from the project activity to the following parties by contract or clear written assertions in the transaction paperwork: all other project participants; project technology manufacturers; and retailers of the project technology or the renewable fuel in use; and ii. inform and notify the end users that they cannot claim emission reductions from the project, and iii. exclude from the project activity, cooking devices included in any other voluntary market or CDM project activity/PoA,	PT. BKN has agreements with each household defining the rights of beneficiaries including PT. BKN's ownership rights and intention of claiming the emission reduction from the digesters. In addition, the agreements state that users cannot claim emission reductions from the VPA /18//43-44/. The PoA does not include any biodigester that is registered under any other voluntary market or CDM or Article 6 based mechanisms. Additionally to supporting documentation provided by the PD, the VVB has ensured that the project is not registered in the following GHG schemes among others: - Ecoregistry: https://www.ecoregistry.io/pro-jects-list/cercarbono-co2 and https://www.ecoregistry.io/over-lapping - CSA GHG CleanProjects: https://www.csaregistries.ca/GHG_VR_Listing/CleanPro-jectProjects - COLCX: https://colcx.com/Iniciativas?IdVista=1 - Global Carbon Council (GCC): https://projects.globalcarboncouncil.com/pages/submitted_projects - Bio-carbon Registry platforms: https://globalcarbontrace.io/projects?project_id=&project_name=&hol-der=&sector=&projectType=&objective=&status=&country= - Carbon Standard (VCS-Verra): https://registry.verra.org/app/search/VCS/All%20Projects - CDM: https://cdm.unfccc.int/Projects/projsearch.html

		and strive not to displace the cooking devices of another CDM or voluntary project/PoA. See data and parameters not monitored, Avoidance of double counting or double claiming with other mitigation actions, for details on this demonstration.	
	F.	Project activities making use of solid fossil fuel in the project scenario or other improved fossil fuel cookstoves meeting certain conditions described in the footnote to Table 1 (e.g. switch from three-stone fire biomass stoves to LPG stoves) may only claim emission reductions for energy efficiency improvement aspect and shall assume the same baseline and project fuel for emission reduction calculations.	The project technology is composed of biodigesters, not cookstoves.
	G.	Project activities making use of a new solid biomass feedstock in the project situation (e.g. switch to green charcoal or renewable biomass	The project activity is focused on biogas.

		briquettes) must comply with relevant specific requirements for biomass related project activities, as defined in the latest version of the Community Services Activity Requirements. The specific requirements apply to both plantations established for the project activity and/or existing plantations that will supply biomass feedstock.	
	H.	Adequate evidence is supplied to demonstrate that indoor air pollution (IAP) levels are not worsened compared to the baseline, and greenhouse gases emitted by the project fuel/stove combination are estimated with adequate precision[1]. Furthermore, for projects where cooking will move from outdoor to indoor or where the project technology reduces ventilation (for example, changing from a stove with chimney to improved	IDBP employs biogas and the audit team has not found risks or potential adverse impact on health and safety in the project activity /7//10/.

[1] The project developer must provide protocols for comparative field tests, which credibly reflect (to similar level of precision as required in this methodology otherwise) the baseline and project scenarios in respect of IAP and GHG levels.

			stove with no chimney), indoor air pollution (IAP) levels shall not worsen in the project compared to the baseline, including PM 2.5 and carbon monoxide (CO) emissions. This may be demonstrated before project Design Certification or during project operation using the certification resulting from of a manufacturer's test, report of field testing of the technology's PM 2.5 and carbon monoxide (CO) emissions, report of lab testing of the technology, or results of modelling of the technology's operation under field conditions. If none of these are available, reference from published literature or report by independent agencies may be used as evidence, provided it is not more than 5 years old.	
Findings	No findings were found regarding this issue.			
Conclusion	AENOR confirms the applicability conditions of the selected methodology to the VPA 1 and that it was correctly applied with respect to VPA boundary; baseline identification; formulae used to determine emission reductions and monitoring methodology. Therefore, AENOR validation team confirms that the application of the methodology is transparent and conservative, and that the chosen baseline and monitoring			

	methodology Gold Standard Methodology for Animal Manure Management and Biogas use for Thermal Energy Generation, version 1.1, is applicable to the VPA.

D.3. Validity of original baseline or its update

Means of validation	The VVB assessed the validity of the original baseline and confirms that it remains the same since the previous VPA-DD in 2018 and it is consistent with the PoA-DD. It is composed by three components covered by the methodology "Methodology for Animal Manure Management and Biogas Use for Thermal Energy Generation (version 1.1)" and include the following /61/: i. Consumption of non-renewable biomass for cooking. Consumption of firewood and charcoal as a source of thermal energy for cooking purposes is high in Indonesia. The usage of NRB (including charcoal) contributes to deforestation and forest degradation and results in emission of GHGs. The applicable methodology states that the baseline scenario is, in the absence of the project activity, the use of NRB meeting similar thermal energy demands. ii. Consumption of fossil fuel for cooking. Dependency on fossil fuels as a source of thermal energy for cooking purposes, especially kerosene and LPG, is also significant in Indonesia. The combustion of fossil fuels for cooking results in emission of GHGs. The applicable methodology states that the baseline scenario is, in the absence of the project activity, the use of fossil fuels meeting similar thermal energy demands. iii. Methane emissions from manure handling. The baseline scenario is the situation where, in the absence of the project activity, organic matter is left to decay anaerobically within the project boundary and methane is emitted to the atmosphere. The amount of methane that is emitted under this scenario is contingent upon the baseline manure management practice, which can include storing manure in anaerobic lagoons, deep pits, liquid storage, deep bedding, or other practices outlined in the "2006 IPCC Guidelines for National Greenhouse Gas Inventories". The applicable methodology establishes that baseline emissions are calculated by using the amount of the waste that would decay anaerobically in the absence of the project activity, with the most recent IPCC Tier 1 or 2 approaches /5/. In conclusion, it is considered by AENOR that the project description elements described in the VPA are accurate, complete, and provide an understanding of the nature of the project. Although the project is likely to achieve estimated GHG emission reduction or removals, actual results (ex-ante) may vary since the estimates are based on assumptions that are subject to change. Therefore, the baseline is still valid, and the economic conditions in the region remains to be the same according to information of the Government of Indonesia.
Findings	CL 2 and 3 were raised and closed due to further clarifications and diverse aspects that contained incomplete, inconsistent and/or incorrect information. Appendix 4 summarizes the findings found during the validation process and how they were closed.
Conclusion	The baseline, as defined in the previous crediting period is still valid at the renewal of crediting period. It is important to remark that the project activity is completely implemented in the region and complies with its regulatory framework.

D.4. Demonstration of eligibility of the VPAs

Means of validation	The audit team reviewed the eligibility conditions included in section B.3. of the PoA, and how the VPA-DD fulfils them in the table 2 of the section A.1.1.

NO.	ELIGIBILITY CRITERION	DESCRIPTION/ REQUIRED CONDITION	MEANS OF VERIFICATION AND SUPPORTING EVIDENCE FOR INCLUSION
1	Types of Projects: Eligible projects shall include physical action/implementation on the ground. Pre-identified eligible project types are identified in the Eligibility Principles and Requirements section.	Project is pre-identified as eligible by being referenced in Gold Standard Activity Requirements. According to the activity requirements, paragraph 3.1.1: "Methane recovery project activities shall be eligible for emission reductions from both methane avoidance (including from the flared biogas fraction) and non-renewable fuel substitution as long as evidence is provided on time for validation to demonstrate that the system was designed in a way to at least make use of some of the biogas recovered for the delivery of energy services (e.g. electricity, heat)"	The VPA consists of physical action through the installation of the biodigesters. Verifiable evidence: IDBP Database /10/. See section A.1 of the VPA-DD /1/.
2	Location of Project: Projects may be located in any part of the world	All biogas systems listed in a VPA are installed within the geographical boundaries of Indonesia. Each biodigester in a VPA has a unique serial number that is recorded in the User's Manual and/or engraved or permanently attached as a nameplate which confirms the location of the biodigester. The serial numbers are listed in the IDBP database.	The VPA is developed in Indonesia. See section A.2 of the VPA-DD. This can be verified in the supporting documentation provided by the PP, such as the following /10//34//43-44/: • Completion Report; • Household Agreement; • IDBP Database; or • User's Manual.
3	Project Area, Project Boundary and Scale: The Project Area and Project Boundary shall be defined. Projects may be developed at any scale although certain rules, requirements and limitations may apply under specific Activity Requirements, Impact Quantification Methodologies and Products Requirements. In order to avoid double counting	All biogas systems listed in a VPA are installed within the geographical boundaries of Indonesia. The biodigesters are uniquely identified and defined in an unambiguous manner by providing the serial number of the systems installed. The serial numbers are listed in the IDBP database. It avoids double counting. Participating users must confirm that they are not taking part in other registered PoAs through signing of a Household Agreement for each biodigester. VPAs must be registered in the National Registration	The project area, boundary, and scale are defined and shown on table 5, section A.4, and figure 3 of the VPA-DD. Verifiable evidence such as: • IDBP Database; • Completion Report; or • Household Agreement

	the Project shall not be included in any other voluntary or compliance standards programme unless approved by Gold Standard (for example through dual certification). Also, if the Project Area overlaps with that of another Gold Standard or other voluntary or compliance standard programme of a similar nature, the project shall demonstrate that there is no double counting of impacts at design and performance certification (for example use of similar technology or practices through which the potential arises for double counting or misestimation of impacts amongst projects)	System of Indonesia (SRN) as per Presidential Regulation 98/2021. IDBP has already registered in the Gold Standard, thus registration in the SRN is through mutual recognition process with corresponding adjustment to prevent double counting of impacts. Double counting has been included as part of the monitoring plan (see B.7.1).	
4	<u>Host Country Requirements:</u> Projects shall be in compliance with applicable Host Country's legal, environmental, ecological and social regulations.	All VPAs under the IDBP shall comply with: • Indonesian Law 6/2023 regarding environmental management • Regulation of the Minister of Agriculture of Indonesia No. 1011/Permentan/OT.140/ 7/2014 that regulates waste processing units for farmers to produce biogas and organic fertilizer. • Regulation of the Minister of Energy and Mineral Resources (MEMR) of Indonesia No. 36/2018 which regulates the design, capacity, and construction of household-scale biodigester. • Presidential Decree No. 98/2021 regarding climate change mitigation and actions project registration. • Regulation of the Minister of Environment and	The VPA complies with all the listed regulations. See section B.6.2 of the VPA-DD.

			Forestry (MoEF) of Indonesia No. 21/2022 concerning the implementation of carbon economic value through carbon trading activities.	
5	Contact Details: As part of the Project Documentation the Project Developer shall provide (i) name and (ii) contact details of all Project Participants; AND in case of an organisation (iii) the legal registration details and (iv) documentation by the governing jurisdiction that proves that the entity is in good standing (defined as being a legal or other appropriate entity registered in or allowed to operate within the required jurisdiction and with no evidence of insolvency or legal/criminal notices placed against it or any of its Directors). Gold Standard retains the right (at its own discretion) to refuse use of the Standard where reputational concerns are highlighted	Contacts of each VPA Project Developer will be included in each VPA-DD.	The VPA documentation includes contact details. Also, in the PoA-DD /2/.
6	Legal Ownership: Full and uncontested legal ownership of any Products that are generated under Gold Standard Certification, (for example carbon credits) shall be demonstrated. Where such ownership is transferred from	The individuals responsible for the biodigesters are individual users of the biogas equipment. Each biodigester user as IDBP's beneficiary agrees by a 'Household Agreement' to transfer the ownership title of the generated emission reductions to the project developer, which is PT. Biru Karbon Nusantara. Each biodigester user will be asked to read and sign a contract stating that they	The VPA obtained legal ownership of the emissions through the household agreement. Section B.6.2. of the VPA-DD.

		project beneficiaries this must be demonstrated transparently and with full, prior and informed consent (FPIC). Note that for certain Project types there is a requirement for full and uncontested legal land title/tenure to be demonstrated. These are contained within specific Activity or Product Requirements. All projects shall immediately report to Gold Standard any land title/tenure disputes arising.	ask a construction partner to build them biodigester in compliance with the IDBP technology design, both biodigester user and the construction partner agree to transfer the ownership rights of the emission reductions generated by the biodigester technology to PT. Biru Karbon Nusantara, as well as allow PT. Biru Karbon Nusantara to act on their behalf in receiving emission reduction rights and the carbon fund generated. Copies of these signed contracts will be kept by the project developer. Hence, the project developer is the sole legal owner of the carbon rights.	
	7	<u>Other Rights:</u> As well as legal title and ownership, the Project Developer shall also demonstrate where required uncontested legal rights and/or permissions concerning changes in use of other resources required to service the Project (for example, access rights, water rights etc.). Any known disputes or contested rights must be declared immediately to Gold Standard by the Project Developer and resolved prior to further project implementation in affected areas.	Not Applicable.	Not Applicable.
Findings	No findings were found regarding this issue.			
Conclusion	The VPA fulfils the requirements included in the conditions of the PoA.			

D.5. Estimated emission reductions or net anthropogenic removals

Means of validation	The approach to accounting for baseline emissions from AWMS follows method 1 or IPCC Tier 1 approach. It is applicable to measures at individual households, small farms (e.g., installation of a domestic biogas digester) or livestock farms and when the digestate is handled aerobically and the biogas captured from the biodigesters is utilized (e.g., combusted or burnt for thermal applications). Baseline emissions per production system are determined as follows: $$BE_{AWMS,y} = N_{b,p,y} \div 365 \times GWP_{CH4} \times UF_b \times U_{p,y} \times \sum_{j,LT} \left(N_{LT,y} \times VS_{LT,y} \times MS\%_{Bl,j} \times EF_{LT,y}\right) \div 1000 \quad (4)$$ Where: $BE_{AWMS,y}$ = Baseline emissions in year *y* (tCO_2e) $N_{b,p,y}$ = Number of project technology-days included in the project database for each project scenario in year y GWP_{CH4} = Global Warming Potential (GWP) of CH applicable to the crediting period. The value of methane applied is 28 according to the AR5 IPCC /33/ UF_b = Model correction factor to account for model uncertainties (0.89)[2] $U_{p,y}$ = Usage rate for technologies in project scenario p in year y (fraction). For baseline emission calculation at Design Certification, the ex-ante Up,y shall be estimated. *LT* = Index for all types of livestock *j* = Index for animal waste management system $N_{LT,y}$ = Annual average number of animals of type *LT* in year *y* (numbers) $VS_{LT,y}$ = Volatile solids production/excretion per animal of livestock *LT* in year *y* on a dry matter weight basis, kg-dm/animal/year $MS\%_{Bl,j}$ = Fraction of animal manure handled in baseline animal manure management system *j*. (%). Default IPCC values applied or conduct surveys to asses the animal manure management practices in the baseline. $EF_{LT,y}$ = Emission factor for direct CH emissions by livestock *LT*, in manure management system j. The approach to accounting for baseline emissions from thermal application follows method 1 or IPCC Tier 1 approach. The baseline scenario for VPA-1 is defined by the baseline fuel consumption patterns in a household population that is targeted for adoption of the biodigester technology. The following formula calculates the baseline emissions per household: $$BE_{TA,y} = \sum_{b,p} \left(N_{b,py} \times U_{p,y} \times \left(f_{NRB,i,y} \times SE_{b,y,CO2} + SE_{b,y,non-CO2}\right)\right) \quad (5)$$

[2] FCCC/SBSTA/2003/10/Add.2, page 25: https://unfccc.int/resource/docs/2003/sbsta/10a02.pdf

Where:

$BE_{TA,y}$ = Baseline emissions for total project activity in year y (tCO_2e/yr)

$\sum_{b,p}$ = Sum over all relevant baseline b/project p pairs

$N_{b,py}$ = Number of project technology-days included in the project database for each project scenario in year y. The start date is the day a plant start producing biogas. A default of 2 weeks may be use for the period from installation date and start date.

$U_{p,y}$ = Usage rate for technologies in project scenario p in year y (fraction)

$SE_{b,y,CO2}$ = Specific CO_2 emissions for a baseline b technology in year y (tCO_2/technology*day)

$SE_{b,y,non-CO2}$ = Specific non-CO_2 emissions for a baseline b technology in year y (tCO_2e/technology*day)

$f_{NRB,i,y}$ = Fraction of biomass used in year y for baseline scenario b that can be established as non-renewable biomass (fraction).

The approach to accounting project emissions from AWMS follows method 1 or IPCC Tier 1 approach. The project emissions involve emissions from the biodigester, which include:

a. Physical leakage biogas
b. Emissions from the use of fossil fuels or electricity for the operation

$$PE_{AWMS,y} = PE_{PL,y} + PE_{power,y} \quad (6)$$

Where:

$PE_{AWMS,y}$ = Project emissions in year y (tCO_2e)

$PE_{PL,y}$ = Emissions due to physical leakage of biogas in year y(tCO_2e)

$PE_{power,y}$ = Emissions from the use of fossil fuel or electricity for the operation of the installed facilities in the year y (tCO_2e)

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

$$PE_{PL,y} = 0.10 \times N_{b,p,y} \div 365 \times U_{p,y} \times GWP_{CH4} \times D_{CH4} \times \sum_k \sum_{i,LT} B_{O,LT} \times N_{LT,y} \times VS_{LT,y} \times MS\%_{i,y} \quad (7)$$

Where:

$PE_{PL,y}$ = Project emissions from physical leakage in year y (tCO_2e)

	GWP_{CH4} = Global Warming Potential (GWP) of CH_4 applicable to the crediting period. The value of methane applied is 28 according to the AR5 IPCC /33/ D_{CH4} = CH_4 density (0.00067 t/m^3 at room temperature (20°C) and 1 atm pressure) LT = Index for all types of livestock i = Index for animal manure management system $B_{O,LT}$ = Maximum methane producing potential of the volatile solid generated for animal type LT. $MS\%_{i,y}$ = Fraction of manure handled in project animal manure management system i *K* = Climate region (Asia) The approach to accounting for project emissions from thermal application follows method 1 or IPCC Tier 1 approach. The Project emission from thermal application in year y shall be calculated as follows: $$PE_y = \sum_{b,p} \left(N_{b,py} \times U_{p,y} \times \left(f_{NRB,i,y} \times SE_{p,y,CO2} + SE_{p,y,non-CO2}\right)\right) \quad (8)$$ Where: PE_y = Project emissions for total project activity in year y (tCO_2e/yr) $\sum_{b,p}$ = Sum over all relevant baseline b/project p pairs $N_{b,py}$ = Number of project technology-days included in the project database for each project scenario in year y. The start date is the day a plant start producing biogas. A default of 2 weeks may be use for the period from installation date and start date. $U_{p,y}$ = Usage rate for technologies in project scenario p in year y (fraction) $SE_{p,y,CO2}$ = Specific CO_2 emissions for a project b technology in year y (tCO_2/technology*day) $SE_{p,y,non-CO2}$ = Specific non-CO_2 emissions for a project b technology in year y (tCO_2/technology*day) $f_{NRB,i,y}$ = Fraction of biomass used in year y for project scenario b that can be established as non-renewable biomass (fraction). The parameter $f_{NRB,p,y}$ is excluded from this equation when the observed project additional fuel is fossil fuel. Determining $SE_{p,y,CO2}$ and $SE_{p,y,non-CO2}$

The following formula is used to calculate $SE_{p,y,CO2}$:

$SE_{p,y,CO2} = \sum_i P_{p,i,y} \times NCV_{p,i,fuel} \times EF_{p,i,fuel,CO2}$; (9)

and

$SE_{p,y,CO2} = \sum_i P_{p,i,y} \times NCV_{p,i,fuel} \times EF_{p,i,fuel,non-CO2}$ (10)

i = Index for the type of project/fossil fuel consumed

Pp,i,y = Average yearly consumption of project fuel i per household(tonnes/household/year)

$NCVp,i,fuel$ = Net calorific value of the fuel(s) i that is used in project p (TJ/tonne)

$EFp,i,fuel,CO2$ = CO_2 emission factor arising from use of fuels i in project scenario (tCO_2/TJ)

$EFp,i,fuel$,non-$CO2$ = non-CO_2 emission factor arising from use of fuels i in project scenario (tCO_2/TJ)

A baseline survey covering the target household population was conducted in April-August 2023. The results indicate that the dominant types of fuel used in the baseline scenario are: LPG (113 housesholds or 69% of total) and biomass (50 households or 31% of total). This indicates that the fuel types used is same as that in the BFT which was executed in the period from the 29th December 2023-2nd April 2024.

Therefore, for determining $P_{p,i,y}$, the results from the PFT testing were used. In the PFT, 89 randomly selected household from the project database. Simple random sampling, each observation is chosen randomly and entirely by chance, such that each observation has the same probability of being chosen. Oversampling was conducted to minimise the necessity to redo the KPT in cases of wrongly filled out questionnaires or unreliable results. Outliers were excluded using the Grubb's test. A significance of 0.01, two-sided has been applied. All data has been deemed consistent and passes the Grubb's test assessment /5//7-8//14/.

