



IMPROVED COOKING STOVE PROGRAMME IN BURUNDI



Earthood Services Private Limited.

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Summary:

Brief description of the verification and the project

Earthood Services Private Limited (hereafter referred to as Earthood) has been contracted by AERA group SAS to conduct the verification of the registered grouped project (VCS 2828) – “Improved Cooking Stove Programme in Burundi”, with regards to relevant requirements of VCS programme guidelines and standard (VCS Standard version 4.5/6/ and VCS Programme Guide version 4.4/7/). The project activity involves distribution of high efficiency ICS by replacing the baseline inefficient wood stoves in the households of Burundi to reduce the consumption and combustion of wood fuel more efficiently, thereby reducing CO₂ emission compared to the baseline. The project is a voluntary initiative as the host country’s laws do not mandate the distribution of improved cookstoves (ICS) to the local communities.

Initially undertaken as CDM PoA 10474 “Improved Cooking Stove Programme in Burundi supported by Republic of Korea”, The project activity requested the following CERs under CDM/14/:

- Monitoring report: 10 Sep 2019 - 15 Sep 2019 | CERs requested: 826
- Monitoring report: 16 Sep 2019 - 30 Apr 2020 | CERs requested: 81 469
- Monitoring report: 01 May 2020 - 31 Dec 2020 | CERs requested: 183 191

During the gap validation along with the fourth verification of the project under VCS, the following VCUs were requested/5/:

- Monitoring report: 01 January 2021- 31 March 2022 | VCUs requested: 632 878

In the current and fifth verification conducted for this project, actual emission reductions from the monitoring period, 01-April-2022 to 31-December-2022, were calculated as 458,281 tCO₂ with a total distribution of 290,050 cookstoves

Purpose and scope of verification

The objective of the verification is to perform a complete and independent review of the registered grouped project activity against the applicable VCS requirements and monitoring methodology AMS-II.G v10.0/08/, including the compliance with the registered monitoring plan. The verification is the periodic independent review and ex post determination by Earthood of the monitored reductions in GHG emissions that have occurred as a result of the registered VCS project activity during a defined monitoring period. The verification scope includes an independent and objective examination of the monitoring report. The MR is evaluated in light of the applicable criteria and decisions made by the VCS, including the approved baseline and monitoring methodology and registered VCS Joint PDMR. The verification was conducted in accordance with the VCS standard, Version 4.5/01/, the VCS programme guide Version 4.4/02/ as well as a review of the registered PDMR/03/, Final Joint Validation- Verification report/08/ and monitoring methodology AMS-II.G: "Energy efficiency measures in thermal applications of non-renewable biomass v.10/08/.

Method and criteria of verification

The verification process, which was conducted following Earthood's internal quality procedures, consisted of the following phases:

1. Document review, involving:
 - i. Review of data and information
 - ii. Cross checks between the information provided in the monitoring report and information from sources using all available resources and supportive evidence provided by the project proponent.
2. On-Site assessment, involving:
 - i. Evaluation of the registered VCS project activity's implementation and operation in accordance with the registered VCS Joint PDMR/1/.
 - ii. Evaluation of information flows for creating, collecting and reporting monitored parameters.
 - iii. Interviews with relevant stakeholders to ensure that the operating data collection procedures in the monitoring period are carried out in accordance with the registered monitoring plan.
 - iv. Cross-referencing information from the monitoring report with data from other sources such as project database, monitoring survey sheets and other comparable sources.
 - v. Examination of calculations and assumptions used to determine GHG data and emission reduction.
 - vi. Identification of control and quality systems in place to avoid or detect and remedy any errors or omissions in the provided monitored parameters.

3. Drafting of the final verification report and opinion as well as the resolution of any difficulties.

The number of findings raised during verification

A risk-based approach has been followed to perform this verification and there are no uncertainties associated with this verification. During the current verification, a total of 08 findings were raised, which includes 05 Corrective Action request (CARs), 00 Forward Action request (FARs) and 03 Clarification request (CLs).

The project proponent has successfully resolved all raised issues.

Any uncertainties associated with the verification

The VCS MR v1.8 /3/, emissions reduction calculations/05/, and accompanying documents provided are all in compliance with VCS criteria. The verification was completed with a reasonable level of assurance and no uncertainties were found related with the project activity verification.

Summary of verification opinion

Earthood certifies that the project is implemented in accordance with the registered VCS Joint PDMR/1/ and the applied baseline and monitoring methodology/8/. The project implementation is in line with the information provided in the final Monitoring Report v1.8/3/. The monitoring procedures are inline with the monitoring methodology and the emission reductions achieved during the current monitoring period are calculated without material misstatements. VVB's verification approach is based on the understanding of the risks associated with reporting of GHG emission data and the controls in place to mitigate these. Earthood planned and performed the verification by obtaining evidence and other information and explanations that Earthood considered necessary to give reasonable assurance that reported GHG emission reductions are fairly stated. Based on the information evaluated we confirm that the emission reductions from the grouped project activity, "Improved Cooking Stove Programme in Burundi" during the monitoring period 01/04/2022 to 31/12/2022 amounts to 458,281 tCO_{2e}.

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1 INTRODUCTION

1.1 Objective

AERA Group SAS has contracted Earthood Services Private Limited (VVB) for verification services of the VCS Project “Improved Cooking Stove Programme in Burundi (Project ID 2828) located within the geographical boundary of the rural and peri-urban areas of the whole of Republic of Burundi to carry out the verification of the project against the relevant requirements of VCS Standard v4.5./6/ The verification team has reviewed the GHG data collected for the monitoring period 01-April- 2022 to 31-December-2022 covered in this verification under the crediting period 02-November-2018 to 01-November-2025.

The purpose of the verification is to review the monitoring results and verify that monitoring methodology was implemented according to the registered monitoring plan and monitoring data, used to confirm the reductions in anthropogenic emissions by sources is sufficient, definitive, and presented in a concise and transparent manner. In order to establish that the grouped project activity has been implemented in line with registered design and conservative assumptions, as documented, the monitoring plan, monitoring report, and the project's compliance with applicable VCS, and host party requirements are specifically verified. This verification is a thorough and independent assessment of the registered project activity against the applicable VCS requirements by the VVB. The verification process shall determine whether registered project activity complies with the requirement of the latest VCS guidelines, applicability conditions of the monitoring methodology, relevant host country regulations and guidance issued by the VCS Board.

1.2 Scope and Criteria

The scope of this verification is to assess the claims and assumptions made in the VCS monitoring report/3/ against the VCS criteria, including but not limited to, VCS standard V4.5 /6/ applied methodology/8/ and other relevant rules and requirements established for VCS project activities.

- To verify the project implementation and operation with respect to the registered VCS Joint PDMR.
- To verify the implemented monitoring plan with the registered VCS Joint PDMR and applied baseline and monitoring methodology.
- To verify that the actual monitoring systems and procedures are in compliance with the monitoring systems and procedures described in the registered monitoring plan.
- To evaluate the GHG emission reduction data and express a conclusion with a reasonable level of assurance about whether the reported GHG emission reduction data is free from material misstatement. To verify that reported GHG emission data is sufficiently supported by evidence.

The verification is not meant to provide any consulting towards the project participants. However, stated requested for clarification and/or correction actions requested may have provided inputs for improvement of the project design. The verification shall ensure that the reported emission reductions are complete and accurate in order to be certified.

1.3 Level of Assurance

☒ Reasonable level of assurance

☐ limited level of assurance

The verification process entails a thorough and independent review of the final MR v1.8/3/ against the registered VCS Joint PD&MR /1/ and additional supportive evidence including the baseline and monitoring methodology, subsequent background information. Monitoring plan, follow-up interviews and documentation provided to the VVB against VCS criteria (VCS Program guide v4.4/7/ and VCS Standard v4.5/6/)

A draft verification report prepared by assessment team is reviewed by an independent technical review team (one or more members) to confirm if the internal procedures established and implemented by Earthood are duly complied with and such opinion/conclusion is reached in an objective manner that complies with the applicable VCS requirements as appropriate. The technical review team is collectively required to possess the technical expertise of all the technical area/sectoral scope the project activity relates to. All team members of technical review team are independent of the verification team. The report approved by Technical Manager is endorsed by Managing Director, who is overall responsible to ensure quality, before final release. The further details of applicable procedures and responsibilities about Earthood Quality Management System (QMS) are available on its website (www.earthood.in).

Earthood's verification approach is based on the understanding of the risks associated with reporting of GHG emission data and the controls in place to mitigate these. Earthood planned and performed the verification by obtaining evidence and other information and explanations that Earthood considers necessary to give reasonable level of assurance that reported estimated GHG emission reductions are fairly stated.

In our opinion the estimated and actual GHG emissions reductions were calculated correctly on the basis of the relevant applied methodology, AMS-II.G: Energy efficiency measures in thermal applications of non-renewable biomass v.10/08/.The assessment result has met a reasonable level of assurance in verification that GHG assertions are free of material errors, omissions and misrepresentations.

The assessment result has a reasonable level of assurance in verification that GHG assertions are free of material errors, omissions, and misrepresentations. The documents reviewed are included under Appendix II of this report.

1.4 Summary Description of the Project

The grouped project activity, “Improved Cooking Stove Programme in Burundi” entails distribution and installation of Improved Cookstoves (ICS) to households in rural and peri-urban areas of the whole Republic of Burundi. The project activity involves replacing the inefficient baseline wood stoves in order to reduce consumption of fuel and lead to an increase in the combustion efficiency, thereby reducing CO₂. In accordance with the registered VCS Joint PDMR/1/, the project is a grouped project and new instances will be added in the future with ICS disseminated only in Burundi, following the criteria mentioned in the VCS Standard v4.5/6/ The first instance of the grouped project distributes ICS in the households of Burundi.