Determining $P_{p1,fuel,y}$
On average, project households used 143.04 kg of LPG per year equivalent to 11.92 kg per month. This equals to 0.00039 tons per day.

Determining $P_{p1,bio,y}$
On average, each project household uses 251.62 kg per year which is equivalent to 20.97 kg per month. This equals to 0.00069 tons per day /14/.

Determining $P_{p1,kero,y}$
On average, each project household uses 67.98 kg per year which is equivalent to 5.66 kg per month. This equals to 0.000186 tons per day /14/.
Emission reductions from VPA-1

The emission reductions for each of the two components (AWMS and thermal energy) are calculated separately as follows:

$ER_y = BE_y - PE_y - LE_y$ (10)

Where:

ER_y = Emission reductions in year y (tCO_2e/yr)

BE_y = Baseline emissions in year y (tCO_2e/yr)

PE_y = Project emissions in year y (tCO_2e/yr)

LE_y = Leakage emissions in year y (tCO_2e/yr)

The total emission reduction from project activity will be the sum of emission reductions from AWMS and Thermal energy.

Parameters fixed ex-ante:

Data/ parameter	Description	Source of data	Value(s) applied	Choice of data or Measurement methods and procedures
Avoidance of double counting or double claiming among project participants	Evidence of avoidance of double counting or double claiming with other parties directly involved with the project or programme.	Double counting is avoided through recording the unique serial number of each biodigester in a centralised database system operated by the CME. Participating users will confirm that they are not taking part in other registered PoAs through signing of a Household Agreement for each biodigester as "written assertion" reflected in the methodology applied /5/.	N/A	Recording during biodigester installation, as well as agreements signed with beneficiaries
Avoidance of double counting or double claiming with other mitigation actions	Review and analysis of mitigation actions in other voluntary market or UNFCCC/compliance mechanisms	Publicly available information from Gold Standard and other voluntary standards such as the following: - Ecoregistry: https://www.ecoregistry.io/pro-jects-list/cercarbono-co2 and https://www.ecoregistry.io/over-lapping - Bio-carbon Registry platforms: https://globalcarbontrace.io/ projects?project_id=&project_name=&hol-der=&sector=&projectType=&objective=&status=&country= - Carbon Standard (VCS-Verra): https://registry.verra.org/app/search/VCS/All%20Projects - CDM: https://cdm.unfccc.int/Projects/projsearch.html	N/A	Constant revision of publicly available information from Gold Standard and other voluntary market as Verra or UNFCCC/compliance mechanisms

	Regulatory framework for provision of animal waste management and thermal energy services.	Evidence that the project does not undermine or conflict with any national, sub-national or local regulations or guidance for thermal energy supply/devices or fuel supply or use.	Two national regulations are relevant to biogas dissemination in Indonesia, which are: (1) energy mix target (legitimized in 2006 and renewed in 2017) and (2) the national climate change mitigation plan for climate change or NAMA (legitimized in 2011). Both regulations are related to the emergence of biogas programs. (1) has a target of 10% of bioenergy by 2025, including a sub target for biogas on household scale. (2) is targeted to achieve 26% emission reductions by 2020 and includes biogas as one of the action plans. The IDBP team participated in a workshop of developing biogas sector in Indonesia organized by the Directorate General of New, Renewable Energy and Energy Conservation of the Indonesian Ministry of Energy and Mineral Resources. Furthermore, IDBP has been engaging with a wide range of stakeholders in developing the biogas sector in the country. This evidence that the project complies with the regulatory framework of Indonesia.	N/A	Constant revision of national, sub-national and local regulations or guidance for provision of thermal energy services/devices of domestic biodigesters that the project provides in the project boundary, including any tariff requirements
	Project technology description	The detailed description of the project technology (including both biodigester and biogas stove) shall include as a minimum: - manufacturer name (if applicable), - product name (if applicable), - technology type, - capacity characteristics (e.g., volume of digester14), - continuous useful energy output	IDBP database and guarantee contracts /68/	N/A	IDBP have in power documentation on manufacturer specifications, commercial guarantees and technical reports from the installer, that are reviewed and updated if applicable.

Expected technical life of project technology	The expected technical life of an individual project technology shall be defined in the PDD.	Scientific literature finds that domestic biodigesters typically have lifetimes of 25-35 years. With normal usage of 2.74 hours per day and an assumed lifetime of 30 years, this makes 30.000 hours[3] /38/.	30.000	IDBP have in power documentation on manufacturer specifications, commercial guarantees and field studies from similar technology, that are reviewed and updated if applicable
Baseline scenario survey results	Report the results of the baseline scenario survey	Sheet Baseline_QNaire_2023_ver_4	N/A	N/A
GWP_{CH4}	Global Warming Potential (GWP) of CH4 applicable to the crediting period	IPCC AR5	28	Constant revisions of IPCC updates

Parameters related to AWMS:

Data/ parameter	Description	Source of data	Value(s) applied	Choice of data or Measurement methods and procedures
$MS\%_{BL,j}$	Fraction of manure handled in baseline animal manure management system j	Default values from table 10.A.6 (New) 'Emissions from Livestock and Manure Management' under the volume 'Agriculture, Forestry and other Land use' of the 2019 IPCC Guidelines for National Greenhouse Gas Inventories (AWMS method 1). This option follows path b. of the methodology applied /5/	Anaerobic lagoon = 0 Liquid/Slurry = 1 Solid storage = 21 Dry lot = 29 Daily spread = 0 Digester = 0 Burned for fuel = 11 Paddlock = 38	Constant revisions of IPCC updates

[3] Rajendran, K., Aslanzadeh, S., Taherzadeh, M. (2012) Household Biogas Digesters—A Review. Energies. Available at https://www.mdpi.com/1996-1073/5/8/2911

EF_{LT}	Animal manure methane emission factor by average temperature	Default values from table 10.14 of chapter 'Emissions from Livestock and Manure Management' under the volume 'Agriculture, Forestry and other Land use' of the 2019 IPCC Guidelines for National Greenhouse Gas Inventories, as indicated in the methodology applied /5/.	Uncovered anaerobic lagoon = 69.7 Liquid/Slurry = 66.2 Solid storage = 4.4 Dairy spread = 0.9 Dry lot = 1.7 Burned for fuel = 8.7	Constant revisions of IPCC updates
$VS_{rate,LT}$	Default Volatile solids production/excretion rate per animal of livestock LT in year y.	IPCC default: Table 10.13A of Chapter 10 of chapter 'Emissions from Livestock and Manure Management' under the volume 'Agriculture, Forestry and other Land use' of the 2019 IPCC Guidelines for National Greenhouse Gas Inventories.	9	Method 1 of the methodology applied /5/ – IPCC Default Values. Constant revisions of IPCC updates
TAM_{LT}	Typical animal mass for livestock LT	Table 10A.5 as well of Chapter 10 of chapter 'Emissions from Livestock and Manure Management' under the volume 'Agriculture, Forestry and other Land use' of the 2019 IPCC Guidelines for National Greenhouse Gas Inventories, as indicated in the methodology applied /5/.	386 kg per dairy cow for Asian continent	Fixed parameters. Constant revisions of IPCC updates
B_{0LT}	Maximum methane production potential of the volatile solid generated for animal type LT.	Table 10.16A of Chapter 10 of chapter 'Emissions from Livestock and Manure Management' under the volume 'Agriculture, Forestry and other Land use' of the 2019 IPCC Guidelines for National Greenhouse Gas Inventories, in line with option b. of the methodology applied /5/.	0.13 for low productivity system	Fixed parameters. Constant revisions of IPCC updates

Parameters related to Thermal application:

Data/ parameter	Description	Source of data	Value(s) applied	Choice of data or Measurement methods and procedures
$EF_{b,i,CO2}$	CO2 emission factor arising from use of fuels in baseline scenario	Methodology applied default values for wood and charcoal /5/. IPCC (2006) Guidelines for National Greenhouse Inventories. Volume 2: Energy. Chapter 2 Stationary Combustion, default values for kerosene and LPG.	Wood: 112 tCO_2/TJ LPG = 63.1 tCO_2/TJ Kerosene = 71.9 tCO_2/TJ	Constant revisions of IPCC updates
$EF_{b,i,non-CO2}$	Non-CO2 emission factor arising from use of fuels in baseline scenario	Wood: Methodology default /5/: - 9.46 tCO_2e/TJ (AR5 GWP) or - 8.692 tCO_2e/TJ (AR4 GWP) Charcoal: Methodology defaults: - 5.865 tCO_2e/TJ (AR5 GWP) (combustion only) - 44.83 tCO_2e/TJ (AR5 GWP) (includes charcoal production emissions), - Methodology cap: 92.29 tCO_2e/TJ (AR5 GWP) (includes charcoal production emissions), or - 5.298 tCO_2e/TJ (AR4 GWP) (combustion only) - 40.26 tCO_2e/TJ (AR4 GWP) (includes charcoal production emissions) - Methodology cap: 82.90 tCO_2e/TJ (AR4 GWP) (includes charcoal production emissions) IPCC defaults: - LPG = 63.1 tCO_2/TJ - Kerosene = 71.9 tCO_2/TJ	Wood: 112 tCO_2/TJ LPG = 63.1 tCO_2/TJ Kerosene = 71.9 tCO_2/TJ	Constant revisions of IPCC and methodology applied updates
$NCV_{b,i}$	Net calorific value of the fuels used in the baseline	Methodology applied default values for wood and charcoal /5/. IPCC (2006 – volume 2, chapter 2, table 2.2) defaults for kerosene and LPG.	Wood: 0.0156 TJ/ton Kerosene: 0.0438 TJ/ton LPG: 0.0473 TJ/ton	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. Constant revisions of IPCC and methodology applied updates.
$NCV_{p,i}$	Net calorific value of the fuels used in the project	Methodology applied defaults for wood and charcoal, while IPCC defaults for kerosene and LPG.	Wood: 0.0156 TJ/ton Kerosene: 0.0438 TJ/ton LPG: 0.0473 TJ/ton	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.

$P_{b,i,y}$	Average yearly consumption of baseline fuel i per household before the start of the project activity or at the renewal of each crediting period, whichever is later.	KPT 2023 as per option set in the methodology applied /5/: 20240705 KPT December 2023_YRE1 | Tab 90-30 test | Cells F62-L62. Further details are displayed in the following section D.6. below, for $T_{s,y}$ parameter.	Biomass: 0.449 tonnes/household/year Kerosene: 0.028 tonnes/household/year LPG: 0.287 tonnes/household/year	At the start of crediting period (fixed).

Sustainable Development Goals /41-42//47-49/**:**

Data/ parameter	Description	Source of data	Value(s) applied	Choice of data or Measurement methods and procedures
(SDG 1– No poverty: GSDM-I1.1.1) $C_{f,b,y}$	Total cost of fuel 1 in year y in baseline	Baseline survey	LPG = 20,730 Indonesian Rupiahs Wood = 559 Indonesian Rupiahs	Revision in every baseline survey done by the PP
(SDG 2 – Zero Hunger: GSDM-I2.4.7) $BL_{bio,y}$	Total baseline area (hectares) applied with bioslurry	GS SDG Tool /80/	0 ha	Baseline is 0 based on the GS SDG Impact Tool
(SDG 5 – Gender equality: GSDM-I5.5.1) $T_{b,y}$	Time spent on collecting fuel wood for cooking cleaning per household per day prior to project (hours)	Indonesia value from the State of the Global Clean and Improved Cooking Sector, world bank 2015	1.2 hours	Fixed data from the GS SDG impact tool
(SDG 7 – Affordable and clean energy: GSDM-I7.2.2) Th_{cap}	Thermal energy production from biodigester	Calculated "VPA 1 ER calculation CP renewal | Tab Capacity calculation | Cell C7"	1.91 MJ/day	Table 13 of the VPA-DD, where calculations are described. This table is also represented below, on the following section D.6. of this report, for SDG 7.

Net GHG Emission Reductions

The ex-ante GHG emission reductions are calculated as explained above. The following table summarizes the results estimated for the crediting period:

Year	Baseline Estimate (tCO_2e)	Project Estimate (tCO_2e)	Net Benefit (VERs/Year)
Year 2025*	43,490.5	17,794.5	25,695.5
Year 2026	86,981	35,589	51,393
Year 2027	86,981	35,589	51,393
Year 2028	86,981	35,589	51,393
Year 2029	86,981	35,589	51,393
Year 2030	86,981	35,589	51,393

	<table><tr><td>Year 2031</td><td>86,981</td><td>35,589</td><td>51,393</td></tr><tr><td>Year 2032**</td><td>43,490.5</td><td>17,794.5</td><td>25,695.5</td></tr><tr><td>Total</td><td>608,869</td><td>249,120</td><td>359,749</td></tr><tr><td>Annual Average</td><td>86,981</td><td>35,589</td><td>51,393</td></tr></table> * from June 1st ** until May 31st The validation team reproduced calculations /6/ to ensure accuracy and correctness of the results. Conversion factors, formulas, and calculations were provided by the PP in spreadsheet format to ensure all formulas were accessible for review. Where applicable, references for analysis methods or default values were checked against relevant scientific literature for best practice.
Findings	No findings were found regarding this issue.
Conclusion	The GS4GG VPA-DD of the project activity was checked by the assessment team and found that the Gold Standard Methodology for Animal Manure Management and Biogas use for Thermal Energy Generation, version 1.1, is used which is the latest methodology version applied by the GS4GG (as the GS tool kit recommends the application of the latest version of the applied methodology along with the conservative argument of the approach followed). As previously reflected, the project follows the main formula for method 1 or IPCC Tier 1 approach. This was used for the calculation of baseline emissions (from AWMS and from thermal application), project emissions (from AWMS and from thermal application) and emission reductions. Hence, emission reduction calculation at this time of validation is conservative, appropriate and found to be correct by the VVB. The validation team reproduced calculations of the project to ensure accuracy and correctness of the results. Conversion factors, formulas, and calculations were provided by the PP in spreadsheet format to ensure all formulas were accessible for review /6/. Where applicable, references for analysis methods or default values were checked against relevant scientific literature for best practice. In AENOR´s opinion, the PP has documented in the final version of the VPA-DD the information used to estimate GHG emission removals in accordance with the requirements of the latest approved version of the methodology and tools applied to the determination of the emission removals and the project emissions and leakage emissions. All estimates of the baseline, project and leakage emissions can be replicated using the data and parameter values provided in the VPA-DD. In essence, the methodology was correctly applied following the requirements. All values in the VPA-DD are considered reasonable in the context of the proposed project activity. Data sources are quoted correctly. Hence, the calculation of baseline and project emissions and removals and the estimated net GHG emission removals are considered correct /5-6/.

D.6. Validity of monitoring plan

Means of validation	The project applies the Gold Standard Methodology for Animal Manure Management and Biogas use for Thermal Energy Generation (version 1.1). The audit team checked all parameters presented in the monitoring plan against the requirements of the methodology and the GS requirements. The project's monitoring plan outlines key Sustainable Development Goal indicators. Section B.7.1 of the VPA-DD details Data and parameters to be monitored. AENOR's audit team has reviewed each one of the data and parameters included in the mentioned Section B.7.1, crosschecking the information and assessing, first, if all the data and parameters described in the methodology and applied tools are included, second, if sources of data and values applied are in accordance with the methodology and applied tools, and third, if all the sections mandatory to answer are in according to the template guide

Furthermore, expected values for monitoring parameters have been obtained from verified and issued latest verifications, ensuring its validity and accuracy.

The monitored parameters are the followings:

SDG 13:

Data / Parameter	Description		Value(s) applied/Unit
Avoidance of double counting or double claiming among project technology end users	Evidence of avoidance of double counting or double claiming with project technology end users. **Source of data**: IDBP database, Tab MASTER VPA1, Column A. **Measurement methods and procedures**: Double counting is avoided through recording the unique serial number of each biodigester in a centralised database system operated by the CME. Participating users will confirm that they are not taking part in other registered PoAs through signing of a Household Agreement for each biodigester. **Monitoring frequency**: Monitored whenever project technology is sold or otherwise disseminated. **QA/QC procedures**: Cross check using general internet search and search of public records of Gold Standard and other voluntary market and UNFCCC mechanisms.		N/A
$U_{p,y}$	Average usage rate in project scenario p during year y. **Source of data**: Collected through the annual Biogas User Survey: See Drop_off_BUS2023_rev Tab " Drop-off_2023", Cell I30 /8/. **Measurement methods and procedures**: 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. **Monitoring frequency**: Annual. **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).		0.899%
	VVB assessment and cross-checked: Through the source of data represented, the cumulative usage rate for technologies by age group (8 to 14 for VPA-1) are observable through the cell indicated, based on cumulative adoption rate and drop off rate (fraction). The VVB has verified the data through the traceability of the column "Proportion", cells I15-I21, which considers the % units in operation and the units built in that period divided by the total units (20,252). The former, considers 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 by 0.899.		

$N_{LT,y}$	Annual average number of animals of type LT in year y. **Source of data**: Collected through the annual Biogas User Survey (ER spreadsheet "VPA 1 ER calculation CP renewal", tab "EX-ante 2025", cellE11, through "Baseline_QNaire_2023_ver_4 | sheet "Data"| Cells AZ135 and BO128 ") /6//39/. **Measurement methods and procedures**: A baseline survey covering the target household population was conducted in April 2023. Calculated based on $N_{LT,v}$ and $n_{d,y}$. **Monitoring frequency**: Annual. **QA/QC procedures**: - **VVB assessment and cross-checked:** The monitored value applied of 3.61 for dairy cows is represented in the ER spreadsheet and comes from the number of days the animal is alive (298.37 days) per the average of animals produced annually by 4.41 head/hh. These results are obtained in the survey "Baseline QNaire 2023", where the average of 134 households responses have been considered with the following questions: i- The amount of dairy cattle that the hh has; and ii- Average days dairy cattle were alive in a year.	3.61
nd_y	Number of days the treatment plant was operational in year y. **Source of data**: IDBP database /10/. **Measurement methods and procedures**: The actual cumulative number of biodigester non-operational days will be confirmed upon verification. The equation to calculate this is (n_{dy} = 365 – non-operational days). **Monitoring frequency**: Annual. **QA/QC procedures**: As per procedures of the IDBP database. **Additional comment**: 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.	365 days
$N_{da,y}$	Number of days the animal is alive in the farm in the year y. **Source of data**: Baseline survey. Baseline_QNaire_2023_ver_4, Tab Data, Cell BO128 /39/. **Measurement methods and procedures**: Wood consumption results are analysed separately for each season. A baseline survey covering the target household population was conducted in April 2023. A total of 125 end users without project technologies representative of the end users targeted in the VPA were surveyed nationwide. Respondents were asked to clarify how many days their animals were alive in the preceding year. The households reported their dairy cows were alive on average 298.37 days in the preceding 365 days and their pigs were alive 333 days on average in the preceding 365 days. **Monitoring frequency**: Annual, ex-post value to be derived from the Biogas User Survey. **QA/QC procedures**: -	298.37

	VVB assessment and cross-checked: This result has been obtained from the survey "Baseline QNaire 2023", where the average of 134 households responses have been considered, with the following question for this parameter: Average days dairy cattle were alive in a year (column BO of the Excel file, cell BO128).		
$N_{p,y}$	Annual average number of animals of type LT for the year y.		Dairy cows = 4.408
	Source of data	Baseline survey, 2023. See: "Baseline_QNaire_2023_ver_4|Sheet 'Data'|Cell AZ135.	
	Measurement methods and procedures	A baseline survey covering the target household population was conducted in April 2023. A total of 125 end users without project technologies representative of the end users targeted in the VPA were surveyed nationwide. Respondents were asked to clarify what types and how many animals they are keeping. In total, 89.6% of the households reported to keep dairy cows (average of 4.9 heads). This means that total average of animals kept per household averages ((0.896*4.9) = 4.408.	
	Monitoring frequency	Annual.	
	QA/QC procedures	-	
	VVB assessment and cross-checked: This result has been obtained from the survey "Baseline QNaire 2023", where the average of 134 households responses have been considered, with the following question for this parameter B.10.i. The amount of dairy cattle do you have (column AZ of the Excel file, cell AZ135).		
TAM_{LT}	Typical animal mass for livestock LT.		386 kg per dairy cow for Asian continent
	Source of data	Table 10A.5 (title: default values for live weights for animal categories), page 117 of Chapter 10 of chapter 'Emissions from Livestock and Manure Management' under the volume 'Agriculture, Forestry and other Land use' of the 2019 IPCC Guidelines for National Greenhouse Gas Inventories.	
	Measurement methods and procedures	Fixed parameters. The value will be updated based on any updates in the IPCC Guidelines for National Greenhouse Gas Inventories.	
	Monitoring frequency	Annual	
	QA/QC procedures	-	
$MS\%_{i,y}$	Fraction of manure handled in project animal manure management system i.		1%
	Source of data	Annual Biogas Users Survey that will collect data from users on the amount of manure fed into biodigester /6/.	
	Measurement methods and procedures	Biogas users will be asked about the fraction of manure fed into the biodigesters. If animal manure is treated in different treatment systems manure weight delivered to each system shall be directly measured or alternatively manure volume can be measured together with the density determined from representative sample (90/10 precision). The quantity of animal manure from different farms and different animal types shall be recorded separately for cross-check. Recording of the baseline animal manure management system where the animal manure	

	would have been treated anaerobically is also required. **Monitoring frequency** Annual. **QA/QC procedures** - **Additional comment** Applicable to method 2	