The project activity is estimated to disseminating nearly 500,000 ICS, replacing the 3-stone firewood stoves resulting in emission reductions worth 506,373 tCO₂e per year and 3,544,611 tCO₂e during the entire crediting period of 7 years. The start date of the project activity is 02/11/2018 which is the date of the first ICS emission reduction, verified from the ICS sales agreement/23/. The stove is available in entry cost levels via a stand-alone ceramic model that can whether be installed in a fixed hearth within the kitchen (fixed model) of their home or as a metal (mobile model) cladded version. For this project, only the fixed model is installed inside the beneficiaries’ households. The technical specifications of the ICS were confirmed from the same;

Model	Matawi
Weight	5.1 kg (stand-alone)
Efficiency	31.2% (new)
Type of fuel	Wood/Charcoal
Height x Width	23 x 26 cm
Recommended pots diameter	12 inches
Durability	Approx. 8 years

The project activity is undergoing fifth verification (second verification under VCS) and seeks to reduce greenhouse gas emissions, conserve forests for climate change mitigation in a sustainable manner, create job opportunities, and enhance the health of ICS end-users by improving indoor air quality and reducing the labour involved in cooking.

The first project instance has been implemented in Burundi and since the start date of the project activity 290,050 ICS have been distributed to end-users in the households of Burundi. During the current monitoring period spanning from 01-April-2022 to 31-December-2022, 10,438 cookstoves have been distributed to households/12/ leading to a total emission reduction of are 458,281 tCO₂e/4/

Year	Number of stoves distributed
2018	15,347
2019	40,840
2020	91,027

2021	98,929
2022	43,907
Total	290,050

Based on the assessment of the VCS MR/3/, ER sheet/04/, supporting evidence and the on site audit conducted on 08/08/2023 the assessment team can confirm that the project activity is fully functional and implemented as described in the registered VCS Joint PDMR/1/ and the baseline and monitoring methodology/8/.

2 VERIFICATION PROCESS

The registered VCS project is undergoing fifth verification, the approach adopted to ensure the quality of emissions reductions is described in the following sections.

2.1 Method and Criteria

The verification of the project consists of following steps:

Desk review

- Review of data and information provided in the Joint VCS PDMR/1/ & MR/3/ and corresponding annexures.
- Cross check the information with the sources without limitations to the information provided by the project proponents.

Follow up actions

- On-site inspection to physically inspect the project design including, but not limited to, monitoring mechanism.
- Interviews with relevant personnel and end-users responsible for information given in the MR.

Reporting of findings

- Resolution of findings
- Draft verification report

Independent technical review

The project documentation is reviewed by internal technical reviewer in order to independently confirm whether the applicable GHG program requirements were objectively met or not, in addition to whether internal procedures were followed while arriving at the verification opinion. The technical reviewer may accept or reject the verification opinion prepared by the assessment team and gives the reasons. The resolved findings may be opened at this stage or new findings may be identified that are required to be addressed by assessment team and/or project proponents, as appropriate. The technical reviewer is the

decision maker on behalf of the Earthood Services Private Limited. A positive opinion is issued if all the findings have been satisfactorily resolved and in all other cases a negative opinion is issued unless the contract is terminated by either party before reaching the final opinion.

Earthood keeps all documents and records in a secure and retrievable manner for at least two years after the end of the project crediting period.

Sampling plan for verification of the project

There are 290,050 ICS installed by the end of the current monitoring period/12/ and thus for the applicable monitoring parameters, the PP has applied CDM Sampling standard “Sampling and Surveys for CDM Project Activities and Programme of Activities” v09/11/ for determining the sample size to achieve 90/10 confidence precision. A monitoring survey was done by the PP/10/ with consideration of random samples as per the sampling plan mentioned in the registered VCS joint PDMR/1/.

Thus, in line with Sampling and surveys for CDM project activities and programmes of activities (Version 9.0)/14/ which states under paragraph 28 that “When the project participants or the coordinating/managing entity have applied a sampling approach, the VVB may apply acceptance sampling as described in the steps indicated in paragraphs 29–38 below as part of validation/verification activities”, the verification team applied the Acceptance Sampling approach for the on-site audit as part of the verification to substantiate the results of the PP’s monitoring sampling survey.

As per para 39 of the sampling standard version 9.0/11/, “A VVB may select a different sample size than the one indicated in paragraph 32 above either by choosing a different value for the consumer risk and producer risk (e.g., 20 per cent for the consumer risk) when applying acceptance sampling or by using another approach, if any of the following conditions apply:

- a. The estimated volume of annual GHG emission reductions of the project activity or the PoA being verified is equal to or less than 100,000 tCO₂e.
- b. The security conditions in the project region prevents inspection of many samples (eg. conflict zones);
or
- c. The project activity or the PoA is located in a least developed country or a host party with 10 or fewer registered CDM project activities at the end of the monitoring period being verified.”