Parameters related to Thermal energy application:

Data / Parameter	Description	Value(s) applied/Unit
$N_{b,p,y}$	Number of project technology-days included in the project database for each project scenario in year y. **Source of data**: IDBP Database. Calculated from the Project database (see section 4.1.3 | Project database) as the sum of the number of installed project technology units times the calendar days during the year y that they were used at the end user locations. **Measurement methods and procedures**: The actual cumulative number of biodigester non-operational days will be confirmed upon verification. The equation to calculate this is ($O_{p,y}$ = 365 – non-operational days). **Monitoring frequency**: Continuous. **QA/QC procedures**: As per procedures of the IDBP database. Results will be cross-checked with the contents of the project database to confirm whether the project technology units surveyed are present at end user locations as expected, or not.	365 days
$LE_{p,y}$	Leakage in project scenario p during year y. **Source of data**: Methodology default (section 3.7) /5/. **Measurement methods and procedures**: Methodology default. **Monitoring frequency**: Every two years, or default discount value of 0.95 applied to emission reductions. **QA/QC procedures**: Compliance with the general requirements for sampling (Section 4.4) and general requirements for QA/QC (Section 4.5).	0.95
$fNRB_{i,y}$	Fractional non-renewability status of woody biomass fuel during year y, in case the baseline fuel is biomass or charcoal. **Source of data**: Applied CDM Tool33. Calculation based on the fNRB application for GS4GG certification /57//80/. **Measurement methods and procedures**: CDM TOOL33 **Monitoring frequency**: Determined ex-ante and fixed for a given crediting period. **QA/QC procedures**: CDM TOOL33. **Additional comment**: - **VVB assessment and cross-checked:** By following the fNRB application for GS4GG certification version 1, CDM Tool33 version 3 is applied: default value by 9% for Indonesia reflected in Table 3 of the document.	9%

	$P_{p,i,y}$	Quantity of fuel that is consumed in project scenario p during year y. **Source of data**: 20240705 KPT December 2023_YRE1 | Sheet "90-30 test" Cells W99, Z99 and AC99 applied /14/ according to the "Project performance field tests as per the methodology". See section 4.1 of the methodology /5/. **Measurement methods and procedures**: - **Monitoring frequency**: Updated every two years, or more frequently. The KPT values are valid for two years and may be applied for before or after period. **QA/QC procedures**: Compliance with the general requirements for sampling (Section 4.4 |), general requirements for QA/QC (Section 4.5 |) and Annex 2: COMPLEMENTARY GUIDELINES FOR KITCHEN PERFORMANCE TESTING **VVB assessment and cross-checked:** These results are obtained from the KPT (December 2023) done by the PD, where the corresponding averages indicated in the cells above come from the following: I- Biomass: 251.62kg (cell W98) from the average per day (0.69) calculated from the 89-sampling determined (column W). These results come from "Biogas HH 2023" tab, column BI, responses to question "Q12d.1. Total usage of WOOD FUEL", which subtracts the results of columns BG and BH, questions "Q12b.1. The weight/volume of WOOD FUEL at the first measurement" and "Q12c.1. The weight/volume of WOOD FUEL at the second measurement" respectively. Question Q12b.1 from column BG gets results from column AR question "Q9b.1. Weight / volume of FIREWOOD at the first measurement (kg)". II- Kerosene: 67.98kg (cell Z98) from the average per day (0.19) calculated from the 89-sampling determined (column Z). These results come from "Biogas HH 2023" tab, column BL, responses to question "Q12d.2. Total use of KEROSENE", which subtracts the results of columns BJ and BK, questions "Q12b.2. The weight/volume of KEROSENE at the first measurement" and "Q12c.2. The weight/volume of KEROSENE at the second measurement" respectively. Question Q12b.2 from column BJ gets results from column AS question "Q9b.2. Weight / volume of KEROSENE the first measurement (kg)". III- LPG: 143.04kg (cell AC98) from the average per day (0.39) calculated from the 89-sampling determined (column AC). These results come from "Biogas HH 2023" tab, column BO, responses to question "Q12d.3. Total use of LPG GAS", which subtracts the results of columns BM and BN, questions "Q12b.3. The weight/volume of LPG GAS at the first measurement" and "Q12c.3a. The weight/volume of LPG GAS at the second measurement" respectively. Question Q12b.1 from column BM gets results from column AT question "Q9b.3. Weight / volume of LPG GAS at the first measurement (kg)".	Biomass: 0.252 tonnes/household/year Kerosene: 0.068 tonnes/household/year LPG: 0.143 tonnes/household/year

SDG 1 - No Poverty: GSDM-I1.1.1

Data / Parameter	Description	Value(s) applied/Unit
$T_{s,y}$	Total costs savings from reduced fuel consumption and biodigester use. **Source of data**: Collected through the annual Biogas User Survey, KPT and calculated: "20250226 SDG outcomes", tab SDG 1, cell D16 /41/. **Measurement methods and procedures**: Calculated. **Monitoring frequency**: Annual. **QA/QC procedures**: This will be monitored through sampling to satisfy the requirements put forth by the methodology. **VVB assessment and cross-checked:** This result considers the subtraction of costs per HH per year in the baseline and project scenarios, and the repair average. The cost in the baseline scenario sums the costs of LPG (5,940,388.8 RP) and wood (250,907.15 RP). The baseline (kg/year) of both fuels is multiplied by cost per kg (20,730 RP for LPG (kg/year/HH) and 559 RP for wood (kg/year/HH)). The former has been calculated from the "20240705 KPT December 2023_YRE1", sheet "90-30 test", cells L61 (286.56kg of LPG stock average, from 53-sampling responses on questions in "Non Biogas HH 2023" tab, column AV "Q9d.3. Total use of LPG GAS", which results from the subtraction of columns AT, AU and AG: "Q9b.3. The weight/volume of LPG GAS at the first measurement", "Q9c.3a. The weight/volume of LPG GAS at the second measurement" and "Q6b.3. Weight / volume of LPG GAS at the first measurement" respectively) and F61 (448.85kg of wood stock average, from 53-sampling responses on questions in "Non Biogas HH 2023" tab, column AP "Q9d.1. Total usage of WOOD FUEL", which comes from the subtraction of columns AN, AO and AE: "Q9b.1. The weight/volume of WOOD FUEL at the first measurement", "Q9c.1. The weight/volume of WOOD FUEL at the second measurement" and Q6b.1. Weight / volume of FIREWOOD at the first measurement" respectively). The cost per kg for LPG (2,965,219.2 RP) and wood (140,655.58 RP) has been calculated from "Baseline_QNaire_2023_ver_4", "Tabulasi" tab, cell P570 (average of 20,730 RP/kg from "Data" tab, column OK for question "C.17.vi.c. Price of LPG gas used in lpg stoves lpg_kompor (RP per kg)" for 134-sampling responses) and P576 (average 559 RP/kg from "Data" tab, column JC, question "C.17.iii.a. Price of firewood used in Permanent firewood stoves (Rp per kg)". The cost in the project scenario follows the same path described for baseline, multiplying the cost per kg for both fuels but with the "Project" row 8. Here, results come from "20240705 KPT December 2023_YRE1", sheet "90-30 test", cells AC98 and W98 (questions indicated in the previous $P_{p,i,y}$ parameter assessment. Finally, the cost of biodigester repairs by 118,688 Indonesian Rupiahs is calculated in "BUS_2023_Tabulation 15072024", "Tabulasi" tab, cell Z2064. This result is reflected in the cell KE550 from "BUS_23 (comp)" sheet, KE column with question "53. Cost of damage repair (1)" on 543-sampling responses. Some CR cost size have been cross-checked through agreements with beneficiaries and reactor design reports from the project (to be filled in by the CPO at the reactor site), where costs of installation for the average size of biodigesters implemented have been corroborated by the VVB /47/.	2,966,733.17 Indonesian Rupiah

$C_{m,p,y}$	Total cost of maintenance of biodigesters in year. **Source of data**: Collected through the annual Biogas User Survey: "BUS_2023_Tabulation_15072024", tab Tabulasi, cell Z2064 /7/. **Measurement methods and procedures**: Conduct a survey to collect data on household expenditure among a representative group of households participating in the project. **Monitoring frequency**: Annual. **QA/QC procedures**: This will be monitored through sampling to satisfy the requirements put forth by the methodology. **VVB assessment and cross-checked:** As indicated above, this result is obtained from "BUS_2023_Tabulation 15072024", "Tabulasi" tab, cell Z2064. It is reflected in the cell KE550 from "BUS_23 (comp)" sheet, KE column with question "53. Cost of damage repair (1)" on 543-sampling responses.	118,688.08 Indonesian Rupiah

GSDM-I1.1.1: Average household savings i.e., decrease in expenditure on basic service such cooking, lighting, drinking

In the baseline scenario, the main sources of energy for cooking are LPG and wood. Baseline households use on average 286.56 kg of LPG per year equivalent to 23.88 kg per month. The second dominant fuel used for cooking purposes in the baseline is wood as 30.19% of households in the BFT used wood. On average, each household uses 448.85 kg per year which is equivalent to 37.40 kg per month /7//14//41//47//69/.

Project activities reduce the use of these non-renewable fuels as project householders shift to biodigester use, hence the household will save money from using less LPG, Kerosene and wood /42/.

The amount of money saved is calculated as follows:

$$T_{s,y} = C_{f,b,\,y} - C_{m,p,y} \quad (1)$$

Where:

$T_{s,y}$ = Total costs savings
$C_{f,b,\,y}$ = Total cost of fuel in year y in baseline
$C_{m,p,y}$ = Total cost of maintenance of biodigesters in year

SDG 2 - Zero Hunger: GSDM-I2.4.7:

Data / Parameter	Description	Value(s) applied/Unit
$TL_{bio,y}$	Total land area in hectares applied with bioslurry. **Source of data**: Collected through the annual Biogas User Survey. **Measurement methods and procedures**: Calculated. See GS-13 calculation 2023_ver1. Sheet 'Analysis', Cell I42 /67/. **Monitoring frequency**: Annual. **QA/QC procedures**: This will be monitored through sampling to satisfy the requirements put forth by the methodology.	7,326.95 ha

	VVB assessment and cross-checked: This result is the annual average which comes from the total area application (hectare)/year - net benefit divided by 7 years of the crediting period. The original data is obtained from the following: - Active users = 18,207 units, calculated from the total number of users of the VPA-1 by 20,252 and the drop off rate by 10.1% (rows 20 and 21 of the source of data indicated above. - Slurry usage by 77.19% obtained from "BUS_2023_Tabulation_15072024", "Tabulasi" tab, cell Z4126, which considers the used for fertilizer on the farm itself (19.6% in cell Z4123) and the dumped into the land around the pen – which is planted with grass for livestock/shrubs/other plants (57.54% in cell Z4119), both from responses to the question "76.a What is bio-slurry used for?". - Total usage /day (Kg) for whole users = 765,137, which considers the total user who usage bioslurry (multiplication of both previous indicators shown above = 14,055) and the slurry usage/month (kg) - average (Column WN - Sheet Bioslurry Utilization for VPA-1 by 1,633.1). - Total usage /month (Kg) for whole users by 22,954,104, obtained from the average slurry usage per month in kg (1,633.1) multiplied by the total user who usage bioslurry (14,055). - Area of application, where 1kg = 0.266m^2, hectare/month = 610.58ha. - Finally, area of application hectare/year = 7,326.95ha.	

GSDM-I2.4.7: Land area (hectares) under improved or new soil conservation practices as a result of project activity

The use of the slurry as an organic fertilizer on agricultural soils can significantly improve soil quality and offset costs that would otherwise be incurred in the purchase of chemical fertilizers. The nutrient value of the slurry produced has also been shown to be higher than raw manure and hence support food production /41-42//67/.

Project activities will result in use of slurry from biodigesters in the farm for food production. The area in which slurry is applied as a result of project will be calculated as follows:

$T_{Lbio,y} = P_{bio,y} – B_{Lbio,y}$ (2)

Where:
$T_{Lbio,y}$ = Total land area in hectares applied with bioslurry
$B_{Lbio,y}$ = Total baseline area (hectares) applied with bioslurry. This will be 0 as per the GS TOOL
$P_{bio,y}$ = Total project area (hectares) applied with bioslurry

SDG 5 - Gender Equality: GSDM-I5.4.1:

Data / Parameter	Description	Value(s) applied/Unit

Number of women serving in managerial/ leadership /ownership role	Refers to number of female management employees (managers) (full - time) at the organization as of the end of the reporting period. **Source of data**: IDBP. See IDBP Employee List, sheet Employee Records, cell G13 /10/. **Measurement methods and procedures**: Head count of female employees by the IDBP. **Monitoring frequency**: Annual. **QA/QC procedures**: This will be monitored through sampling to satisfy the requirements put forth by the methodology. **VVB assessment and cross-checked:** Registered list of jobs by the PP.	2
$T_{p,y}$	Time saved on collecting fuel and cooking and cleaning per household per day in project (hours). **Source of data**: Collected through the annual Biogas User Survey and calculated in: 20250226 SDG outcomes, Sheet 'SDG5', Cell B11. **Measurement methods and procedures**: Sample surveys in representative households. **Monitoring frequency**: Annual. **QA/QC procedures**: This will be monitored through sampling to satisfy the requirements put forth by the methodology. **VVB assessment and cross-checked:** This result is obtained from the subtraction of the following concepts: - Time spent collecting wood per household in the project (hours per day) = 0.06. Estimated and monitored through the BUS Tabulation (2023). See "BUS_2023_Tabulation_15072024", "Tabulasi" tab, cell Z3558. Result calculated from question "71. Time allocation doing Household work after biogas (minutes/day): Looking for firewood (mother)" in 3.36 minutes per day. Data considered in "BUS_23 (comp)" tab, column SN, with 543-sampling responses. - Time spent in collecting wood per household in the baseline (hours per day): Default for Indonesia in the GS SDG Tool /80/. - Time spent operating biodigester per household in the project (hours per day) = 0.26. Estimated and monitored through the BUS Tabulation (2023). See "BUS_2023_Tabulation_15072024", "Tabulasi" tab, cell Z3534. Result calculated from question "71. Time allocation doing Household work after biogas (minutes/day): Operating the biogas (mother)" in 15.7 minutes per day. Data considered in "BUS_23 (comp)" tab, column SM, with 543-sampling responses.	0.88 hrs/year per household

GSDM-I5.4.1: Average time saving associated with cooking time and fuel collection

In Indonesia and globally, women and girls perform the majority of unpaid domestic work. This leaves them with less time to rest, study and realize their economic potential, leaving them in time poverty. In regard to time, women are poorer than men as unpaid domestic duties, such as collecting firewood, cooking and cleaning, must be added to their market productive work, making time much scarcer. Women are widely recognized as being principally responsible for natural resource collection, including gathering of cooking fuel and for cooking and cleaning.

Project activities will reduce the amount of time the project participating households (mainly women) will spend on gathering fuel, cooking, and cleaning. This reduces *time poverty* of women because such time burden falls disproportionately on women /41-42/.

The reduction in time spent on collection fuel wood and for cooking and cleaning is calculated per household as follows:

$T_{r,y} = T_{b,y} – T_{p,y}$ (3)

Where:

$T_{r,y}$ = Total time saved on collecting fuel wood for cooking and cleaning for project activity in year y (hours)

$T_{b,y}$ = Time spent on collecting fuel wood for cooking cleaning per household per day prior to project (hours). Default value of 1.2 hours for Indonesia from GS SDG Tool.

$T_{p,y}$ = Time spent on collecting fuel and cooking and cleaning per household per day in project (hours)

GSDM-I5.5.1: Number of women serving in managerial/ leadership /ownership role

In addition, the IDBP employs women in management positions for implementing project activities. The number of women employed in management positions will be monitored annually /10//40//42//70/.

SDG 7 - Affordable and Clean Energy: GSDM-I7.1.1:

Data / Parameter	Description		Value(s) applied/Unit
Number of households benefitting from the project in year y	Refers to number of unique households that were provided access to clean fuels and technologies for domestic cooking, heating and lighting they were unable to access prior to project activity. For example, total number of households project provided access to Safe water, biogas digesters, solar home systems, etc.		20,252 units
	Source of data	Project database and SDG Outcomes excel file | Sheet 'SDG 7' Cell C3.	
	Measurement methods and procedures	The cumulative number of households benefiting from access to affordable and clean energy equal to number of households provided with a biodigester which is collected and stored in the project database.	
	Monitoring frequency	Annual.	
	QA/QC procedures	This will be monitored through sampling to satisfy the requirements put forth by the methodology.	

GSDM-I7.1.1: Number of beneficiaries: Households

The number of households benefiting from access to affordable and clean energy equal to number of households provided with a biodigester which is collected and stored in the project database.

GSDM-I7.2.2: Total thermal energy produced: Renewable

In addition, under this SDG, renewable energy generation is calculated which refers to thermal energy production from biodigesters /41-42/. The calculation is presented in the table below:

$$E = \eta * H_b * V_b$$

Where:	Value:	Comments:
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 [4]	Derived from IPCC defaults
V_b = volume of biogas	1.80 m^3/day[5]	calculated /6/
E = Energy available from the biogas system	18.87 MJ/day[6]	Calculated

SDG 8 - Decent Work and Economic Growth: GSDM-I8.3.1:

Data / Parameter	Description		Value(s) applied/Unit
Number of jobs	Refers to the number of contractual jobs the project under VPA1 provides to technicians for maintenance of biodigesters during a monitoring period.		11
	Source of data	Project database: "2024_IDBP_Database_VPA1", tab "PLANT MAINTENANCE", cell I43056.	
	Measurement methods and procedures	The IDBP database will provide number of technicians hired to conduct maintenance work during a monitoring period.	
	Monitoring frequency	Annual.	
	QA/QC procedures	This will be monitored through sampling to satisfy the requirements put forth by the methodology.	
	VVB assessment and cross-checked: Filtered for 2023 considering columns H and I of the source of data reflected above, plants maintenance date and plant maintenance done by respectively.		

GSDM-I8.3.1: Total number of jobs

The project activities under the VPA provide access to finance for biodigester users through loans from cooperatives that are LPOs (loan partner organizations) of the IDBP. This number will be monitored annually /10//40//42/.

SDG 13 - Climate Action: GSDM -I13.2.1:

See assessment described in the previous section D.5.

Findings	CL 1 was raised and closed due to some aspects to be clarified and evidenced. Appendix 4 summarizes the findings found during the validation process and how they were closed.
Conclusion	The parameters presented in the monitoring plan tables in the VPA-DD, and used for monitoring the actual SDG impacts, were taken from the guidelines suggested in the SDG Impact tool (v1.3) /42/. While data and parameters to be monitored are described in Section B.5. of the previous VPA-DD, the monitoring plan can also be shown in Section B.1 of the PoA-DD of the project: sampling design, baseline and project scenarios data collection, baseline and project emissions, monitoring surveys, etc /1-2/. In addition, information

[4] Methane has an energy value of 37.78 MJ/m^3; thus, biogas at 55% CH_4 has an energy value of 21 MJ/m^3

[5] Cow dung produces approximately 40 litres biogas per kg. Each m^3 capacity of the biodigester needs 7.5 kg dung per day. Given an average biodigester size of 6.0 m^3, 45 kg of cow dung per day is required. This translates into approximately 1.80 m^3 of gas produced per day. See Document P_Biogas_as_renewable_energy _2005.pdf, pages 79 and 140 /45/.

[6] Calculated as: 50% efficiency * 21 MJ/m^3 * 1.80 m^3/day.

	on the entities involved in the programme (users, technology suppliers, VPA implementing entity, (micro) finance institutions), operational and management plan of the programme (pre-construction form, household agreement, installation, commissioning), data recorded management, procedure to avoid double counting, procedure to ensure quality control pertaining to technical requirements of the biodigester implemented in the PoA, measures for continuous improvements of the PoA management system, etc /1//7//49//72/. The monitoring of the corresponding parameters described are being performed and it will be continued and shown in further monitoring reports. Furthermore, the previous monitoring plan was already suited with a conservative model so there is no impact on the accuracy and completeness of monitoring. In opinion of AENOR, all necessary parameters required by the selected methodology are contained in the monitoring plan. They are clearly described, and the means of monitoring detailed in the plan comply with the requirements of the methodology. Tables in section B.7.1 of the VPA-DD detail the different data variable to monitor along with the data unit, recording frequency, purpose of data, QA/QC, etc. Thus, the monitoring plan is in compliance with the applicable methodology. The monitoring plan provides means for internal data review and quality control, and the data presented by the PP included the results of these internal assessments. AENOR considers that information provided is sufficiency and the quality of that information is appropriate to determine the GHG removals and Targeted Sustainable Development Goals. AENOR validation team confirms that the monitoring plan is in line with Gold Standard Methodology for Animal Manure Management and Biogas use for Thermal Energy Generation (version 1.1). All necessary parameters required by the selected methodology are contained in the monitoring plan. They are clearly described, and the means of monitoring detailed in the plan comply with the requirements of the methodology /5/.

D.7. Crediting period

Means of validation	The first crediting period of this VPA lasted from 31/05/2011 to 30/05/2018. The second crediting period lasted from 01/06/2018 to 31/05/2025. The third crediting period will last from 01/06/2025 to 31/05/2032. There is a reconsideration deviation request presented by the PP on 10/10/2025 for the delay in the renewal process due to some exceptional circumstances /77/. The audit team checked a continuity in the Project's monitoring activities has been maintained and no monitoring gaps have existed.
Findings	No findings were found regarding this issue.
Conclusion	The crediting period requested for the renewal is correct and in accordance with the PoA CP.

D.8. CME and project participants

Means of validation	The CME is PT. Biru Karbon Nusantara, as well as the project representative of the IDBP PoA. The corresponding GS4GG Cover Letter has been provided by the PP, as well as the approval by Gold Standard on 13/10/2023 /18//43-44//81-82/. In addition, PP has provided sample carbon rights agreements stated in the Novation Agreement /95-97/. Yayasan Rumah Energi (YRE) is the VPA implementer, responsible for all the monitoring coordination of the project.
Findings	No findings were found regarding this issue.
Conclusion	CME and project participants are correctly described.

D.9. Outcome of stakeholder consultation

Means of validation	The stakeholder consultation for VPA 1 was carried out by Hivos on February 2012, as part of the validation process of the first crediting period of the VPA. During the crediting renewal process has not been necessary to carry out an additional stakeholder consultation.
Findings	No findings were found regarding this issue.
Conclusion	The validation team of AENOR reviewed that the information include in the updated VPA-DD is consistent with the information included in previous VPA-DD.

D.10. Additionality

Means of validation	AENOR has reviewed and verified that carbon finance is the main income source for the project participants to continue the project activity and monitoring practices, as described in detail in Section C in the PoA-DD and in Section B.5 in the VPA-DD and explained below through the financial barriers identified /1-2/: 1. Access to finance: Continued affordability barrier on the household level, who are mainly farmers in the locations of Indonesia that covers the project, have low purchasing power to support the high investment costs that require the biodigesters, as well as their corresponding repair and maintenance. This constitutes a high payback period (10 years) in terms of cash savings from the baseline fuel. The cost for the average size biodigester implemented by $6m^3$ has been estimated in IDR 11,000,000 (€ 663). The payback period over 10 years is far too long for the average household and is thus financially not the most accessible and attractive option for the target households, who lack the cash to cover the upfront payment associated with the purchase of the biodigester and need support by subsidy payments and micro-credit in combination with the free-of-charge repair and maintenance services that continue to be offered under the VPA-1. The VPA enables households access to micro-credit through the programme's affiliation with financial institutions. The provision of the IDR 2 million subsidy payment, the free-of-charge repair and maintenance services, and the guaranteed high quality of the biodigester reduces upfront and future costs associated with the purchase and maintenance of the biodigester. This in turn reduces the indebtedness and credit risk of the participating households, giving the affiliated financial institutions firmer security regarding the credit they extend. Without these components supported under the VPA, the affiliated financial institutions are unwilling to extend micro-credit loans to the target users as the outstanding credit risk and collection expenses are considered too high when the full cost of the biodigester is considered. The biodigester is not considered as collateral by banks and given the lack of history of a commercial market for domestic biodigesters in Indonesia, banks are reluctant to offer loans covering the entire investment cost. In addition, PP has described and demonstrated that funds that used to receive through Official Development Assistance from several sources, ended in 2021, being totally depended to carbon funds and other co-funders companies, which are very important for the provisions of repair and maintenance services among others across the many provinces covered by the VPAs /87/. - See IDBP Database provided by the PP /10/, for estimated costs (deducting subsidy) in "Precon" tab (column AV); and investment cost in "MASTER VPA1" (column AR), "CATTLE+PIG DIGESTER" (column AQ) and "OTHER DIGESTER" tabs (column AT), as well as the overview of biodigesters per size in "MASTER VPA1" tab. - The "Indonesia Domestic Biogas Program 2019 Annual Report" evidenced the following /36/: a. cost of digester construction evolution in Indonesia, its materials and the importance of carbon credits and loans for the project,

	b. the biogas energy market and business penetration in the country, where there is lack of national and regional policy measures for financing issues in biogas uptake, c. IDBP impossibilities to reach potential in the market due to the high number of subsidies to LPG demand, d. cost of obtaining fertilizer distribution as an obstacle from households, among others, e. the IDR 2 million subsidy payment and the free-of-charge repair and maintenance service provided by IDBP. - The CR cost size /47/ has been cross-checked through agreements with beneficiaries and reactor design reports from the project (to be filled in by the CPO at the reactor site), where costs of installation for the average size of biodigesters implemented have been corroborated by the VVB. - In the "Pathway Towards Economic Security: Indonesia Poverty Assessment" from 2023 by the World Bank /48/ and "Biogas diffusion among small scale farmers in Indonesia: An application of duration analysis" from 2019 /84/, clearly reflect the poor economic situation that suffers the rural population of Indonesia, where the average households have a decrease in expenditure on basic service such cooking, lighting and drinking. Also, it demonstrates clearly how is the situation of the majority of the population in the provinces represented by the project, consisting of farmers with low incomes, for whom the cost of biodigesters is an important barrier. The middle-income status is still a path that is moving forward and requires time and higher efforts. The high-skilled jobs remain scarce in Indonesia, limiting pathways towards economic security. There is a low urban migration that limits productivity gains as fewer workers can take advantage of positive agglomeration forces. Many women remained excluded from the labor force, constrained by cultural norms and home care responsibilities, thus limiting livelihoods opportunities for households. Thus, the project benefits not only by facilitating their acquisition by benefiting the livestock of each household, but also by reducing sources such as LPG and firewood consumption, leading to various household improvements and greater access to basic goods, which in turn result in a significant reduction of CO2 emissions into the atmosphere. 2. Technological: The implementation of the biodigester technology across Indonesia has also been limited due to limited knowledge of households on the existence, operation and maintenance of the technology. In the baseline scenario, households collect biomass and source fossil fuel from the marketplace, which has been the habitual norm for centuries. Switching to renewable biogas and continuing its usage once the biodigester is in place is hampered by the general lack of understanding of how the systems can benefit households, as well as traditional objections to the application of animal manure for domestic cooking purposes. Limited understanding of the biogas technology on the household level is caused by the lack of organisational efforts to: (i) educate households on the practical advantages of the technology; (ii) assist households in the purchase and installation of the systems; and (iii) provide maintenance and repair services. To maintain the sustainability of the digesters, IDBP allocates a portion of the carbon funds to repair biodigesters that have been in use for more than three years since installation. Without carbon credits, the CPO network, which are based no farther than a one-hour travel for biogas users, the repair and maintenance services are not guaranteed. This can cause users to stop using the biodigester when any element of the technology has problems, coming back households to traditional habits with fossil fuel and non-renewable biomass. Thus, the VPA has an ongoing need for carbon revenues as it continues to build capacity on both the household level and the market level. On the household level, the VPA continues to provide training to all users upon commissioning. On the market level, the VPA provides training to constructors (masons) to ensure a quality

	protocol is followed upon installation of biodigesters in the field. This way, training is extended to supervisors in the programme, which upon the reception of a certification are in the position to overlook implementation of the VPA. - Manual usage and training sessions /15//50-51/, with pictures, attendance list and reports, where it is observable the staff training and the education provided to beneficiaries regarding biodigester systems purpose, usage, repair and maintenance, as well as the services provided by the project itself. 3. Access to finance barrier on the overall VPA-level: As described in Section A.5 of the VPA-DD /1/, VPA-1 was supported through Official Development Assistance from several sources during the first crediting period. Despite this assistance, this funding was of short-term and unpredictable nature. This made it challenging to meet the continuous budget needs and to ensure a stable delivery of the support activities pursued under VPA-1. Therefore, carbon revenues have played a significant role in sustaining the activities implemented under VPA-1 during the first crediting period. Additionally, in line with p.4.1.52-a of GS4GG Principles and Requirements v2.1, the following relative proportions of project income and outgoings of the total expenditures have been explained by the PP and evidenced /85/: - 63% of total expenditure allocated to biogas investment subsidies and system maintenance, representing the majority of project outgoings. - 15% administrative costs such as human resources, travel, user training. - 16% certification-related costs, such as monitoring, verification, consultants, and Gold Standard fees. The PP has provided their corresponding accounting balance sheets and financial statements for the years 2021, 2022 and 2023, confirming the approximate figures we reviewed during a remote call /89-91/. In addition, the VVB requested a sample of evidence to corroborate accounts and financial transactions reflected in the shared income statements: /98-100/. The audit team confirmed the figures checked and deems them, as well as the information reviewed during a remote call meeting, correct and sufficient for the Ongoing Financial Need assessment /92-94/. The VVB has assessed all the explained results, deeming sources as recent, reliable and applicable to the project situation in the host country nowadays. In addition, the VVB considers that evidence provided by the PP are sufficient and reflect a realistic context with what was verified during the recent on-site visits done by AENOR during previous verifications, as well as the interviews done with the PD, project staff and beneficiaries.
Findings	No findings were found regarding this issue.
Conclusion	AENOR CONFIA revised the VPA-DD and deems the PP provided enough evidence to demonstrate additionality through the ongoing financial need for carbon revenues for VPA-1 /1//2//17//36//48//55-56//65/.

D.11. SDG Contribution

Means of validation

The project will contribute to the sustainable development by reducing GHG emissions, and also to the social and economic benefits that will be introduced in the area.

The project will contribute to the following SDG:

SDG Parameter	Indicator	Monitoring
SDG 1: No Poverty	Household financial savings	The project participants estimate household savings conducting surveys in representative household or may estimate using proxy approach. These surveys consider relevant factors that can influence changes in how much money a household spend on fuel /7//41/.
SDG 2: Zero Hunger	Land area (hectares) under improved or new soul conservation practices as a result	As no slurry is used as fertilizer on agricultural land, baseline may be zero. For the project scenario, project participant assesses through surveys

		(BUS) households using bio-slurry on land /7//42//67/.
SDG 5: Gender Equality	Time saving associated with cooking and fuel collection	The project participant estimates by surveys over household the time savings associated with cooking, where the average number of minutes required for each main cooking task, each week associated with fuel collection, percentages of household that collects fuel, average time spent per fuel collection trip and average number of fuel collection trips each household conducts each month are resulted. Where trips are made for fuel purchase, the project may assess percentage household fuel-purchasing trips conducted each month, average time spent per fuel purchasing trip and average distance travelled per trip /7//10//41-42/.
SDG 5: Gender Equality	Number of women serving in managerial/leadership/ownership role	The project participant monitors every employment position on the organization that participate in the project activity. In this case, the number of female managers employed in full-time roles at the point in time defined by the reporting end date are being considered /7//10//40-41//70/.
SDG 7: Affordable and Clean Energy	Number of beneficiaries: Households	The project participant monitors each benefited household that has been provided access to clean fuels and technologies for domestic cooking, heating and lighting who were unable to access or had limited access product/services in absence of the project. In some cases, the project might not be able to report on the number of unique households based on direct data. In such cases, the project may estimate the number of households provided access to by determining the number of units in use, number of households per unit served as per manufacturer's specification or other reliable sources. The project follows a conservative approach for such estimation and provide details of the assumptions made /10//41-42/.
SDG 7: Affordable and Clean Energy	Total thermal energy produced: Renewable	The project participant has documentation where energy production is assessed for the project activity. Type of users may include residential, commercial, institutional settings, involving energy supply to households, small farms or for use in built environment of institutions such as schools /10//41-42/.
SDG 8: Decent Work and Economic Growth	Number of individuals provided with access to finance	The project measures/calculate this data in the database and micro-loan agreement between the cooperatives and the project beneficiaries. Project database shall be securely kept in addition to the hard copies of the stove purchase form. These hard copies are used to cross check the project database records /10/.
SDG 13: Climate Action	Amount of GHGs emissions avoided or sequestered	The emission reduction calculation will be done as per the formula mentioned in the GS4GG VPA-DD. As the parameter is subjected to monitoring the same will be checked during the verification of the project activity /5-6/.

The estimated contributions are the following /42/:

SDG 1

Year	Baseline Estimate	Project Estimate	Net Benefit
01/06/2025-31/05/2026	125.4	65.3	60.1
01/06/2026-31/05/2027	125.4	65.3	60.1
01/06/2027-31/05/2028	125.4	65.3	60.1
01/06/2028-31/05/2029	125.4	65.3	60.1
01/06/2029-31/05/2030	125.4	65.3	60.1
01/06/2030-31/05/2031	125.4	65.3	60.1
01/06/2031-31/05/2032	125.4	65.3	60.1
Total	877.7	457.1	420.6
Total number of crediting years	7	7	7
Annual average over the crediting period	125.4	65.3	60.1

SDG 2

Year	Baseline Estimate	Project Estimate	Net Benefit
01/06/2025-31/05/2026	0	7,326.95	7,326.95
01/06/2026-31/05/2027	0	7,326.95	7,326.95
01/06/2027-31/05/2028	0	7,326.95	7,326.95
01/06/2028-31/05/2029	0	7,326.95	7,326.95
01/06/2029-31/05/2030	0	7,326.95	7,326.95
01/06/2030-31/05/2031		7,326.95	7,326.95
01/06/2031-31/05/2032		7,326.95	7,326.95
Total	0	51,288.7	51,288.7
Total number of crediting years	7	7	7
Annual average over the crediting period	0	7,326.95	7,326.95

SDG 5

Year	Baseline Estimate	Project Estimate	Net Benefit
01/06/2025-31/05/2026	0	2	2
01/06/2026-31/05/2027	0	2	2
01/06/2027-31/05/2028	0	2	2

01/06/2028-31/05/2029	0	2	2
01/06/2029-31/05/2030	0	2	2
01/06/2030-31/05/2031	0	2	2
01/06/2031-31/05/2032	0	2	2
Total	0	2	2
Total number of crediting years	7	7	7
Annual average over the crediting period	0	2	2

Year	Baseline Estimate	Project Estimate	Net Benefit
01/06/2025-31/05/2026	8,870,376	2,365,434	6,504,942
01/06/2026-31/05/2027	8,870,376	2,365,434	6,504,942
01/06/2027-31/05/2028	8,870,376	2,365,434	6,504,942
01/06/2028-31/05/2029	8,870,376	2,365,434	6,504,942
01/06/2029-31/05/2030	8,870,376	2,365,434	6,504,942
01/06/2030-31/05/2031	8,870,376	2,365,434	6,504,942
01/06/2031-31/05/2032	8,870,376	2,365,434	6,504,942
Total	62,092,632	16,558,035	45,534,597
Total number of crediting years	7	7	7
Annual average over the crediting period	8,870,376	2,365,434	6,504,942

SDG 7

Year	Baseline Estimate	Project Estimate	Net Benefit
01/06/2025-31/05/2026	0	139.7	139.7
01/06/2026-31/05/2027	0	139.7	139.7
01/06/2027-31/05/2028	0	139.7	139.7
01/06/2028-31/05/2029	0	139.7	139.7
01/06/2029-31/05/2030	0	139.7	139.7
01/06/2030-31/05/2031	0	139.7	139.7
01/06/2031-31/05/2032	0	139.7	139.7

Total	0	978	978
Total number of crediting years	7	7	7
Annual average over the crediting period	0	139.7	139.7

Year	Baseline Estimate	Project Estimate	Net Benefit
01/06/2025-31/05/2026	0	20,252	20,252
01/06/2026-31/05/2027	0	20,252	20,252
01/06/2027-31/05/2028	0	20,252	20,252
01/06/2028-31/05/2029	0	20,252	20,252
01/06/2029-31/05/2030	0	20,252	20,252
01/06/2030-31/05/2031	0	20,252	20,252
01/06/2031-31/05/2032	0	20,252	20,252
Total	0	20,252	20,252
Total number of crediting years	7	7	7
Annual average over the crediting period	0	20,252	20,252

SDG 8

Year	Baseline Estimate	Project Estimate	Net Benefit
01/06/2025-31/05/2026	0	6	6
01/06/2026-31/05/2027	0	6	6
01/06/2027-31/05/2028	0	6	6
01/06/2028-31/05/2029	0	6	6
01/06/2029-31/05/2030	0	6	6
01/06/2030-31/05/2031	0	6	6
01/06/2031-31/05/2032	0	6	6
Total	0	6	6
Total number of crediting years	7	7	7
Annual average over the crediting period	0	6	6

SDG 13

Year	Baseline Estimate	Project Estimate	Net Benefit
01/06/2025-31/05/2026	86,981	35,589	51,393

	01/06/2026-31/05/2027	86,981	35,589	51,393
	01/06/2027-31/05/2028	86,981	35,589	51,393
	01/06/2028-31/05/2029	86,981	35,589	51,393
	01/06/2029-31/05/2030	86,981	35,589	51,393
	01/06/2030-31/05/2031	86,981	35,589	51,393
	01/06/2031-31/05/2032	86,981	35,589	51,393
	Total	608,869	249,120	359,749
	Total number of crediting years	7	7	7
	Annual average over the crediting period	86,981	35,589	51,393

The validation team has checked this information against the Ex-ante SDG impact and supporting evidence /41-42/.

AENOR confirms that the information describing how the project developer intends to monitor SDGs of the proposed GS project activity was developed in accordance with GS template guide and GS Principles & Requirements /4//19/.

Findings	No findings were found regarding this issue.
Conclusion	AENOR confirms that the information describing how the project developer intends to monitor SDGs of the proposed GS project activity was developed in accordance with GS template guide and GS Principles & Requirements.

D.12. Safeguarding principles

Means of validation

The PP has undertaken an assessment against Gold Standard Safeguarding Principles and has established the following mitigation measures included in the Monitoring Plan:

The table below summarizes the results of the Safeguarding Principles Assessment completed by the PP:

Reference requirement	Question	PP Response	Justification by the assessment team
P.1 | HUMAN RIGHTS			
P.1.1.1	Does the project developer, its representatives and the Project disrespect internationally proclaimed human rights?	NO	The project takes a human rights-based approach to implementing project activities and enhances the availability, accessibility and quality of benefits and services for women consistent with the non-discrimination and equality human rights principle. The project will monitor the benefits for women including their time saved from collecting firewood for cooking in the baseline scenario and health and socio-economic benefits such as time spent on other productive activities. Also, PP will monitor the number of women employed by the project in managerial positions /12//13//40//52//70/.
P.1.1.1	Is the project involved or complicit in violence or human rights abuses of any kind as defined in the Universal Declaration of Human Rights?	NO	
P.1.1.2	Have local communities or individuals raised human rights concerns regarding the project (e.g., during the stakeholder engagement process, grievance processes, public statements)?	NO	
P.1.1.3	Is there a risk that rights-holders (e.g., Project-affected stakeholders) do not have the capacity to claim their rights?	NO	
P.1.1.3	Does this project undermine national or regional measures for the realisation of the right to development?	NO	
If the answer to any of the questions above is "yes," please explain the reason and how the project will ensure compliance with applicable requirements.			
Would the project potentially involve or lead to:			

P.1.1.1	adverse impacts on enjoyment of the human rights (civil, political, economic, social or cultural) of the affected population and particularly of marginalised groups?	NO	The audit team has not found any finding on potential adverse impacts on human rights or any type of discrimination in the project activity. The VVB deems the desctiption of human rights-based approach below as correct.
P.1.1.2	inequitable or discriminatory impacts on affected populations, particularly people living in poverty or marginalised or excluded individuals or groups, including persons with disabilities?	NO	
P.1.1.3	restrictions in availability, quality of and/or access to resources or basic services, in particular to marginalised individuals or groups, including persons with disabilities?	NO	
P.1.1.3	exacerbation of conflicts among and/or the risk of violence to project-affected communities and individuals?	NO	

Briefly describe below how the project incorporates a human rights-based approach.
For example, by describing how the project design:

- is informed by human rights analysis, including from UN human rights mechanisms (human rights treaty bodies, universal periodic review, special procedures)
- includes measures to assist the government to realise (respect, protect and fulfil) human rights under international law and to implement human rights-related standards in national law (whichever is higher)
- enhances the availability, accessibility and quality of benefits and services for potentially marginalised individuals and groups, and to increase their inclusion in decision-making processes that may impact them (consistent with the non-discrimination and equality human rights principle)
- provides reasonable accommodations to strengthen inclusivity and accessibility of project benefits and services to persons with disabilities

Project activities imrove the wellbeing of women in the project area as the distribution of biodigesters and use of clean cooking appliances saves time spent by women in collecting wood and cooking which they use for other productive activities. Use of clean energy for cooking also improves air quality in the kitchten and positivitely affecting health of women. See BUS_2023_Tabulation_15072024|Sheet 'Tabulasi' Cells AC3203 – AE3203 /7//16//70/

P.2 |GENDER EQUALITY AND WOMEN'S EMPOWERMENT

P.2.1.1	Have women's groups/leaders raised gender equality concerns regarding the project, (e.g., during the stakeholder engagement process, grievance processes, public statements)?	NO	The project activities improves the wellbeing of women, as the distribution of biodigesters and use of clean cooking appliances saves time spent by women in collecting wood and cooking and improves the quality of cooked food /10//12//13//52//70/.
P.2.1.2	Does the project undermine the principles of non-discrimination, equal treatment, and equal pay for equal work?	NO	
P.2.1.2	Does the project prevent men and women from having equal opportunities to participate in identified tasks and activities, whether through paid work, volunteer work, or community contributions, as appropriate?	NO	
P.2.1.2	Does the project limit the participation of women or men based on pregnancy, maternity/paternity leave, or marital status?	NO	
P.2.1.2	Is information about project objectives being communicated in a way that is inappropriate for the local context and not tailored to the methods of understanding of both women and men, which could hinder their participation?	NO	
P.2.1.3	Has the project assessed gender risks without referencing the country's gender strategy or equivalent national commitment?	NO	
P.2.1.4	Has expert stakeholder(s) been involved, and has their input been requested for the project design on gender equality and women's empowerment?	NO	

If the answer to any of the questions above is "yes," please explain the reason and how the project will ensure compliance with applicable requirements.