The project activity is in Burundi which is an LDC. (<https://unfccc.int/topics/resilience/workstreams/national-adaptation-programmes-of-action/lcd-country-information>).

Document review of project information including project design in PD, monitoring survey details provided by PP, Validation report, previous verification was done and based on its own professional judgement AQL of 0.5 and UQL of 20% was selected. The Producer Risk and Consumer risk are assumed to be 10% each. Acceptance number taken for the sample size is 0

The verification team selected random samples of PP’s sampled records to check the acceptability (or otherwise) of the data for each such record with PP’s sample records and determined if the PP’s sample records meet the requirements.

Sample Size:

AQL	UQL	Producer Risk	Consumer Risk	Sample Size; Min	Acceptance No.
0.5%	20%	10%	20%	8	0

The verification team covered a total of 8 samples. The samples to be surveyed by assessment team were randomly selected from the list of monitored samples using the random sample generator on Microsoft excel. VVB has picked 8 samples from the sampling frames with 3 households extra as backup for the purpose of onsite inspection to check the acceptability of PP's sampling results or otherwise. The verification team observed that the sampling survey results of the PP for all the stoves checked were found to be consistent with VVB's survey results. The sampling method used is in line with Standard: Sampling and surveys for CDM project activities and programme of activities/11/

No discrepancies were observed.

2.2 Document Review

This verification of the project is performed primarily as a document review of the final MR v1.8/3/ and associated documents as stated in detail in appendix II of this report.

The verification is performed as a document review of the documents submitted at various stages of assessments and onsite audit by the VVB. Earthood conducted a desk review as under.

- A review of the data and information presented to verify their completeness.
- A review of the monitoring methodology including applicable tools and , where applicable, the applied standardized baseline..
- An evaluation of the data management, quality assurance and quality control system in the context of their influence on the generation and reporting of emission reductions.

2.3 Interviews

In accordance with VCS standard, version 4.5/06/, para 4.1.9 "A site visit that includes a visit to facilities and/or project areas shall be conducted at validation. Such a site visit shall be conducted at verification under the following circumstances:

- The first verification of the project after validation
- Verification of project baseline reassessments; and
- Verifications that assess a project description deviation where the deviation impacts the applicability of the methodology, additionality or the appropriateness of the baseline scenario"

The assessment team carried out an onsite audit during this verification to verify and cross-check the information included in the project documentation and to gain additional information regarding the compliance of the project with the registered monitoring plan and requirement of the applied methodology.

The on-site inspection and interviews for the project location by the assessment team was conducted on 08/08/2023 /09/. During the on-site audit, the interviews of the field personnel (Surveyors – Enumerators) were also conducted to verify the details regarding the survey techniques and the processes involved in the monitoring survey data collection. The information for the same can be found below.

S. No.	Name	Organization	Date of interview	Topic covered	Team Member
1.	JOE Jokhanan	AERA Group	08/08/2023	- Project Design and implementation status - Monitoring system, - Roles and responsibility - Procedure for monitoring data collection - Robustness and accuracy of data collection and transfer - QA/QC procedures & training conducted - Criteria and compliance of new instances added during MP - Ongoing grievance mechanism	Vishnu Panicker and Niyonzima Stanislas
2.	Ndizeye Claver	OBEN EAC POWA			
3.	Rwemera Pascal	OBEN EAC POWA			
4.	Ruimera Jephil	OBEN EAC POWA			
5.	Sumiye Loic	OBEN EAC POWA			

2.4 Site Visits

As already discussed in the above section, physical site is done for the current verification in line with para 4.1.9 of the VCS standard, version 4.5/06/ An on-site was undertaken by the assessment team on 08/08/2023 to carry out the following:

- An assessment of the implementation and operation of the registered project activity as per registered VCS PD MR/01/.
- A review of information flows for generation, aggregation and reporting of the monitoring parameters.
- Interview with relevant personnel to determine whether the operational and data collection procedures are implemented in accordance with the registered monitoring plan in the registered VCS PD MR/01/.
- A cross check between information provided in the monitoring report and data from other sources such as monitoring survey forms, monitoring survey results spreadsheets, technical specifications, or similar data sources.
- A review of calculation and assumptions made in determining the GHG data and emission reduction/4/

- Relevant QA/QC procedure were checked to prevent, identify, and correct, any error in the reported monitoring parameters.

For cross-checking of the monitoring survey results/10/, in line with standard for 'Sampling and Surveys for CDM Project Activities and Programmes of Activities' v09.0/11/, the assessment team visited 08 beneficiaries in Burundi. The interviews with the project beneficiaries were conducted with help of translator/interpreter to overcome the language barrier.