Would the project potentially involve or lead to:

P.2.1.1	adverse impacts on gender equality and/or the situation of women and girls?	NO	The audit team has not found findings on potential adverse impacts on gender equality and women's empowerment, or any type of discrimination in the project activity. The VVB deems the description of risk identification to gender equality by the PP below as correct.
P.2.1.1	exacerbation of risks of gender-based violence? For example, through the influx of workers to a community, changes in community and household power dynamics, increased exposure to unsafe public places and/or transport, etc.	NO	
P.2.1.2	reproducing discriminations against women based on gender, especially regarding participation in design and implementation or access to opportunities and benefits?	NO	
P.2.1.2	limitations on women's ability to use, develop and protect natural resources, taking into account different roles and positions of women and men in accessing environmental goods and services? For example, activities that could lead to natural resources degradation or depletion in communities who depend on these resources for their livelihoods and well-being.	NO	
Briefly describe below how the project is addressing any identified risk to gender equality and women's empowerment.			
The project activities do not have any potential risks of adverse impacts on women. On the contrary, the project imroves the wellbeing of women as the distribution of biodigesters and use of clean cooking appliances saves time spent by women in collecting wood and cooking and improves the quality of cooked food which affects health of women cooking. See BUS_2023_Tabulation_15072024|Sheet 'Tabulasi' Cells AC3203 and AE3203 /7//16/			
P.3 |COMMUNITY HEALTH AND SAFETY			
P.3.1.1	Does the project involve potential risks to the health and safety of affected communities during its life cycle?	NO	The project does not involve activities that have risks identified on community health and safety /53/.
P.3.1.2	Does the project involve any potential risks to the workers' safety and health?	NO	
If the answer to any of the questions above is "yes," please explain the reason and how the project will ensure compliance with applicable requirements.			
Would the project potentially involve or lead to:			
P.3.1.1	construction and/or infrastructure development (e.g., roads, buildings, dams)?	NO	The audit team has not found risks or potential adverse impact on health and safety in the project activity.
P.3.1.2	air pollution, noise, vibration, traffic, injuries, physical hazards, poor surface water quality due to runoff, erosion, sanitation?	NO	
P.3.1.2	harm or losses due to failure of structural elements of the project (e.g., collapse of buildings or infrastructure)?	NO	
P.3.1.2	risks of water-borne or other vector-borne diseases (e.g., temporary breeding habitats), communicable and noncommunicable diseases, nutritional disorders, mental health?	NO	
P.3.1.2	transport, storage, and use and/or disposal of hazardous or dangerous materials (e.g., explosives, fuel and other chemicals during construction and operation)?	NO	
P.3.1.2	adverse impacts on ecosystems and ecosystem services relevant to communities' health (e.g., food, surface water purification, natural buffers from flooding)?	NO	
Briefly describe below how the project is addressing any identified risk related to community health and safety.			
The project does not involve any activities that have risks identified above.			
P.4 |CULTURAL HERITAGE, INDIGENOUS PEOPLE, DISPLACEMENT AND RESETTLEMENT			
P.4.1 |SITES OF CULTURAL AND HISTORICAL HERITAGE			
P.4.1.1	Does the project involve altering, damaging, or removing sites, objects,	NO	The project covers residential and rural areas and does not involve any activities that have risk

	or structures of significant cultural heritage?		identified on cultural heritage, indigenous people, displacement and resettlement /7//12/.

If the answer to question above is "yes," please explain the reason and how the project will ensure compliance with applicable requirements.

Would the project potentially involve or lead to:			
P.4.1.1	activities adjacent to or within a cultural heritage site?	NO	The audit team has not found any finding or potential adverse impact on cultural heritage, indigenous people, displacement and resettlement of the project.
P.4.1.1	significant excavations, demolitions, movement of earth, flooding or other environmental changes?	NO	
P.4.1.1	alterations to landscapes and natural features with cultural significance?	NO	
P.4.1.1	adverse impacts to sites, structures, or objects with historical, cultural, artistic, traditional or religious values or intangible forms of culture (e.g., knowledge, innovations, practices)? (Note: projects intended to protect and conserve Cultural Heritage may also have inadvertent adverse impacts)	NO	
P.4.1.2	utilisation of tangible and/or intangible forms (e.g., practices, traditional knowledge) of Cultural Heritage for commercial or other purposes?	NO	
P.4.1.2	If answer to question above is “YES” or “POTENTIALLY” - are the communities made aware of their right under the law, scope and nature of proposed development and its potential consequences?	NA	
P.4.1.3	If answer to question above is “YES” - does the project provide equitable sharing of benefits from commercialisation of such knowledge, innovation, or practice, consistent with their customs and traditions?	NA	
P.4.1.4	If answer to question above is “YES” - are opinions and recommendations of an Expert Stakeholder(s) not sought and demonstrated as being included in the project design?	NA	
P.4.1.4	If answer to question above is “YES”, has project design been changed, modified, updated considering opinions and recommendations of an Expert Stakeholder?	NA	

If the answer is "yes" or "potentially" to any of the above questions, please provide a brief description of the project situation below. Also, provide justification and/or evidence as necessary to demonstrate compliance with applicable requirements.

P.4.2 |FORCED EVICTION AND DISPLACEMENT			
P.4.2.1	Does the project involve any risks related to involuntary relocation of people?	NO	The audit team has not found findings related to involuntary relocation of people in the project /7/.

If the answer to question above is "yes," please explain the reason and how the project will ensure compliance with applicable requirements.

Would the project potentially involve or lead to:			
P.4.2.1	risk of forced evictions or involuntary relocation of people?	NO	The audit team has not found risks or potential adverse impact on forced eviction and displacement of the project.
P.4.2.2	temporary or permanent and full or partial physical displacement (including people without legally recognisable claims to land)?	NO	
P.4.2.2	economic displacement (e.g., loss of assets or access to resources due to land acquisition or access restrictions – even in the absence of physical relocation)?	NO	
P.4.2.2	If answer to question above is “YES” or “POTENTIALLY”,	NA	

	- has the project developed Resettlement Action Plan or Livelihood Action Plan in consultation and agreement with affected individual, group or community? - has the project integrated Resettlement Action Plan or Livelihood Action Plan into the Project design?		
P.4.2.3	If answer to question above is “YES” - are opinions and recommendations of an Expert Stakeholder(s) not sought and demonstrated as being included in the project design?	NA	
P.4.2.3	If answer to question above is “YES”, have project design been changed, modified, updated considering opinions and recommendations of an Expert Stakeholder?	NA	
If the answer is "yes" or "potentially" to any of the above questions, please provide a brief description of the project situation below. Also, provide justification and/or evidence as necessary to demonstrate compliance with applicable requirements.			

P.4.3 |LAND TENURE AND OTHER RIGHTS			
P.4.3.1	Does the project involve any risks related to identifying and managing legitimate tenure rights that may be affected by the project?	NO	The audit team has not found findings to identify and manage legitimate tenure rights that may affect the project /7//12//13.
If the answer to question above is "yes," please explain the reason and how the project will ensure compliance with applicable requirements.			

Would the project potentially involve or lead to:			
P.4.3.1	impacts on or changes to land tenure arrangements and/or community-based property rights/customary rights to land, territories and/or resources?	NO	The audit team has not found any risk or adverse impact on land tenure and other rights in the project.
P.4.3.1	uncertainties with regards to land tenure, access rights, usage rights or land ownership? Examples include, but are not limited to water access rights, community-based property rights and customary rights.	NO	
P.4.3.2	Changes in legal arrangements, if yes, are the changes done in line with relevant laws and regulations?	NA	
P.4.3.2	Changes in legal arrangements, if yes, are these changes agree with free, prior and informed consent of the involved stakeholders?	NA	
P.4.3.3	Does some other entity (other than the project developer) hold uncontested land title for the entire Project Boundary?	NA	
P.4.3.4	Are opinions and recommendations of an Expert Stakeholder(s) not sought and demonstrated as being included in the project design?	NA	
P.4.3.4	If answer to question above is “YES”, have project design been changed, modified, updated considering opinions and recommendations of an Expert Stakeholder?	NA	
P.4.3.5	Have project developer in consultation with stakeholders established a functioning mechanism to receive, process, resolve, communicate and record grievances?	NA	
If the answer is "yes" or "potentially" to any of the above questions, please provide a brief description of the project situation below. Also, provide justification and/or evidence as necessary to demonstrate compliance with applicable requirements.			

P.4.4 |INDIGENOUS PEOPLES

	P.4.4.1	Does the project involve Indigenous People within the Project area of influence who may be affected directly or indirectly by the Project?	NO	The audit team has not found any finding that could affect indigenous people in the project /7//12//13.
	If the answer to question above is "yes," please explain project situation and how the project will ensure compliance with applicable requirements.			
	Would the project potentially involve or lead to:			
	P.4.4.1	affect areas where indigenous peoples are present (including project area of influence)	NO	The audit team has not found any potential finding or risk that could affect indigenous people in the project.
	P.4.4.1	affect areas, land and territory claimed by indigenous peoples?	NO	
	P.4.4.1	impacts (positive or negative) to the human rights, lands, natural resources, territories, and traditional livelihoods of indigenous peoples?	NO	
	P.4.4.7	If answer to above questions is ''YES'' or "POTENTIALLY", - Is it determined that the proposed project may affect the rights, lands, resources, or territories of indigenous people? - Has an "Indigenous People Plan" (IPP) or "Indigenous People Plan Framework" been elaborated and included in the project documentation? - Was the plan developed in accordance with the effective and meaningful participation of indigenous peoples and in accordance with UNDP Guidelines?	NA	
	P.4.4.3	risk of forcibly removing indigenous people from their lands and territories?	NO	
	P.4.4.4	utilisation and/or commercial development of natural resources on lands and territories claimed by indigenous peoples? Consider, and where appropriate ensure, consistency with the answers under Principle 4.1 above	NO	
	P.4.4.5 P.4.4.6	If answer to question above is "YES" or "POTENTIALLY" - Did the project obtain free, prior and informed consent from indigenous people before taking their cultural, intellectual, religious, and/or spiritual property? - Does the project ensure that the indigenous people receive an equitable sharing of benefits resulting from the use of their traditional knowledge and practices? ? - Does the project ensure that the sharing of benefits resulting from the use of indigenous peoples' traditional knowledge and practices is culturally appropriate and inclusive? - Does the project ensure that the provision of equitable sharing of benefits does not impede land rights or equal access to basic services including health services, clean water, energy, education, safe and decent working conditions, and housing?	NA	
	P.4.4.8	Does the project lack appropriate feedback and grievance channels for Indigenous Peoples and their representatives?	NA	

P.4.4.8	Has a grievance mechanism not been established at the beginning of programme or project implementation with due consideration given to customary dispute settlement mechanisms among the Indigenous Peoples concerned and will it remain operational throughout the project cycle?	NA	
P.4.4.9	Are opinions and recommendations of an Expert Stakeholder(s) not sought and demonstrated as being included in the project design?	NA	
P.4.4.9	If answer to question above is "YES", have project design been changed, modified, updated considering opinions and recommendations of an Expert Stakeholder?	NA	
If the answer is "yes" or "potentially" to any of the above questions, please provide a brief description of the project situation below. Also, provide justification and/or evidence as necessary to demonstrate compliance with applicable requirements.			

P.5 |CORRUPTION			
P.5.1.1	Does the project involve, or is it complicit in, contributing to or reinforcing corruption or corrupt projects?	NO	The project does not involve any activities that have risk identified on corruption /7//12//13.
P.5.1.1	Does the project have a risk of encouraging bribery, kickbacks, or other unethical behavior?	NO	
If the answer to any of the questions above is "yes," please explain project situation and how the project will ensure compliance with applicable requirements.			

ECONOMIC SAFEGUARDING PRINCIPLES			
P.6 |ECONOMIC IMPACTS			
P.6.1 |LABOUR RIGHTS AND WORKING CONDITIONS			
P.6.1.1	Does the project involve, facilitate, or condone forced labor, or pose a potential risk of forced labor?	NO	The VVB has verified that the grievance mechanism of the project is in place for employees. YRE works in accordance with the legal basis in force in Indonesia to have procedures in place for handling safety and security in both internal and external environments. Furthermore, page 25 of the SOP/foundation regulation outlines the foundation's responsibility in terms of preventing harassment and discrimination of any kind. The PP has added additional information on this issue below and the VVB deems the justification correct /10//12//13//40/.
P.6.1.1	Does the project violate any labor or health and safety laws, international obligations, or ILO conventions?	NO	
P.6.1.2	Does the project violate the principles of equal opportunity and fair treatment in its employment decisions?	NO	
P.6.1.3	Does the project violate national laws, if available regarding non-discrimination in employment?	NO	
P.6.1.4 P.6.1.5	Does the project allow child labor?	NO	
P.6.1.7 P.6.1.8	Does the project have insufficient processes and measures in place to ensure the safety and health of project workers?	NO	
P.6.1.9	Does the project have insufficient measures to safeguard and support vulnerable project workers, such as women, people with disabilities, migrant workers, and young workers, and to prevent any kind of harassment, abuse, bullying, or exploitation, including gender-based violence (GBV)?	NO	
P.6.1.10	Does the project have no grievance mechanism available for workers to voice workplace concerns? Is information about this mechanism not provided to workers at the time of recruitment, or is it not easily accessible?	NO	
If the answer to any of the questions above is "yes," please explain project situation and how the project will ensure compliance with applicable requirements.			
P.6.1.10 YRE appointed operations manager who is responsible in the workers' grievances mechanism process. Grievance mechanism for workers is available in the foundation SOP/regulations page 48 - 52. All staffs have the right to express dissatisfaction with situations relating to them and should receive fair treatment. YRE provides an enabling environment for staff to raise the problem and hope for resolutions. this policy covers situations where staff are			

	disadvantaged or dissatisfied with a problem work-related, disciplinary action or issues that may affect their work performance.Corrective action guidelines for grievances that involve staff and their direct supervisors is also available the foundation regulations. the foundation regulation is accessible and is inform to all staff /12//13/.			
	Would the project potentially involve or lead to: (NOTE: APPLIES TO BOTH PROJECT AND CONTRACTOR WORKERS)			
	P.6.1.1	use of forced labour?	NO	The audit team has not found any potential finding or risk that could affect labour rights and working conditions in the project. In addition, the PP has added clarification below /10//12//15//40//52//53/.
	P.6.1.1	working conditions that do not meet national labour laws and international commitments?	NO	
	P.6.1.1	working conditions that may deny freedom of association and collective bargaining?	NO	
	P.6.1.1	absence of documented working agreements with all individual workers *if such agreements do not exist, or do not address working conditions and terms of employment, the project developer shall provide reasonable working conditions and terms of employment.*	NO	
	P.6.1.1	use of migrant workers? *if engaged, the developer shall ensure that they are engaged substantially equivalent terms and conditions to non-migrant workers carrying out similar work.*	NO	
	P.6.1.1	having no arrangements for basic services[7] for workers? *the project developer shall put in place and implement policies on the quality and management of the accommodation and provision of basic services in a manner consistent with the principles of non-discrimination and equal opportunity. Workers' accommodation arrangements should not restrict workers' freedom of movement or of association*	NO	
	P.6.1.2	any form of discrimination or harassment based on factors unrelated to job requirements, such as gender, race, nationality, ethnicity, social or indigenous origin, religion or belief, disability, age, or sexual orientation?	NO	
	P.6.1.2	any form of discrimination in any aspect of employment, such as recruitment, compensation, working conditions, training, job assignment, promotion, termination, or discipline?	NO	
	P.6.1.2	harassment, intimidation, and/or exploitation, especially in regard to women?	NO	
	P.6.1.3	discriminatory working conditions and/or lack of equal opportunity where national law provides provision to address non-discrimination in employment?	NO	
	P.6.1.4	use of child labour? (including third-party engaged workers)	NO	
	P.6.1.4	inadequate and verifiable mechanisms for age verification?	NO	
	P.6.1.7	no processes and measures in place for the safety and health of project workers?	NO	
	P.6.1.7	No provision of safety and health training provisions, including on the proper use and maintenance of personal protective equipment conducted by competent persons and the maintenance of training records?	NO	
	P.6.1.7	No provision to record and document accidents, diseases, incidents, and any resulting injuries, illnesses, or deaths?	NO	
	P.6.1.8	occupational health and safety risks due to physical, chemical, biological	NO	

[7] Basic services requirements refer to minimum space, supply of water, adequate sewage and garbage disposal system, appropriate protection against heat, cold, damp, noise, fire, and disease-carrying animals, adequate sanitary and washing facilities, ventilation, cooking and storage facilities and natural and artificial lighting, and in some cases basic medical services.

	and psychosocial hazards (including violence and harassment) throughout the project life-cycle?		
P.6.1.9	No measures to protect vulnerable project workers from harassment, exploitation, and gender-based violence (GBV)? This includes women, people with disabilities, migrant workers, and young workers.	NO	
P.6.1.10	No grievance mechanism available for workers to voice workplace concerns.	NO	
P.6.1.11	No measures for due diligence and the establishment of policies and procedures to manage and monitor the performance of third-party employees in the project?	NO	

If the answer is "yes" or "potentially" to any of the above questions, please provide a brief description of the project situation below. Also, provide justification and/or evidence as necessary to demonstrate compliance with applicable requirements.

P.6.1.7 YRE is committed to creating a workplace that guarantees occupational safety, health and security. Every employee is expected to be responsive in dealing with emergencies that can threaten work safety, health and security. This includes understanding the types of hazards/disasters and procedures for handling safety and security in both the internal and external environments of the Foundation in accordance with the legal basis in force in Indonesia.SOP regarding occupational health safety is attached with title YRE HSE General Guidelines.

P.6.1.9 In the SOP/foundation regulation, YRE will prevent harassment and discrimination of any kind in employment, based on ethnic origin, nationality, race, color, sex, age or religion. It is available in page 25 where the regulation describe the foundation responsibility. As employer, YRE is also responsible to provide fair and equal treatment as well as encourage employee in self-development opportunities.

P.6.2 |NEGATIVE ECONOMIC CONSEQUENCES

P.6.2.1	Is there a risk of project failure during implementation or after project certification due to a lack of financial resources?	NO	The audit team has not found findings on negative economic consequences by the project.
P.6.2.2	Does the project have potential negative impacts or pose a risk to the local economy?	NO	
P.6.2.2	Are there any potential risks or negative impacts this project may have on vulnerable or marginalised social groups, despite the benefits it may bring?	NO	

If the answer to any of the questions above is "yes," please explain project situation and how the project will ensure compliance with applicable requirements.

Would the project involve or lead to:

P.6.2.2	economic impacts (negative/detrimental) to the local economy?	NO	The audit team has not found potential or risks of negative economic consequences.
P.6.2.2	negative economic consequences during and after project implementation, e.g., for vulnerable and marginalised social groups in targeted communities?	NO	

If the answer is "yes" or "potentially" to any of the above questions, please provide a brief description of the project situation below. Also, provide justification and/or evidence as necessary to demonstrate compliance with applicable requirements.

P.7 |CLIMATE AND ENERGY

P.7.1 |GHG EMISSIONS

P.7.1.1	Does the project have a risk of increasing greenhouse gas emissions over the Baseline Scenario?	NO	The project does not involve any activities that have risk identified on climate and energy /1//7//55/.

If the answer to question above is "yes," please explain project situation and how the project will ensure compliance with applicable requirements.

Would the project involve or lead to:

P.7.1.1	increase greenhouse gas emissions over the Baseline Scenario?	NO	The VVB verified that the project does not incease GHGs over the Baseline Scenario.

If the answer is "yes" or "potentially" to the above question, please provide a brief description of the project situation below. Also, provide justification and/or evidence as necessary to demonstrate compliance with applicable requirements.

P.7.2 |ENERGY SUPPLY

P.7.2.1	Does the project pose a risk to the availability and reliability of energy supply to other users?	NO	The audit team deems that the project do not have risk on reliability of energy supply to other users /7//12/.

If the answer to question above is "yes," please explain project situation and how the project will ensure compliance with applicable requirements.			
Would the project involve or lead to:			
P.7.2.1	negative impact on the availability and reliability of energy supply to other users?	NO	The audit team deems that the project do not have negative impact on reliability of energy supply to other users.
If the answer is "yes" or "potentially" to the above question, please provide a brief description of the project situation below. Also, provide justification and/or evidence as necessary to demonstrate compliance with applicable requirements.			
P.8 |WATER			
P.8.1 |IMPACT ON NATURAL WATER PATTERNS/FLOWS			
P.8.1.1	Does the project increase water usage to a level that will not allow for the maintenance of environmental flows?	NO	The project does not affect water bodies as the project activities take place at the household level and do not involve use of water. On the contrary, the collection and use of animal waste for biodigesters prevents/reduces the potential risk of erosion of land and ground water due to run-off of animal waste /7//12/.
P.8.1.1	Does the project result in the discharge of wastewater that does not meet the required standard for beneficial reuse and could therefore negatively impact the environmental flow?	NO	
P.8.1.1	Does the project have the potential risk to exceed the rate of recharge for the groundwater source?	NO	
P.8.1.1	Does the project involve any processes or activities that could contaminate the groundwater and render it unsuitable for use?	NO	
If the answer to any of the questions above is "yes," please explain project situation and how the project will ensure compliance with applicable requirements.			
Would the project involve or lead to:			
P.8.1.1	affect the natural or pre-existing pattern of watercourses, groundwater and/or the watershed(s) such as high seasonal flow variability, flooding potential, lack of aquatic connectivity or water scarcity?	NO	The audit team has not found findings or adverse impacts on natural water patterns/flows.
P.8.1.1	Wastewater discharge of quality that does not meet the required standard for beneficial reuse?	NO	
P.8.1.1	significant extraction, diversion of ground water? For example, construction of dams, reservoirs, river basin developments, groundwater extraction	NO	
P.8.1.2	Are opinions and recommendations of an Expert Stakeholder(s) not sought and demonstrated as being included in the project design?	NA	
If the answer is "yes" or "potentially" to any of the above questions, please provide a brief description of the project situation below. Also, provide justification and/or evidence as necessary to demonstrate compliance with applicable requirements.			
P.8.2 |EROSION AND/OR WATER BODY INSTABILITY			
P.8.2.1	Does the project have a risk of negatively impacting the catchment and has it been assessed and addressed?	NO	The audit team deems the description of the PP below as correct /7//12/.
If the answer to question above is "yes," please explain project situation and how the project will ensure compliance with applicable requirements.			
The project does not affect water bodies as the project activities take place at the household level and do not involve use of water. On the contrary the collection and use of animal waste for biodigesters prevents/reduces the potential risk of erosion of land and ground water due to run-off of animal waste.			
Would the project involve or lead to:			
P.8.2.2 - P.8.2.5	negatively impact on the catchment area? *If yes, Erosion prevention measures, including soil and slope protection measures, must be implemented before project commencement. These measures should involve natural terracing, infiltration strips, permanent ground cover, hedge and tree rows, and effective slope length assessment. Regular reassessment of these measures is necessary.*	NO	The audit team has not encountered findings or adverse impacts on erosion and/or water body instability.
P.8.2.6	Are opinions and recommendations of an Expert Stakeholder(s) not sought	NA	

	and demonstrated as being included in the project design?		

If the answer is "yes" or "potentially" to any of the above questions, please provide a brief description of the project situation below. Also, provide justification and/or evidence as necessary to demonstrate compliance with applicable requirements.

P.9 |ENVIRONMENT, ECOLOGY AND LAND USE

P.9.1 |LANDSCAPE MODIFICATION AND SOIL

P.9.1.1 - P.9.1.3	Is there any risk of soil resource degradation or loss of ecosystem services provided by soils in the project? If yes, the project shall maintain healthy soils by minimising negative impacts on soil health, productivity, structure, and water retention. Steps to minimise soil degradation include crop rotation, composting, using N-fixing plants, and reducing tillage and ecologically harmful substances.	NO	There is potential leakage of CO_2 in the project scenario. This has been included in the ex-ante emission reduction calculation of the project and will be monitoried by the PP. If not for the project and distributed technology, other types of more polluting fossil fuels would be used and that the project finally reduces CO_2e into the atmosphere. Additionally, the VVB has verified that the type of the project activity does not interfere with Indonesian legislation nor does it require an environment impact assessment /7//9//12/.

If the answer to question above is "yes," please explain project situation and how the project will ensure compliance with applicable requirements.

Would the project involve or lead to:

P.9.1.4	production, harvesting, and/or management of living natural resources by small-scale landholders and/or local communities?	NO	The audit team has not found risks or adverse impacts on landscape modification and soil by the project.
P.9.1.4	if answer to above question “yes” or “potentially”, does project adopt appropriate and culturally sensitive sustainable resource management practices?	NA	

If the answer is "yes" or "potentially" to any of the above questions, please provide a brief description of the project situation below. Also, provide justification and/or evidence as necessary to demonstrate compliance with applicable requirements.

P.9.2 |VULNERABILITY TO NATURAL DISASTER

P.9.2.1	Does the project have any risks associated with natural or man-made hazards that could result from land use changes due to the project?	NO	The audit team has not found vulnerability to natural disasters of any kind by the project. Additionally, the VVB has verified that the type of the project activity does not interfere with Indonesian legislation nor does it require an environment impact assessment /7//12/.

If the answer to question above is "yes," please explain project situation and how the project will ensure compliance with applicable requirements.

Would the project involve or lead to:

P.9.2.2	any potential risks that require emergency preparedness and response planning?	NO	The audit team has not found potential vulnerability to natural disasters by the project.
P.9.2.2	if answer to above question “yes” or “potentially”, did the project developer disclose appropriate information about emergency preparedness and response to affected communities?	NA	

If the answer is "yes" or "potentially" to any of the above questions, please provide a brief description of the project situation below. Also, provide justification and/or evidence as necessary to demonstrate compliance with applicable requirements.

P.9.3 |BIOSAFETY AND GENETIC RESOURCES

P.9.3.1	Does the project involve the transfer, handling, and use of genetically modified organisms/living modified organisms that may result in adverse effects on biological diversity?	NO	The audit team has not found adverse impacts on biosafety and genetic resources by the project. Additionally, the VVB has verified that the type of the project activity does not interfere with Indonesian legislation nor does it require an environment impact assessment /7//12/.

If the answer to question above is "yes," please explain project situation and how the project will ensure compliance with applicable requirements.

Would the project involve or lead to:

P.9.3.1	the transfer, handling and use of genetically modified organisms/living modified organisms (GMOs/LMOs) that result from modern biotechnology	NO	The audit team has not found potential adverse impacts on biosafety and genetic resources by the project.
P.9.3.1	If answer to above question is “yes” has a risk assessment by a competent Expert stakeholder been carried out in accordance with Annex iii of the	NA	

	Cartagena protocol on biosafety to the convention on biological diversity?		
P.9.3.2	If answer to above question is “yes” has any risks identified in the risk assessment?	NA	
P.9.3.3	Forestry (for example Afforestation/Reforestation) involving GMO planting? *Note - Forestry projects (for example Afforestation/ Reforestation) involving GMO planting are not eligible for Certification under Gold Standard for the Global Goals.*	NA	
If the answer is "yes" or "potentially" to any of the above questions, please provide a brief description of the project situation below. Also, provide justification and/or evidence as necessary to demonstrate compliance with applicable requirements.			
P.9.4 |RELEASE OF POLLUTANTS			
P.9.4.1	Does the project have a risk of releasing pollutants to air, water, and land in routine, non-routine, or accidental circumstances?	NO	The project reduces GHGs emissions to the atmosphere /6/.
If the answer to question above is "yes," please explain project situation and how the project will ensure compliance with applicable requirements.			
Would the project involve or lead to:			
P.9.4.1	any potential risk of pollutant release that cannot be avoided?	POTENTIALLY	The audit team deems the explanation of the PP below correct.
P.9.4.3	If answer to above question is “Yes” or “potentially”, has the project identified all potential pollution sources that may degrade the quality of soil, air, surface, and groundwater in the project area?	YES	
P.9.4.2	If answer to above question is “Yes” or “potentially”, do the pollution prevention and control technologies and practices applied during the project life cycle align with national regulations or international best practices?	YES	
P.9.4.3	If answer to above question is “Yes”, is there a monitoring plan to ensure that mitigation measures are implemented, and resources are protected?	YES	
If the answer is "yes" or "potentially" to any of the above questions, please provide a brief description of the project situation below. Also, provide justification and/or evidence as necessary to demonstrate compliance with applicable requirements.			
There is potential likeage of CO2 in the project scenario. This has been included in the ex-ante emission reduction calculation of the project and will be monitoried. And If not for the project and distributed technology, other types of more polluting fossil fuels would be used and that the project finally reduces CO2e into the atmosphere.			
P.9.5 |HAZARDOUS AND NON-HAZARDOUS WASTE			
P.9.5.1	Does the project involve the generation of waste materials (both hazardous and non-hazardous)?	NO	The project does not involve hazardous and non-hazardous waste. Additionally, the VVB has verified that the type of the project activity does not interfere with Indonesian legislation nor does it require an environment impact assessment /7//12/.
P.9.5.3	Does the project involve risk of release of hazardous materials resulting from their production, transportation, handling, storage, or use?	NO	
P.9.5.5	Does the project involve the use of any chemicals or materials subject to international bans or phase-outs?	NO	
If the answer to any of the questions above is "yes," please explain project situation and how the project will ensure compliance with applicable requirements.			
Would the project involve or lead to:			
P.9.5.1	the generation and management of waste materials?	NO	The audit team has not found risks or potential adverse impacts on hazardous and non-hazardous waste in the project.
P.9.5.1	treatment, destruction, or disposal of waste material?	NO	
P.9.5.1	If answer to above question is “Yes”, does the project involve an environmentally friendly method that includes appropriate control of emissions and residues resulting from the handling and processing of waste material?	NA	
P.9.5.3	risk of release of hazardous materials resulting from their production,	NA	

	transportation, handling, storage, or use?		
P.9.5.3	If answer to above question is "yes", does project has measures in place to address health risks?	NA	
P.9.5.4	Involve manufacture, trade, and use of chemicals and hazardous materials subject to international bans or phase-outs due to their high toxicity to living organisms, environmental persistence, potential for bioaccumulation, or potential for depletion of the ozone layer	NO	

If the answer is "yes" or "potentially" to any of the above questions, please provide a brief description of the project situation below. Also, provide justification and/or evidence as necessary to demonstrate compliance with applicable requirements.

P.9.6 |PESTICIDES & FERTILISERS

P.9.6.1	Does the project involve the use of chemical pesticides?	NO	The project activity does not use pesticides or fertilisers /7//12/.
P.9.6.5	Does the project involve purchase, store, manufacture, trade or use products that fall in Classes IA (extremely hazardous) and IB (highly hazardous)	NO	
P.9.6.6	Does the project use fertilisers, and if so, are measures being taken to minimise their use and nutrient losses to the environment?	NO	

If the answer to any of the questions above is "yes," please explain project situation and how the project will ensure compliance with applicable requirements.

Would the project involve or lead to:

P.9.6.1	chemical pesticides use for pest management?	NO	The audit team has not found risks or potential adverse impacts by the use of pesticides and fertilisers in the project.
P.9.6.4	If answer to question above is “yes” or “potentially”, does project has documented Chemical Pesticides Policy in place?	NA	
P.9.6.5	purchase, store, use, manufacture, or trade in Class II (moderately hazardous) pesticides?	NO	
P.9.6.5	If answer to question above is “yes” or “potentially”, does project has appropriate controls on manufacture, procurement, or distribution and/or use of these chemicals?	NA	

If the answer is "yes" or "potentially" to any of the above questions, please provide a brief description of the project situation below. Also, provide justification and/or evidence as necessary to demonstrate compliance with applicable requirements.

P.9.7 |HARVESTING OF FORESTS

P.9.7.1	Does the project have a risk of unsustainable forest management, including timber harvesting?	NO	The project activity does not use harvesting of forest. In the contrary, The use of biodigesters reduces the use of wood as fuel and the felling of trees as a consequence. Additionally, the VVB has verified that the type of the project activity does not interfere with Indonesian legislation nor does it require an environment impact assessment /7//12/.
P.9.7.1	Does the project pose a risk of depleting biodiversity and ecosystem functionality in areas where improved forest management is undertaken?	NO	
P.9.7.1	Does the project risk not meeting requirements for environment-friendly, socially beneficial, and economically viable plantations using native species whenever possible?	NO	

If the answer to any of the questions above is "yes," please explain project situation and how the project will ensure compliance with applicable requirements.

P.9.8 |FOOD SECURITY

P.9.8.1	Does the project involve the risk of negatively influencing access to and availability of food for people affected?	NO	The project activity does not affect negatively food security. On the contrary, the project activity improves quality of cooking as explained by the PP below /7//12/.

If the answer to the question above is "yes," please explain project situation and how the project will ensure compliance with applicable requirements.

Would the project involve or lead to:

P.9.8.1	modification of the quantity or nutritional quality of food available such as through crop regime alteration or export or economic incentives?	POTENTIALLY	The audit team deems the explanation of the PP below correct.

If the answer is "yes" or "potentially" to the above question, please provide a brief description of the project situation below. Also, provide justification and/or evidence as necessary to demonstrate compliance with applicable requirements.

P.9.8.1. The distribution of biodigesters and use of clean cooking appliances saves time spent by women in collecting wood and cooking and improves the quality of cooked food by using better cookstoves. See *BUS_2023_Tabulation_15072024|Sheet 'Tabulasi' Cells AC3203 and AE3203 /7/*

P.9.9 | ANIMAL WELFARE

P.9.9.1	Does the project involve any risks to animal welfare? Animal welfare shall be ensured by providing access to water and food, appropriate environment, humane treatment, and staff training. Evidence of mistreatment will be treated as an immediate non-conformity.	NO	Project activity does not affect negatively the animal welfare. On the contrary, it is impartant so that the project activity fulfills its function and the staff is well trained. The PP has added additional information on this issue below and the VVB deems it correct /7//10//15//50//51//54//64/.
P.9.9.2	Does the project involve any potential risk of excessive or inadequate use of veterinary medicines?	NO	
P.9.9.4	Does the project involve the risk of administering synthetic growth promoters, including hormones?	NO	

If the answer to any of the questions above is "yes," please explain project situation and how the project will ensure compliance with applicable requirements.

P.9.9.1. The user survey documents how project beneficiaries house and keep their cattle. See BUS_2023_Tabulation_15072024"|Sheet " BUS_23 (comp)", Columns TQ to VE /7/

Would the project involve or lead to:

P.9.9.1	animal husbandry or harvesting of fish populations or other aquatic species?[8]	NO	The audit team has not found potential adverse impacts on animal welfate by the project /54/.
P.9.9.1	limiting access for animals to basic needs like drinking water, adequate food, daylight, appropriate shelter etc.?	NO	
P.9.9.3	inadequate measures to isolate sick animals and control the spread of disease, especially zoonotic diseases?	NO	
P.9.9.5	inadequate low-stress methods, equipment, and facilities that facilitate calm animal movement.	NA	
P.9.9.6	inadequate measures to ensure that animals are exposed to the least stress possible during transportation and slaughtering?	NA	
P.9.9.7	inappropriate spacing per animal and stocking rates per land unit?	NA	
P.9.9.8	inadequate measures to address the specific needs of aquatic animals?	NA	
P.9.9.9 P.9.9.10	primary production of living natural resources such as animal husbandry, aquaculture, and fisheries? If the answer is yes, implement industry-standard sustainable management practices in line with to one or more relevant and credible standards and utilise available technologies.	NA	

If the answer is "yes" or "potentially" to any of the above question, please provide a brief description of the project situation below. Also, provide justification and/or evidence as necessary to demonstrate compliance with applicable requirements.

P.9.9.3. Manual on prevention of foot and mouth disease distributed to households /34/.

P.9.10 |HIGH CONSERVATION VALUE AREAS AND CRITICAL HABITATS

P.9.10.1	Does the project have the risk of negatively impacting HCV areas and/or critical habitats?	NO	The audit team has not found findings on high conservation value areas and critical habitats in the project. Additionally, the VVB has verified that the type of the project activity does not interfere with Indonesian legislation nor does it require an environment impact assessment /7//12/.
P.9.10.2	Does the project in the project area or area of downstream impacts have risks to the following: native tree patches, individual native trees, freshwater resources (including rivers, lakes, swamps, temporary water bodies, and wells), habitats of rare, threatened, and endangered species, and biodiversity-enhancing areas?	NO	

If the answer to any of the questions above is "yes," please explain project situation and how the project will ensure compliance with applicable requirements.

Would the project involve or lead to:

[8] 'Involve' means if the project mechanism and/or impact(s) are achieved via changing animal husbandry practices in some way.

	P.9.10.1	identified habitats as HCV areas and or Critical habitats?	NO	The audit team has not found risks or adverse impacts on high conservation value areas and critical habitats in the project.
	P.9.10.1	If answer to above question is “yes”, does the project have any risks that could negatively impact the catchment, project success, and surrounding HCV and ecological assets, as well as any measurable adverse impacts on the criteria or biodiversity values for which the critical habitat was designated, and on the ecological processes supporting that biodiversity?	NA	
	P.9.10.1	If answer to above question is “yes”, is a robust, appropriately designed, and long-term Habitats and Biodiversity Action Plan absent which will make the project unable to achieve net gains of those biodiversity values for which the critical habitat was designated?	NA	
	P.9.10.2	Does the project area or area of downstream impacts have native tree patches, individual native trees, freshwater resources (including rivers, lakes, swamps, temporary water bodies, and wells), habitats of rare, threatened, and endangered species, and biodiversity-enhancing areas?	NO	
	P.9.10.2	If the answer to the above question is “yes”, will the project have any adverse effects on these areas?	NA	
	P.9.10.3	If the answer to above question is “yes”, does the project has opportunities to minimise unwarranted conversion or degradation of the habitat and to enhance the habitat as part of its development?	NA	
	P.9.10.4	Is the project applying Land Use & Forest Activity Requirements and managing a minimum 10% of the project area to protect or enhance the biological diversity of native ecosystems following HCV approach as per the given requirements?	NA	
	P.9.10.5	Are opinions and recommendations of an Expert Stakeholder(s) not sought and demonstrated as being included in the project design?	NA	
	If the answer is "yes" or "potentially" to any of the above question, please provide a brief description of the project situation below. Also, provide justification and/or evidence as necessary to demonstrate compliance with applicable requirements.			
	P.9.11 |ENDANGERED SPECIES			
	P.9.11.1	Does the project lead to the reduction or negative impact on any recognised Endangered, Vulnerable or Critically Endangered species?	NO	The audit team has not found findings that could affect endangered species in the project. Additionally, the VVB has verified that the type of the project activity does not interfere with Indonesian legislation nor does it require an environment impact assessment /7//12/.
	If the answer to question above is "yes," please explain project situation and how the project will ensure compliance with applicable requirements.			
	Would the project involve or lead to:			
	P.9.11.2	distortion of habitats of endangered species?	NA	The audit team has not found risks or adverse impacts that could affect endangered species in the project.
	P.9.11.2	If answer to the above question is “yes”, does the project plan to protect and enhance them?	NA	
	P.9.11.2	Are opinions and recommendations of an Expert Stakeholder(s) not sought and demonstrated as being included in the project design?	NA	
	If the answer is "yes" or "potentially" to any of the above question, please provide a brief description of the project situation below. Also, provide justification and/or evidence as necessary to demonstrate compliance with applicable requirements.			
	P.9.12 |INVASIVE ALIEN SPECIES			
	P.9.12.1	Does project introduce any alien species (not currently established in the country or region of the project) into new environments?	NO	The audit team has not found findings that could affect invasive alien species in the project. Additionally, the VVB has verified that the type of the project activity does not interfere with Indonesian legislation nor does it require an environment impact assessment /7//12/.