The end users interviewed, and the topics covered during the onsite audit is given in the table below.

S.No.	Name of the end user	Date of Interview	Topics covered	Team Member
1.	Miyingejeje Seaire	08/08/2023	Verification of the participation in monitoring survey	Vishnu Panicker and Niyonzima
2.	Niyomkuru Lailati		Verification of the survey answers and results provided by PP.	
3.	Siniremera Emilienne		Operation and usage of ICS	
4.	Mindonera Emmanueline		Feedback on the ICS installed.	
5.	Itangiteka Bella		Training and Ongoing support provided by PP for operation of project ICS	
6.	Sinzobakwira Fatima		Date of Installation and model and serial number of installed ICS	
7.	Nshimirimana Amani		Number of ICS owned by household	
8.	Nibaruta Richard		Type of fuel used in ICS Social and Environmental benefits from the project activity Cooking practices prior to the installation of project activity ICS (i.e., baseline usage)	

Through the onsite interviews conducted by the verification team and comparing them with the evidence and surveys conducted by the PP, the assessment team confirms that the project has been implemented in line with the registered VCS PD MR/1/. There is no change in the registered monitoring and operational plan.

2.5 Resolution of Findings

The objective of the step is to identify, discuss, and conclude on the issues related to the monitoring, implementation and operations of the registered project activity that could impair the capacity of the registered project activity to achieve emission reductions or influence the monitoring and reporting of emission reductions. This is done based on the desk review and on-site assessment. The verification team prepares and/or updates a verification protocol (internal document) that records the conformities and nonconformities, which may be of following types:

CAR (Corrective Action Request) is raised if one of the following occurs:

- Non-compliance with the monitoring plan, the applied methodology or the standardized baseline are found in monitoring and reporting and has not been sufficiently documented by the project participants, or if the evidence provided to prove conformity is insufficient.

- Modifications to the implementation, operation and monitoring of the registered project activity has not been sufficiently documented by the project participants.
- Mistakes have been made in applying assumptions, data or calculations of emission reductions that will impact the quantity of emission reductions.
- Changes to the key sustainable development indicators.
- Issues identified in a FAR during validation to be verified during verification or previous verification(s) have not been resolved by the project participants.

Clarification request (CL) is raised if information is insufficient or not clear enough to determine whether the applicable requirements have been met.

Forward Action Request (FAR) is raised during verification if the monitoring and reporting require attention and/or adjustment for the next verification period.

All CARs and CLs raised by the Earthood during verification shall be resolved prior to submitting a request for issuance. All the findings that are raised and communicated to project participant during the verification are included under Appendix III. The section also includes the responses by the project participants and an assessment by the verification team if it was closed out or otherwise.

In summary, the type and total number of findings that were raised are indicated below.

Types of Findings	CAR	CL	FAR
Total Findings	07	03	00

All the findings were raised during the verification of the project are included under Appendix III of this report.

2.5.1 Forward Action Requests

The project activity is undergoing *the second* verification in VCS. No FAR was raised during the current monitoring period. There are also no open FARs from the registered Joint PDMR/01/ that are to be addressed for the current monitoring period. Details of the same can be checked from Appendix III of this verification report.

2.6 Eligibility for Validation Activities

This section is not applicable for present verification as Earthood hold the accreditation for the validation of project under sectoral scope 03.

3 VALIDATION FINDINGS.

3.1 Participation under Other GHG Programs

The project has been registered as a CPA-1 in Clean Development Mechanism (CDM) of UNFCCC, under Kyoto Protocol under the PoA 10474 titled, “Improved Cooking Stove Programme in Burundi supported by Republic of Korea” CDM PoA Registration Number: 10474

Weblink:

https://cdm.unfccc.int/ProgrammeOfActivities/poa_db/U2ZYTf1EWXPBHK0069GCLNSDRIQ78A/view

CPA Reference Number: 10474-P1-0001- CP1

Weblink:

https://cdm.unfccc.int/ProgrammeOfActivities/cpa_db/R5MF4X6GWEJY8CVS9317ADKB2NUHTP/view

This has been verified and cross-checked by the VVB from the CDM website and is deemed appropriate/14/. Further, the project has been registered under VCS (VCS ID 2828) titled as, “Improved Cooking Stove Programme in Burundi”.

3.2 Methodology Deviations

The project activity did not apply methodology deviations during the current monitoring period.

3.3 Project Description Deviations

The project did not apply any project description deviations during the current monitoring period.

3.4 Grouped Project

The project activity is a grouped project, and the first instance of the grouped project disseminates ICS amongst households in Burundi/1/. There are no new instances added for the current monitoring period.