<table>
<tr><td></td><td>
<table>
<tr><td colspan="4">If the answer to question above is "yes," please explain project situation and how the project will ensure compliance with applicable requirements.</td></tr>
<tr><td colspan="4">Would the project involve or lead to:</td></tr>
<tr><td>P.9.12.1</td><td>risk of introducing any alien species with a high risk of invasive behaviour regardless of whether such introductions are permitted under the existing regulatory framework?</td><td>NO</td><td rowspan="3">The audit team has not found risks or adverse impacts that could affect invasive alien species in the project.</td></tr>
<tr><td>P.9.12.1</td><td>risk of potential accidental or unintended introductions including the transportation of substrates and vectors (such as soil, ballast, and plant materials) that may harbour alien species.</td><td>NO</td></tr>
<tr><td>P.9.12.2</td><td>risk of spreading alien species into areas in which they have not already been established?</td><td>NO</td></tr>
<tr><td colspan="4">If the answer is "yes" or "potentially" to any of the above question, please provide a brief description of the project situation below. Also, provide justification and/or evidence as necessary to demonstrate compliance with applicable requirements.</td></tr>
<tr><td colspan="4"></td></tr>
</table>

The safeguarding principles relevant to the project activity are justified by PP based on supporting web links and references wherever applicable. These safeguarding principles assessment is validated through references given by the PP, during audit process /27/.
</td></tr>
<tr><td>Findings</td><td>CAR 2 was raised and closed due to diverse aspects contained incomplete, inconsistent and incorrect information.

Appendix 4 summarizes the findings found during the validation process and how they were closed.</td></tr>
<tr><td>Conclusion</td><td>The validation team has checked the information compiled in the VPA-DD against supporting documents and interviews.

AENOR confirms that the Safeguarding Principles Assessment has been performed in accordance with GS template guide and GS Safeguarding Principles & Requirements, v.2.1 /27/.</td></tr>
</table>

SECTION E. Internal Quality Control

Following the completion of the assessment process by the validation team, all documentation undergoes an internal quality control through a technical review before submission to Gold Standard. The technical reviewer is a qualified member of AENOR, independent from the team that carried out the validation of the project activity. The technical reviewer or the team appointed for the technical review are qualified in the technical area(s) and sectoral scope(s) of the project activity.

SECTION F. Validation opinion

AENOR has performed the validation of the renewal crediting period of Indonesia Domestic Biogas Programme of Activities (IDBP) of the PoA (ID: 1172) and the VPA-1 (GS1174).

The validation approach was based under all GS4GG's Principles and requirements issues and criteria for GS projects, the host country criteria and also on the criteria given to provide for consistent project operations, monitoring and reporting.

The validation consisted of the following three phases: i) a desk review of the project design, the baseline and the monitoring plans; ii) follow-up with site (if required) and remote interviews with project developer; iii) the resolution of outstanding issues and the issuance of the final validation report and opinion. In the course of the validation process, several corrective action requests and clarifications were raised; and all have been successfully closed.

The project participant used the latest “Methodology for Animal Manure Management and Biogas use for Thermal Energy Generation version 1.1” to calculate the emission removals of the project activity /5/.

The review of the project design documentation and additional documents related to baseline and monitoring methodology, and the subsequent background investigation, follow-up interviews and review of comments by parties and stakeholders have provided AENOR with sufficient evidence to validate the fulfilment of the stated criteria.

The conclusions can be summarised in detail as follows:

i. The project is in line with all relevant host country criteria of Indonesia and with all relevant GS requirements for GS projects.

ii. The project complies with the latest version of the updated PoA-DD v1.2, which has been also updated with recent design changes due to the incorporation in the programme of the “Methodology for Animal Manure Management and Biogas use for Thermal Energy Generation (version 1.1)”, and approved by Gold Standard on 13/08/2025 /2//74/.

iii. The project contribution to Environment, Social and Economic development.

iv. The project ongoing financial need is sufficiently justified in the Gold Standard VPA-DD.

v. The monitoring plan is transparent and adequate to support all impacts and claims expected by the project.

vi. The calculation of project emission removals has been carried out in a transparent and conservative manner, so that the total calculated emission removals of 359,749 tCO_2e for the crediting period of 7 years since 01/06/2025 and 51,393 tCO_2e per year are most likely to be achieved within the renewable crediting period.

vii. All claims made by the project associated to its contribution to the SDG are credible and appropriately substantiated with historical and projected data and information.

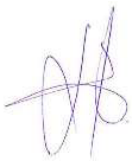
viii. The project meets the stakeholder consultation requirements.

In AENOR´s opinion the project correctly applies and meets the relevant GS4GG requirements for the GS and the relevant host country criteria.

The validation has been performed using a risk-based approach, as described above. The only purpose of this report is its use during the registration process as part of the GS project cycle. Hence, AENOR cannot be held liable by any party for decisions made or not made based on the validation opinion, which would go beyond the purpose.

Madrid, April 7th, 2026.





Richard Daniel Gonzales Toledo
Team Leader

José Luis Fuentes
Climate Change Manager

Appendix 1. Abbreviations

Abbreviations	Full texts
AENOR	AENOR CONFIA S.A.U.
BUS	Biogas User Survey
CAR	Corrective action requests
CDM	Clean development mechansim
CL	Clarification
EF	Emissions factor
ER	Emission reduction
FAR	Forward action request
GHG	Greenhouse gas
GS	Gold Standard
GS4GG	Gold Standard for 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
CP	Crediting Period
MW	Megawatt
N/A	Not applicable
PoA	Programme of activities
PDD	Project Design Document
PP	Project proponent
PRC	Post Registration Change
BKN	Biru Karbon Nusantara
QA/QC	Quality assessment/quality control

SDG	Sustainable development goals
tCO2	Tons of Carbon Dioxide
TJ	Tera Joules
TPDDTECC	Technologies and Practices to Displace Decentralized Thermal Energy Consumption
UNFCCC	United Nations Framework Convention on Climate Change
VER	Verified Emission Reduction(s)
VPA	Voluntary Project Activity
VPA-DD	Voluntary Project Activity design document
VVB	Verification and Validation Bodies
YRE	Yayasan Rumah Energi

Appendix 2. Competence of team members and technical reviewers

CERTIFICATE OF QUALIFICATION

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

Madrid, 07/04/2026

Hereby I confirm the following records of qualification, according with AENOR internal instruction “Processing and carrying out validations/verifications of Greenhouse gas projects” 02-IE-0402, and with regard to the verification process of the above-mentioned programme.

Name: Richard Daniel Gonzales Toledo

GS Team Leader: Yes

GS Validator: N/A

GS Verifier: N/A

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: Validation/verification and Technical Review Team for “Indonesia Domestic Biogas Programme of Activities (IDBP) (GS 1174)”

Madrid, 07/04/2026

Hereby I confirm the following records of qualification, according with AENOR internal instruction “Processing and carrying out validations/verifications of Greenhouse gas projects” 02-IE-0402, and with regard to the verification process of the above-mentioned programme.

Name: José Luis Fuentes

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



Jose Luis Fuentes
Climate Change Manager

Appendix 3. Documents reviewed or referenced

No.	Author	Title	References to the document	Provider
1	PP	20250926 VPA 1 - CP Renewal_PDD_v.2.4	Version 2.4 17/03/2026	PP
2	PP	GS-PoA-DD	Version 1.2 17/03/2026	GS Website
3	GS	Programme of Activity Requirements	Version 3.0	GS Website
4	GS	GS4GG “Template for Key Project Information & VPA Design Document (VPA-DD)”	Version 2.3	GS Website
5	GS	GS Methodology for Animal Manure Management and Biogas use for Thermal Energy Generation	Version 1.1	GS Website
6	PP	VPA 1 ER calculation CP renewal_fNRB changed	16/01/2026	PP
7	PP	BUS_2023_Tabulation_15072024	08/07/2025	PP
8	PP	Drop_off_BUS2023_rev	2023	PP
9	PP	Biogas KPT & Non 2021	2021	PP
10	PP	2024_IDBP_Database_VPA1	08/07/2025	PP
11	PP	Reparation report	-	PP
12	PP	Grievance mechanism	-	PP
13	PP	Labour contracts	2025	PP
14	PP	20180407 KPT December 2017	2017	PP
15	PP	Training reports	-	PP
16	PP	Raw_data_BUS_15072024	2024	PP
17	PP	Evidence of Communication on Change address	2025	PP
18	PP	MOU Hivos-YRE	-	PP
19	GS	Gold Standard for the global Goals, Principles and Requirements	Version 2.1	GS Website
20	GS	Gold Standard for the Global Goals, Community Services Activities Requirements	Version 1.2	GS Website
21	GS	GS4GG Validation and Verification Standard	Version 2.0	GS Website

22	FAO	Global Forest Resources Assessment 2010	2010	FAO Website
23	GS	Requirements for additionality demonstration	Version 1.0	GS Website
26	IPCC	2006 IPCC Guidelines on National GHG Inventories	2006	IPCC
27	GS	Gold Standard for the Global Goals Safeguarding Principles & Requirements	Version 2.1	GS Website
28	UNFCCC	Guideline: Sampling and surveys for CDM project activities and programmes of activities	Version 04.0	UNFCCC Website
29	UNFCCC	Standard Sampling and surveys for CDM project activities and programmes of activities	Version 09.0	UNFCCC Website
30	PP	LIPI Stove Report_Khazanah Bahari	2010	PP
31	PP	LIPI Stove Report_Metalindo	2010	PP
32	PP	[en]_ITTO_2009	2009	PP
33	IPCC	Climate Change 2014 Synthesis Report	2014	IPCC Website
34	PP	User's manual	2022	PP
35	PP	BIOSLURRY APPLICATION_BIOGAS BOOK	2015	PP
36	Biru Biogas Rumah	Indonesia Domestic Biogas Program Annual Report	2019	Rumah Energy Website
37	GS	Template Guide Key Project Information & Programme Design Document (POA-DD)	Version 2.2	GS Website
38	PP	Crosstab BUS by Province_18May2016	2016	PP
39	PP	Baseline_QNaire_2023_ver_4	2023	PP
40	PP	IDBP Employee List	2025	PP
41	PP	20250226 SDG outcomes	2025	PP
42	PP	430_V1.3_IQ_SDG-Impact-tool	Version 1.3	PP
43	PP	agreement Hivos with embassy-RNE	2009	PP
44	PP	MOU HIVOS-YRE_Handover Carbon Fund	2021	PP

45	Dr. Amrit B. Karki	Biogas as Renewable Source of Energy in Nepal Theory and Development	2005	PP
46	PP	CSR Contract YRE PHR	2022	PP
47	PP	CR cost size	2023	PP
48	The World Bank	Pathway Towards Economic Security: Indonesia Poverty Assessment	2023	PP
49	PP	QC reports	2010 - 2016	PP
50	PP	Enumerator Training Photos	2023	PP
51	PP	Enumerator Office Training Attendance List	2022	PP
52	PP	Company Regulation YRE 2023	2023	PP
53	PP	YRE HSE General Guidelines	2023	PP
54	PP	Buku Saku Pencegahan dan Penanganan PMK	2022	PP
55	MDPI	Household Biogas Digester	2012	MDPI Website
56	IEA Bioenergy	Utilisation of digestate from biogas plants as biofertiliser	2010	PP
57	UNFCCC	Methodological tool 33: Default values for common parameters	Version 03.0	UNFCCC Website
58	GS	The Gold Standard Site Visit and Remote Audit Requirements and Procedures	Version 2.0	GS Website
59	FAO	Global Forest Resources Assessment 2020 in Indonesia	2020	FAO Website
60	GS	The Gold Standard for the Global Goals Stakeholder Consultation and Engagement Requirements	Version 2.1	GS Website
61	PP	Previous registered GS VPA-DD	Version 10.1 05/10/2018	GS Website
62	UNFCCC	Guidelines on the Demonstration of Additionality of Small-Scale Project Activity (EB105, Annex 04)	Version 13.1	UNFCCC Website
63	AENOR	VR VPA1 GS1174 2023	Version 1.2	AENOR
64	PP	KPSP-YRE Contract	2023	PP

65	PP	IDBP Ecosystem and Carbon Finance Scheme	2023	PP
66	GS	Validation Verification Body Requirements	Version 3.0	GS Website
67	PP	GS-13 calculation 2023_ver1	2023	PP
68	PP	Three-year guarantee contracts	2012 - 2014	PP
69	PP	BFT samples	2021 - 2022	PP
70	PP	Women on marketing pictures	2023	PP
71	PP	Milk price deduction contracts	2025	PP
72	PP	Manual construction	2014	PP
73	GS	Template Guide Key Project Information & VPA Design Document (VPA DD)	Version 2.3	GS Website
74	GS	Design Change Approval Email - PoA v0.5	13/08/2025	PP
75	UNFCCC	Small-scale CDM programme of activities design document form	Version 1.0	UNFCCC Website
76	UNFCCC	AMS-III.D. - Methane recovery in animal manure management systems	Version 21.0	UNFCCC Website
77	PP	Reconsideration deviation request GS	10/10/2025	PP
78	GS	GS4GG “Template for Key Project Information & Programme Design Document (POA-DD)”	Version 2.2	GS Website
79	GS	GS4GG Transition Requirements	Version 2.0	GS Website
80	GS	RU_2025_fNRB-application-for-GS4GG-certification	Version 1.0	GS Website
81	PP	T-PreReview_V1.1-Cover-Letter_BKN[972]	26/07/2023	PP
82	GS	Email_CME handover approved by GS_13102023	13/10/2023	PP
83	GS	Application of suppressed demand, project type and applicable scale threshold (RU 2020 PR-GHG V1.2)	13/08/2020	GS Website
84	PP	Biogas diffusion among small scale farmers in Indonesia: An application of duration analysis	2019	PP
85	PP	Carbon Credit Cost 2021 - 2023	2026	PP

86	GS	Technologies and Practices to Displace Decentralised Thermal Energy Consumption	Version 4.0	GS Website
87	PP	Biogas Market in Indonesia: The Roles of Carbon Trading	2021	PP
88	Arjun S. Bedi, Robert Sparrow & Luca Tasciotti	The impact of a household biogas programme on energy use and expenditure in East Java	2017	PP
89	PP	12. Carbon Fund Report Dec 2021	2021	PP
90	PP	12. Carbon Fund Report December 2022	2022	PP
91	PP	12. Carbon Fund Report Dec 2023	2023	PP
92	PP	AENOR invoices	2021-2023	PP
93	PP	Biogas subsidies	2021-2023	PP
94	PP	BUS survey payments	2021-2023	PP
95	PP	1_[KAN_Jabung]_Novation_Participation_Agreement_(YRE_-_BKN-_CPO)	27/06/2023	PP
96	PP	11_[KPSP_SETIA_KAWAN]_Novation_Participation_Agreement_(YRE_-_BKN-_CPO)	27/06/2023	PP
97	PP	31_[LPKP]_Novation_Participation_Agreement_(YRE_-_BKN-_CPO)	27/06/2023	PP
98	PP	GL-2021_YRE	16/03/2026	PP
99	PP	GL-2022_YRE	16/03/2026	PP
100	PP	GL-2023_YRE	16/03/2026	PP

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

Corrective Action Requests (CARs)

NC/CAR id.	01	Date: 25/04/2025
NC/CAR description		
The following sections of the PoA & VPA 1 CP renewal PDD have not been completed in accordance with their corresponding GS templates (T-PreReview_v2.2-POA-Design-Document and T-PreReview_v2.3-VPA-Design-Document): 1. "Time of First Submission Date" and "Other Requirements applied" in the cover page are empty. 2. There are some format errors along the VPA-DD: - Format letter of some footnote references is different. - Some boxes to check in the cover page and in the Appendix 1 are different than the rest. - Title number of figures represented in the report. - Double lines on Table 12 of section B.6. 3. Some more detailed information is missing in the following sections: I. Section A.1, about the (1) location of the project activity, (2) technologies/measures to be employed and/or implemented by the project activity and (3) the project boundary, regarding timeframe of this new crediting period and active biodigesters after drop-off among others. II. Section B.3., about present a flow diagram of the project boundary based on the description provided in Technologies and/or measures above (a list of the facilities, systems and equipment that will be installed and/or modified by the project. 4. Source of data for "Project technology description" and "Th_{cap}" parameters of section B.6.2. are empty. In addition, the row of the "Choice of data or Measurement methods and procedures" of the latter parameter, is not clear for the validating team. 5. According to section B.1. of the last PoA-DD v0.4 received from the PP, there are "Other elements of monitoring plan" that shall be described on section B.7.3. of the VPA-DD for VPA-1. 6. Sub-section C.1.1. Start date of project is missing. 7. More detailed information such as diagrams of the grievance process applied by the project is missing on section E.2. 8. Some boxes of Appendix 1 are not filled (see P.6.1.3). 9. Responses of boxes 9.4.1, 9.4.2 and 9.4.3 of Appendix 1 seem not appropriately filled. In addition, second box of 9.8.1 seems not correct, as well as the location of the justification described.		
Project proponent's response		**Date:** 23/06/2025
1. "Time of First Submission Date" and "Other Requirements applied" were filled. 2. The following format errors were corrected: I. Box to check in the cover page and boxes in Appendix 1 II. Figures numbering III. Double line on Table 12 3. Details were added to: I. The location of the project activity and units per province. But as drop-off will vary in each monitoring period and will be monitored annually. Table 4 was included to show installed units per province. II. The project boundary. A flow diagram was included 4. The data source for "Project technology description" and "Th_{cap}" were added. The Choice of data or Measurement methods and procedures" on "Th_{cap}" was rephrased for clarity. 5. We compared the PoA DD with this VPA 1 DD, the monitoring elements are aligned.		

6. Subsection C.1.1. Project start date was added.
7. Diagrams of the three options in the grievance process were added.
8. Box in P.6.1.3 is filled but it is shown in the next page.
9. Boxes of 9.4.1, 9.4.2 and 9.4.3 in Appendix 1 were appropriately filled. In 9.8.1, the project does not involve the risk of negatively influencing access to and availability of food, the justification was removed.

Documentation provided by the project proponent	
VVB's evaluation	**Date:** 30/07/2025

1. "Time of First Submission Date" and "Other Requirements applied" rows of the VPA-DD cover page have been filled appropriately.
2. The format errors indicated have been subsanated in the updated VPA-DD provided by the PP.
3. More detailed information has been added to the VPA-DD. **However, there is still missing information on the VVB request on section A.1. and B.3**.
4. Requests have been corrected. **However, for Th_{cap} parameter, some reference are wrongly indicated in the VPA-DD**.
5. Section B.1. has been updated correctly by the PP.
6. Sub-section C.1.1. has been added correctly in the VPA-DD.
7. More detailed information as diagrams of the grievance process applied by the project have been added on section E.2.
8. All the gaps of Appendix 1 are filled appropriately.
9. Responses of indicated boxes are now aligned with the programme and its PoA-DD.

Car 01 is still open.

Project proponent's response	**Date:** 05/08/2025

3. Further details were added to:
   I. Cross referenced table 5 containing the biodigesters location, figure 3 depicting the project boundary and secition A.3 where further details of the project technology are described. A phrase was added to describe the timeframe of this new crediting period.
   II. The flow diagram of the project boundary was moved to section B.3
4. The cell data source for "Th_{cap}" was corrected.

Documentation provided by the project proponent	
VVB's evaluation	**Date:** 08/08/2025

3. Requested pending information according to the GS VPA-DD template has been added properly on sections A.1. and B.3.

4. References indicated for Th_{cap} parameter in Section B.6.2 has been appropriately modified.

Therefore, CAR 01 is closed.

NC/CAR id.	**02**	**Date: 25/04/2025**
NC/CAR description		

The following errors have been found on the 20250307 VPA 1 - CP Renewal_PDD_v.1:

1. Number of jobs for SDG 8 is not consistent with the supporting documentation provided to the VVB "IDBP Employee List".

2. The maximum output (Th_{cap} parameter) is not exactly consistent between Table 5 and the rest of the PDD (p.11).
3. The total capacity is not exactly consistent between Table 5 and the rest of the PDD (p.11).
4. Reference 5 is not consistent with the value represented for energy available from biogas system (E parameter).
5. Eligibility criteria of applied methodology of Table 8 in Section B.2., are different than the displayed in the methodology applied by the project "433_V1.1_EE_ICS_Methodology-for-Animal-Manure-Management-and-Biogas-Use-for-Thermal-Energy-Generation".
6. Percentage of fuel used for cooking purposes in the baseline for wood by 31 is not exactly consistent with the reference indicated.
7. There are some parameters of equations reported on section B.6.1. missing, for SDG 13.
8. Some values of LPG Indonesian Rupiahs are represented without commas along the PDD.
9. Cell of the Excel file indicated on reference 42 is empty. It is also represented in the SDG outcomes spreadsheet provided (see SDG 1 tab).
10. Cell indicated on reference 47 is not exactly the proper one.
11. The calculation represented for the total average of animals kept per household on section B.6.3 (p.54) is not accurate, contrasted with the corresponding supporting documentation reflected.
12. Percentage reflected for households using LPG as primary fuel source for cooking purposes is not accurate with the reference indicated, determining $P_{b1,fuel,y}$ (p.58).
13. The annual average over the crediting period for SDG 1 reflected in the SDG spreadsheet (tab SDG 1) provided by the Project Participant (PP) is not correct.
14. The source of data represented for "Average usage rate in project scenario p during year y" parameter in section B.7. is not correct.
15. Value applied for $TL_{bio,y}$ parameter (SDG 2) in section B.7. is not exactly consistent with the source of data represented.
16. The crediting period shown of the project is not correct.
17. References 75 and 78 are incorrect.

Project proponent's response	**Date:** 23/06/2025

1. The data source for the number of jobs is "2024_IDBP_Database_VPA1", tab "PLANT MAINTENANCE", cell I43056 as per Section B.7.1 "SDG 8 – Decent work and economic growth: GSDM-I8.3.1"
2. The consistency of the parameter "Th_{cap}" was verified and corrected along the DD.
3. See 2 above.
4. Reference 5 was corrected, it is now consistent with parameter E and the calculation sheet "VPA 1 ER calculation CP renewal" | Tab "Capacity calculation" | Cell C18
5. The elegibility criteria of the "433_V1.1_EE_ICS_Methodology-for-Animal-Manure-Management-and-Biogas-Use-for-Thermal-Energy-Generation" was outlined and applicability was proven for each component.
6. The percentage of fuelwood used for cooking purposes was corrected to be consistent with the source in reference 15.
7. The parameters $VS_{LT,y}$ and $N_{LT,y}$ were described for Equation 7, and all parameters of Equation 9 were described.
8. LPG Indonesian rupiahs format was corrected.
9. Reference 42 was corrected.
10. Reference 47 was corrected.
11. Calculation for $N_{LT,y}$ is consistent with the project documentation and methodology. Only dairy cows are considered for baseline conservativeness and $N_{LT,y}$ isannual average which is different from average animals as it corrects for number of days the animal was alive (Np,y).
12. Percetange of use of LPG was corrected to be consistent with the supporting documentation.
13. Annual average costs savings from reduced fuel consumption and biodigester use are correctly calculated in the spreadsheet. It represents the total savings generated by the project not the

savings per biodigester. Saving per HH as in this SDG 1 sheet is 2966733,17 IDR. Total saving per year under project is hence 2966733,17*20252 = 60082280159 or 60.1 billion (rounded up).

14. The source of data is correct. The value applied was corrected to properly represent it as a percentage.
15. The value applied of "$TL_{bio,y}$" was corrected to be consistent with the data source.
16. Corrected.
17. Referenced 75 and 78 were corrected.

Documentation provided by the project proponent

VVB's evaluation	**Date:** 30/07/2025

1. **It is not clear how in the reference indicated for SDG 08 the value has been calculated. In addition, the audit team requires a correct evidence and clarification on the inconsistency of the provided "IDBP Employee List"**.
2. The parameter is now consistent along the PDD.
3. The parameter is now consistent along the PDD.
4. Requested reference has been modified appropriately and in a consistent manner.
5. **There are some eligibility criterias of the applied methodology missing on table 8 in Section B.2**.
6. Percentage of fuel used for cooking purposes in the baseline for wood has been updated in a consistent manner.
7. All parameters from equations displayed in section B.6.1. are now properly shown.
8. Indicated figures for LPG Indonesian rupiahs format have been corrected by the PP.
9. Indicated reference has been corrected in the PDD, **but not in the latest "20250226 SDG outcomes" Excel file provided by the PP**.
10. **The reference is still incorrect**.
11. The calculation represented for the total average of animals kept per household is now more accurate.
12. The percentage reflected for households using LPG as primary fuel source for cooking purposes is now accurate.
13. **The annual average reflected in the spreadsheet still considers 5 years of the crediting period rather than 7. This way, is not consistent with the GS SDG Tool provided**.
14. The source of data reflected and its corresponding cell is correct.
15. The corresponding value has been properly corrected by the PP.
16. The crediting period of the project has been adequately modified.
17. Indicated reference are correct.

CAR 02 is still open.

Project proponent's response	**Date:** 05/08/2025

1. SDG 8 Impact corrected to 6, as per IDBP Employee list. Value in "2024_IDBP_Database_VPA1", tab "PLANT MAINTENANCE", cell I43056 is masons that are nort long-term contracted. It was counted using the filter names in Column I "PLANT MAINTENACE DONE BY" after filtering by plant maintenance events that occurred in 2023. It is now replaced by a formula for further clarity. But this is not included under SDG 8.

5. The elegibility criteria of the "433_V1.1_EE_ICS_Methodology-for-Animal-Manure-Management-and-Biogas-Use-for-Thermal-Energy-Generation" was outlined and applicability was proven for each component.

9. Reference was corrected in SGD outcomes sheet.

10. Reference is not incorrect. A new version of the sheet is provided to ensure the VVB has the most updated version of the file.

13. Annual average costs savings from reduced fuel consumption and biodigester use are correctly calculated in the spreadsheet. It represents the total savings generated by the project not the savings per biodigester. Saving per HH as in this SDG 1 sheet is 2966733,17 IDR. Total saving per year under project is hence 2966733,17*20252 = 60082280159 or 60.1 billion (rounded up).

Documentation provided by the project proponent	
10. Updated version of “Baseline_QNaire_2023_ver_4”	
VVB’s evaluation	**Date:** 08/08/2025

1. The value for the SDG 8 indicator has been clarified and it is now consistent with the evidence provided to the VVB.

5. All corresponding applicable conditions of the applied “Methodology for Animal Manure Management and Biogas use for Thermal Energy Generation, version 1.1”, are now represented with acceptable and correct justifications.

9. **The PP have not sent to the audit team the corresponding Excel source of data “20250226 SDG outcomes”, where the requested cell was incorrect: cell Z2064 rather than Z264**.

10. The indicated reference (now 57 in the updated PDD), has been corrected properly by the PP.

13. The annual average indicated in the GS SDG Tool is correct**. However, the VVB request is on the “20250226 SDG outcomes” Excel file provided. It is still considering 5 years rather than the corresponding 7 years of the crediting period, being not consistent with the GS SDG Tool, where different value is reflected. Please, check cell D28 of the former source of data**.

CAR 2 is still open.

Project proponent’s response	**Date:** 11/08/2025

9. See documentation provided by the project proponent below.

13. The SDG outcomes sheet includes a quantification over the 7-year period starting on 2025 until 2031, including both years. Tab SDG 1 , Cell D28, calculates the average over the 7-year period, which corresponds to the average value of cells D20:D26.

Documentation provided by the project proponent	
9 & 13. Updated version of “20250226 SDG outcomes”	
VVB’s evaluation	**Date:** 21/08/2025

PP has provided all relevant supporting documentation related to the SGD analysis updated to the VVB, in a consistent manner.

Therefore, CAR can is closed.

Clarifications (CLs)

CL ID	01	Date: 25/04/2025
CL description		
Please provide evidence of the following: 1. Laboratory of Energy and Agricultural Electrification (2002) 'Biomass energy potentials and utilization in Indonesia'. 2. The three-year repair and maintenance guarantee provided upon commissioning. 3. Origin of the 57 quality standards to be fully met by the constructors of the project before a biodigester can be commissioned. 4. Dates 29th December 2021 – 25th January 2022 for the BPT testing executed. 5. Training sessions of the program, that engages staff on the marketing, installation and maintenance of the biodigesters. 6. Evidence of women encouraged to take up roles in marketing. 7. Milk price deduction paid by the cooperative to the user (Section E.1. - p.93). 8. Cooperation with KBSS Setia Kawan. 9. Address contact information of the Project Developer(s) represented on Appendix 2. 10. User's Manual, where biodigesters serial number are registered. 11. Safety and health measures for project workers. 12. Mistreatment that will be treated as an immediate non-conformity (question P.9.9.1 for animal welfare in Appendix 1). 13. Cost of IDR for the average size biodigester implementer under this VPA. 14. Cost of biodigester repairs: 118,688 IDR according to the PP.		
Project proponent's response		**Date:** 23/06/2025
1. Document uploaded: "1. Biomass_Energy_Potentials_And_Utilization_In_Indonesia.pdf" 2. Documents uploaded on folder: "2. Three year guarantee" 3. Document uploaded on folder: "3. QC form of digesters" 4. Document uploaded on folder: "4. BFT 29 Dec 2021 – 25 Jan 2022" 5. Document uploaded on folder: "Training on staff and CPOs" 6. Documents uploaded on folder: "5. Women on marketing role" 7. Documents uploaded on folder: "7. Milk Price deduction". The evidence uploaded for new digester, because all digesters on VPA-1 has completed the repayment. 8. Document uploaded: "8. [KPSP_SETIA_KAWAN]_Novation_Participation_Agreement_(YRE_-_BKN-_CPO).pdf" 9. Document uploaded: "9. Certificate of domicile_BKN.pdf" 10. Documents uploaded: "10. User's manual" 11. Document uploaded: "11. Manual construction.pdf" you can find the measure on page 35. 12. We provide user manual for Farmer how to treat dairy cattle and prevention of Foot and Mouth Disease. Documents uploaded on folder: "12. Animal welfare". 13. Documents uploaded: "13. Completion report_BAP.pdf". 14. Cost of 118,688 IDR for biodigester repairs is the average cost incurred by a user in a year.		
Documentation provided by the project proponent		
VVB's evaluation		**Date:** 30/07/2025
1. Ok. 2. Several requested evidence provided. 3. Several requested evidence provided with the 57 quality standard questionnaire.		

4. Several requested evidence provided for the requested survey on the reflected period.
5. Several evidence provided on training sessions by the programme.
6. Ok.
7. Several agreements in rule about milk price deduction provided by the PP.
8. Corresponding contract provided. The audit team verified it and deems it correct. **However, the name of the company indicated seems to be KPSP Setia Kwan, instead of KBSS. Clarify**.
9. The evidence provided by the PP corrobored the address reflected in the Appendix 2 of the PDD.
10. Ok.
11. Ok.
12. Ok.
13. Cost indicated checked in the evidence provided.
14. The VVB has been able to assess the calculation cost through the references reported in the PDD updated, on the BUS 2023 Tabulation spreadsheet.

CL 01 is still pending to be closed.

Project proponent's response	**Date:** 05/08/2025
8. It is KPSP and is now corrected in the PDD.	
Documentation provided by the project proponent	
VVB's evaluation	**Date:** 08/08/2025
8. The error has been updated correctly in the PDD. **CL 01 can be closed**.	

CL ID	**02**	**Date: 25/04/2025**
CL description		

Clarification of the following points of the VPA 1 CP renewal PDD is required:

1. The calculation related to "footnote 7" shown on page 11 has not been identified in the corresponding source of data by the audit team.
2. For parameter "V_b = volume of biogas" by 1.80m^3/day, values of its calculation have not been found in the specified pages of the source of data indicated. In addition, the source is 20 years old and the VVB requires confirmation on availability of other more up-to-date source of data.
3. Full name of the acronyms "CSR", "BFT" and "MCC" are not displayed.
4. A written declaration of IDBP's non-use of ODA issued and submitted to the Gold Standard Foundation, has not been found attached to the annex of the PDD, as reported on section A.5.
5. It seems there are methodologies and tools missing on Section B.1: "Gold Standard for the Global Goals Community Services Activity Requirements (version 1.2)" and "Methodological Tool: Demonstration of Additionality of Small-scale Project Activities (version 13.1)".
6. Why the project applies the "Standard for sampling and surveys for CDM project activities and programme of activities (version 3.0)", rather than the latest version available. The same way for reference 67 "AMS-I.E.: Switch from non-renewable biomass for thermal applications by the user (Version 04)", to determine fraction of NRB formula.
7. How the three-year repair and maintenance guarantee upon commissioning and the increasing household's understanding and acceptance of the new technology is being managed by the project nowadays, since there are no more installations since 2017.
8. If the following sources of data are the most updated available:
   - Reference 29 on Policy – Stakeholder Engagement of 'Indonesia Domestic Biogas Program 2019 Annual Report'.

- Indonesia value from the State of the Global Clean and Improved Cooking Sector, world bank 2015, for $T_{b,y}$ parameter on section B.6.2.

9. Why description of “Baseline scenario survey results” on section B.6.2. is not displayed.
10. If the baseline survey covering the target household population was conducted in April of year 2023 or 2024 (p.53).
11. Why table of SDG 8 is not represented on section B.6.4.
12. It seems row of “Measurement methods and procedures” description filled, for “Avoidance of double counting or double claiming among project technology end users” parameter on section B.7, corresponds to the “Monitoring frequency” below.
13. How PP monitor leakages in the project, procedure and reporting.
14. Why the address contact information shown in Appendix 2 is different than the represented on for the renewal validation process for VPA-2 with AENOR. Wheater this information has been communicated to Gold Standard (GS) or not.

Project proponent’s response	**Date:** 23/06/2025

1. It was footnote 4, it was corrected in the text
2. The data source was updated. The footnote was updated to refer to the cell were the calculation is performed.
3. The acronyms were properly introduced in their first use in the DD.
4. See “Documentation provided by the project proponent” below
5. The methodological tools and requirements list in B2 was updated.
6. The latest version of the standard and methodology are used, the text was updated to reflect it.
7. In 2018 – 2019 the program did inspection to 16,000s biodigester to check the condition of the digester, to ensure the biodigester were used by the household. And since 2020 the program does the reparation for digesters that were built more than 3 years ago. On average, 100 units every year has been repaired by the program. The data of biodigester that need to be repaired also comes from Biogas User Survey data.
8. The following source of data was updated:
   - Reference 29 (now 30) includes IDBP 2022 Annual report
   - State of the Global Clean and Improved Cooking Sector, World Bank 2015 is the most updated source for Indonesia
9. Baseline scenario survey results is not part of what should be described in section B.6.2 as per the VPA-DD template.
10. It was 2023, clarified in the text.
11. SDG 8 was included in the B.6.4 Section
12. The text was moved to the monitoring frequency and a description of the measurement methods and procedures was written.
13. Leakage monitoring is described in Section B.7. under the subsection “Parameters related to Thermal energy application”
14. PT. BKN just moved to a new building in January 2025. We just communicate it to the Gold Standard.

Documentation provided by the project proponent
4. Written declaration from Hivos to GS (IDBP Non use ODA issued).pdf

VVB’s evaluation	**Date:** 30/07/2025

1. Indicated reference corrected in the updated PDD in a consistent manner.
2. Indicated reference corrected in the updated PDD in a consistent manner.
3. Acronyms developed adecquately in the updated PDD.
4. Indicated evidence provided by the PP. **Although it is correct, the VVB has not identified it in the annex of the PDD**.
5. Section B.1. has been updated appropriately.

6. The latest versions of the indicated standards have been updated. **However, the "Standard for sampling and surveys for CDM project activities and programme of activities (version 3.0)" has not been updated on section B.7.2**.
7. In that case, **are all malfunctioning biodigester systems repaired by the programme? What are the exact requirements for IDBP to repair the installations? Please clarify**.
8. Issue clarified and the corresponding reference to the IDBP annual report has been provided and updated correctly.
9. The "Baseline scenario survey results" parameter description has been added on section B.6.2. of the updated PDD properly.
10. **Contrary to the PP response, the year of the survey has been incorrectly modified**.
11. Corresponding SDG has been properly added on section B.6.4. of the PDD.
12. Misplacement of the indicated rows have been ordered correctly by the PP.
13. The issue has been sufficiently clarified.
14. Although this data has been reviewed by the audit team, **evidence of the communication with GS is required.**

As there are still some issues pending to be closed, CL 02 is open.

Project proponent's response	**Date:** 05/08/2025

4. Phrasing was changed in the PDD, since the document is not in a annex of the PDD but attached to it as supporting documentation.

6. Version 9 of "Standard for sampling and surveys for CDM project activities and programme of activities" has been updated in section B.7.2.

7. Not all malfunctioning digesters are repaired by the IDBP. Not all malfunctioning biodigester systems repaired by IDBP. However, to maintain the sustainability of the digesters — which is also a concern of the buyers (beside the installation of new biodigesters) — IDBP allocates a portion of the carbon funds to repair biodigesters that have been in use for more than three years since installation. The process of repairs is described in the PDD section E.. Grievance Mechanism.

10. Baseline survey was conducted in April 2023, it is now corrected and consistency verified thought the document.

Documentation provided by the project proponent

14. Evidence of communication.pdf has been shared in the folder with other evidences.

VVB's evaluation	**Date:** 08/08/2025

4. The indicated phrase in the PDD has been correctly modified.

6. **The indicated version is still incorrect in the PDD sent by the PP**.

7. The clarification request provided by the PP is considered understandable and sufficient by the VVB.

10. **Clarify if the BFT executed in the period of 2 April 2024 reflected on Section B.6.1, page 36 of the PDD, is correct**.

14. Corresponding evidence of the GS communication requested has been provided by the PP and the audit team deems it is correct.

Pending to close few issues, CL 02 is still open.

Project proponent's response	**Date:** 11/08/2025

6. Version 9 of "Standard for sampling and surveys for CDM project activities and programme of activities" has been updated in section B.7.2.

10. Yes, the BFT was conducted 29 December 2023 and 2 April 2024.

Documentation provided by the project proponent

14. Evidence of communication.pdf has been shared in the folder with other evidences.
VVB's evaluation | **Date:** 21/08/2025
Pending issues have been appropriately modified by the PP in the updated PDD provided. **CL 02 can be closed**.

CL ID	**03**	**Date: 25/04/2025**
CL description		

The following sections of the VPA 1 CP renewal PDD miss more detailed information, references, or references corrections:

1. References of the following:
   I. Indonesian Government standard on stove efficiency (Table 5).
   II. Baseline survey in the introduction of section B.4.
   III. Source of data of some parameters related to Thermal application on section B.6.2. Also, some additional comments can be added regarding method 1 and/or 2 for the applicability of some Thermal parameters.
   IV. Value represented for column "Average number of cows ($N_{LT,y}$)" of Table 16.
   V. 39 samples of non-biogas household residing close to the biogas participants of the BFT executed.
   VI. Calculations displayed for calculating $SE_{b,y,CO2}$ parameter, baseline emissions from Thermal application and total baseline emissions on section B.6.3.
   VII. Table represented for SDG 13 on section B.6.4.
   VIII. Baseline survey as source of data for $N_{da,y}$ parameter on section B.7.
2. "Annex" of the paragraph 1.1.3 indicated on section B.5. is missing, for the GS Community Services Activity Requirements (version 1.2).
3. More information should be described at the end of Section B.5 about documentation of the barriers represented required or not, as according to point 2 of the methodology "Guidelines on the Demonstration of Additionality of Small-Scale Project activities (EB 68 Annex 27), V09.0" and paragraph 1.1.3 of Annex B of "Community Services Activity Requirements (Version 1.2)": Project belongs to "Project activities solely composed of isolated units where the users of the technology/measure are households or communities or institutions and where each unit results in <= 600 MWh of energy savings per year or <=600 tonnes of emission reductions per year" in the positive list referenced in the methodologies".
4. More detailed information about the origin of the program's financial funds on section B.5.2.
5. Titles for SDG outcomes of section B.6.1. are missing.
6. Specify corresponding tab and cells of the ER spreadsheet reference 58.
7. Specify page(s) of the FAO source of data added as references along the PDD.
8. Indicate corresponding tab and cells of the IDBP database source of data for "Avoidance of double counting or double claiming among project technology end users" parameter on section B.7. Also, convenient to add cells of the "Baseline_QNaire_2023_ver_4" source of data shown for $N_{LT,y}$ parameter.

Project proponent's response	**Date:** 23/06/2025

1. The following references were provided:
   I. Uploaded as a separate document in the Drop Box folder: Indonesian Government standard on stove efficiency.
   II. A brief introduction to the baseline survey and its design was written under B.4.
   III. Parameters relevant for thermal application method 2 were added to section B.6.2, additional comments on applicability were added.

IV. Reference 58: Average number of cows.
V. The error was corrected and reference added.
VI. References 70, 71 and 72 were added to reference to the calculation sheet.
VII. Reference 88 was added to reference the calculation sheet.
VIII. Source of data was updated to include the reference to the calculation sheet.

2. Annex of paragraph 1.1.3 of CSA Requirements.
3. The project belonging to the positive list was added in Table 10. More information on the barriers is provided in section B.5.2.
4. Section B.5.2 was updated to reflect that the whole program's financial funds come from carbon revenue.
5. Titles of SDG outcomes were added in section B.6.1.
6. Reference 58 (now 59) was updated to include the cell where the calculation is performed.
7. Page numbers are now added to references.
8. The corresponsing tab and cells were added for "Avoidance of double counting or double claiming among project technology end users" and "$N_{LT,}$" parameters.

Documentation provided by the project proponent

VVB's evaluation	**Date:** 30/07/2025

1. All references requested have been addressed and modified properly when required by the PP. **However, for issue IV, clarify why the average number of cows is 3.603 rather than 3.605, as refected in the ER spreadsheet.**
2. Request added appropriately in the updated PDD.
3. Detailed information has been updated on section B.5. of the PDD and the VVB deems it acceptable.
4. Issue clarified and section B.5.2. of the PDD updated accordingly.
5. Titles of SDG outcomes were added properly in section B.6.1.
6. Reference updated and represented data on it validated by the VVB.
7. Indicated reference developed correctly.
8. Issue completely addressed by the PP, with propert detailed information.

CL 03 is still open.

Project proponent's response	**Date:** 05/08/2025

1. The following references were provided:

   IV. The typo was corrected.

Documentation provided by the project proponent

VVB's evaluation	**Date:** 08/08/2025

1. The value has been modified and it is now consistent with the source of data provided and referenced in the PDD.

Therefore, CL 03 is closed.