4 VERIFICATION FINDINGS

4.1 Project Implementation Status

The project activity involves distribution of energy efficient cookstoves in rural and/or peri urban areas of Burundi. A total of 290,050 cookstoves have been installed since the start of the project on 02/11/2018 with 10,438 ICS disseminated during the current monitoring period from 01/04/2022 to 31/12/2022 as confirmed from the installation database/12/. The installation and implementation are in accordance with the registered VCS Joint PDMR/1/. The batch wise distribution of stoves for the current monitoring period as confirmed from the installation database is as follows:

Batch Number	Start Date	End Date	Number of ICS disseminated
Batch 1	02-11-2018	01-11-2019	43,906
Batch 2	02-11-2019	01-11-2020	89,919
Batch 3	02-11-2020	01-11-2021	89,697
Batch 4	02-11-2021	01-11-2022	66,528

The stoves distributed are of model 'Matawi' which significantly reduce the fuel usage and emissions while cooking. The working condition of the distributed cookstoves was verified during the on-site audit and assessment team can confirm that they were found to be in operational condition.

The project proponent of the project activity is AERA Group SAS who own the rights to the carbon credits generated from the project activity.

The assessment team interviewed the end users during the on-site audit/9/ and confirmed that the project has been implemented as planned and mentioned in the registered VCS Joint PDMR/1/, the records available and the monitoring survey forms. No discrepancy has been found between the project implementation and the project description. PP has submitted the monitoring survey sheet and records/10/ where 154 households were surveyed during the current monitoring period. The following samples were taken from each batch

Sample size	Batch
35	Batch 1
37	Batch 2
37	Batch 3
45	Batch 4

VVB applied acceptance approach to check the acceptability of PP's monitoring sampling results.

Further, the procedures used by PP to address the concerns regarding the replacement of broken or damaged parts were checked and confirmed during the on-site audit via interviews with the project beneficiaries. All beneficiaries confirmed that they have been given training on how to use the stoves during the installation and are also aware of the procedures/ contact details to the PP in case of any stove is damaged or broken. In such cases, the PP guides them to rebuild or replace the necessary parts if needed.

This is the fifth verification of the project activity while second verification of the project activity under VCS and the total emission reductions achieved under the monitoring period i.e., 01/04/2022 to 31/12/2022 are 458,281 tCO_{2e}.

Therefore, the assessment team concludes the following:

- There are no material discrepancies between project implementation and the project description provided in the registered VCS Joint PDMR/1/
- The monitoring plan is implemented in line with the registered monitoring plan and monitoring system (i.e., process and schedule for obtaining, recording, compiling and analysing the monitored data and parameters) is appropriate.
- There are no material discrepancies between the actual monitoring system, and the monitoring plan set out in the project description/03/ and the applied methodology/8/
- All the ex-ante parameters which are used in the calculations of the emission reductions are consistent with the VCS PD MR/1/
- The GHG emission reductions or removals generated by the project have not included in another emission trading program or any other mechanisms that includes GHG allowance trading.
- The project has not received or sought any other form of environmental credit.

In view of the information verified above, the assessment team can conclude that the project has been implemented as described in the project description.

Ownership and other programs:

The project ownership is with AERA GROUP SAS., Project proponent (PP). During the registration of ICS, the participating household signs a declaration to transfer the ownership rights of the carbon assets generated from this project to the project proponent, the same has been confirmed from the agreement between AERA GROUP SAS and OBEN for transfer of credits dated, 11/12/2018/20/.

Sustainable Development Contributions:

As confirmed from the on-site audit, the project activity aligns with the United Nations Sustainable Development Goals (UN SDGs) by making a meaningful impact on sustainable development. This is achieved through various advantages, including the reduction in indoor air pollution, reduced travel time and distance for gathering fuelwood. Consequently, this effort contributes to the reduction of greenhouse gas emissions in the environment. Additionally, there are economic benefits, such as creating opportunities for local communities to engage in monitoring, user training, periodic maintenance, and post-lifetime replacement.

Table – Sustainable development contributions

Row number	SDG Target	SDG Indicator	Net Impact on SDG Indicator	Current Project Contributions	Contributions Over Project Lifetime	Means of Verification
1)	3.9	Proportion of users experiencing less smoke and time savings while using cookstoves	Implemented activities to increase	100% of the end-users surveyed experience less fumes when cooking with ICS distributed.	99% of the end-users experienced less fumes during the overall project.	The monitoring survey sheet/10/ for the current monitoring period was assessed by the verification team and it was found that 100% of the end-users answered “Yes” to the question, “Do you experience less fumes using OBEN stoves”. The information presented is deemed appropriate by the VVB.
2)	7.1	Number of households equipped with ICS.	Implemented activities to increase	10,438 households equipped with ICS.	290,050 households equipped with ICS during the project lifetime.	The project installation database/12/ was assessed by the verification team, and it was found that 10,438 were installed during the current monitoring period from 01/04/2022 to 31/12/2022. The number of cookstoves disseminated since the start date of the project activity is 290,050 (Batch 1, Batch 2, Batch 3 and Batch 4) The information presented is deemed appropriate and verifiable by the VVB.
3)	8	Number of descent Job created	Implemented activities to increase	No new jobs were created during this monitoring period.	The project created 30 jobs during its lifetime.	The sample employment records were assessed by the VVB and found that the project activity has created 30 jobs since the start date. There were no new employment records for the current monitoring period. The information presented in

						the monitoring report was deemed appropriate and complete by the VVB.
4)	13.0	Tonnes of greenhouse gas emissions avoided or removed	Implemented activities to increase	By distributing 290,050 cookstoves, the programme avoided emissions of 458,281 tCO2e during this monitoring period.	The expected emission reductions owing to the project activity are 3,544,611 tCO2e during the project lifetime.	The ER sheet and relevant supportive evidence was assessed by the verification team, and it was found that the emission reduction for the current monitoring period is correctly calculated to be 458,281 tCO2e. The expected emission reductions claimed by the project activity were cross checked from the registered Joint VCS PDMR /1/ and were found to be correctly stated.

4.2 Safeguards

4.2.1 No Net Harm

The project activity does not involve any negative environmental or socio-economic impacts, as the project activity involves:

- Distribution of energy efficient improved cookstoves which requires less amount of fuel compared to the open fire stoves.
- The cooking practice or habit on the project stove is identical to the practice followed on the baseline stoves. Therefore, the project does not force the population into any practice or habit that they will not eagerly take up.
- The project activity is about distribution of improved cooking devices which are energy efficient and release less smoke and toxic pollutant in environment compared to the baseline stoves.
- The grouped project activity will be creating employment for the people during different phases which will help to increase the economic growth of that area.

Hence, no mitigation measure is required.

4.2.2 Local Stakeholder Consultation

The local stakeholder consultation for the project activity took place at the CPA level on 19th October 2018/16/ at Buganda Hall, rural commune of Cibitoke province, Burundi from 10 am to 1 pm in line with the registered Joint VCS PDMR/1/. The mode of invitation of the LSC meeting was mainly letter and through telephone and/ or face to face invites.

The verification team can confirm that no negative comments regarding the project activity were received during the consultation. Detailed transcripts and responses of stakeholders have been included in the registered CDM PoA-DD/25/. The verification team confirmed through the onsite audit that PP has conducted regular spot checks to inspect the status of the ICS distributed. Further, the information regarding the procedure for replacement of damaged or missing parts was also checked.

During the local stakeholder consultation, there were no complaints received by the stakeholders, details of which are elaborated in section 2.2 of the MR version 1.8 /3/ and the registered VCS Joint PDMR/1/. Local implementation partners are responsible for taking concerns about project activities and communicating them to the PP while the project in process. As a result, ongoing stakeholder consultation is carried out via the grievance mechanism through a proper communication channel with the local stakeholders. No negative feedback has been received as confirmed during the onsite audit via interviews with the PP representatives for the current monitoring period. The same was confirmed through the Grievance register/17/ provided by the PP.

According to the assessment team, based on on-site interviews and observations/9/, the grievance redressal system would handle concerns that may occur throughout project design and implementation.

In case of any support or if replacement of any stove part is required, the stove users can contact the local implementation partner. The contact details for the same, were shared during the time of installation. In case of any feedback the beneficiaries can contact the site team/representative of the PP and register their grievance. The grievance addressal procedure has been designed and is being implemented in accordance with section 2.2 of the MR/3/ and that it is effective in accomplishing its goal, according to the on-site interviews/33/ and document review.

4.3 AFOLU-Specific Safeguards

This project is a non-AFOLU project. Therefore, this section is not required.

4.4 Accuracy of GHG Emission Reduction and Removal Calculations

The verification team has reviewed the monitoring plan and found that the monitoring of GHG emission reduction from the project activity was implemented in accordance with the registered VCS Joint PDMR/1/. The monitoring plan has been implemented as per the applied methodology and all the parameters in the monitoring plan have been sufficiently monitored as per the applied methodology, AMS-II.G v.10: Energy efficiency measures in thermal applications of non-renewable biomass.

Data and parameters fixed at the time of Validation

S.No	Parameter	Value	Assessment
1.	<i>Bold,p</i> (tonnes/person/year) Annual quantity of woody biomass that would have been used per person in the household in the absence of the project activity to generate useful thermal energy equivalent to that provided by the project devices	1.07	The value applied is consistent with the conservative literature as detailed in the registered CDM POA-DD/25/ <i>The value was</i> fixed at the time of validation. It is found to be consistent with the VCS Joint PD MR/1/.
2.	<i>Np,HH</i> (tonnes/household/year) Average number of persons served per household prior to project implementation	4.7	The figure has been sourced from the USAID 2008: Burundi population Survey: Status and Structure of Population/26/. The value was fixed ex ante at the time of validation and is found to be consistent with the VCS joint PD MR/1/.
3.	<i>Bold,HH</i> (tonnes/household/year) Annual quantity of woody biomass that would have been used in the household in the absence of the project activity to generate useful thermal energy equivalent to that provided by the project devices	5.03	This is a calculated value determined by the following equation: $Bold,H,H = Bold \times Np,H$ (=Bold,HH when only one project device per household is distributed) = $1.07 \times 4.7 = 5.03/4/$

			<i>The value is fixed ex ante at the time of validation and is found to be consistent with the VCS Joint PD MR/1/</i>
4.	<i>Bold_{i,j}</i> (tonnes/year) Annual quantity of woody biomass that would have been used in the absence of the project activity to generate useful thermal energy equivalent to that provided by the project device type i and batch j	5.03	The value is calculated using the following equation: $Bold_{i,j} = \frac{B_{old,HH}}{N_{d,HH}}$ The value is fixed ex ante at the time of validation and is consistent with the VCS Joint PD MR taking into consideration $N_{d,HH}$ value of 1 for ex-ante purposes.-/1/
5.	$\eta_{old,i,j}$ (Fraction) Efficiency of the device being replaced	0.1	The value has been determined ex ante at the CPA level and found consistent with the registered CDM CPA/27/ and the VCS Joint PD MR/1/ based on the applied methodology, AMS-II.G/8/ for default values and/or baseline surveys literature and statistics.
6.	Leakage (Fraction) Net to gross adjustment factor to account for leakages	0.95	The value has been determined at the CPA level and found consistent with the registered CDM CPA/27/ and VCS joint PD MR/1/ based on the applied methodology, AMS-II.G default value/8/
7.	$f_{NRB,y}$ (Fraction) Fraction of woody biomass saved by the project activity in year y that can be established as non-renewable biomass.	81.83 %	The value was determined ex ante at the CPA level and is found consistent with the registered CDM CPA/27/ and the VCS joint PD MR/1/ based on the applied methodology, AMS-II.G default value/8/
8.	NCV Biomass (TJ/tonne) Net calorific value of the non-renewable woody biomass, briquettes or charcoal used in project devices	0.0156	The applied value is consistent with the IPCC Guidelines for National Greenhouse Gas Inventories/28/ and the applied methodology AMS-II.G/8/. The value is also found to be consistent with the VCS Joint PD MR/1/.

Data and parameters Monitored.

Monitored Parameter(s)		
Parameter	N _{y,i,j} , Number of project devices of type i and batch j operating during year y	
Means of Verification		
	Criteria/Requirements	Assessment/Observation

	Measuring/Reading/Recording Frequency	As per the registered monitoring plan/1/, the parameter will be monitored Biennially.				
	Is measuring and reporting frequency in accordance with the monitoring plan and monitoring methodology? (Yes/No)	Yes, measuring and reporting frequency is in accordance with registered monitoring plan and methodology.95/10 confidence precision applicable for this MP. Precision is met for all batches except Batch 3. For the batch 3 the precision is not met at 95/10, therefore the lower bound of the interval(79.19%) is used instead of the monitoring results (89.19%)				
	Monitoring Equipment	The data has been sourced from monitory surveys for the current monitoring period/10/				
	Monitored Value	Batch Year	Batch 1	Batch 2	Batch 3	Batch 4
		2022	31,190	65,916	53,514	47,339
	Is accuracy of the monitoring equipment as stated in the monitoring plan? If the monitoring plan does not specify the accuracy of the monitoring equipment, does the accuracy of the monitoring equipment comply with local/national standards, or as per the manufacturer's specification?	. NA				
	Is the accuracy valid for the entire measuring range or do different accuracy levels apply to different measuring ranges?	NA				
	Calibration frequency/interval:	NA				
	Is the calibration interval in line with the monitoring plan and/or methodology? If the monitoring plan does not specify the frequency of calibration, is the selected frequency in	NA				

	accordance with the local/national standards, pending until the findings are closed or as per the manufacturer's specifications?										
	Is the calibration of measuring equipment carried out by an accredited person or institution?	NA									
	Is(are) calibration(s) valid for the whole reporting period?	NA									
	Is the calibration carried out for a measuring range comparable with the range for which measurements have been carried out?	NA									
	How were the values in the monitoring report verified?	The number of stoves that are operational within each batch was sourced from the monitoring surveys/10/. $N_{y,i,j} = \text{Pop stoves} * N$ ($N_{y,i,j}$ for each batch, is determined by multiplying all devices sold in the batch with the proportion of cooking stoves found to be operating in a representative sample of each batch (Pop_stoves_y).) The monitored proportion of stoves found operational for the batch are represented in the table below. <table><tr><td>Batch/ Year</td><td>Batch 1</td><td>Batch 2</td><td>Batch 3</td><td>Batch 4</td></tr><tr><td>2022</td><td>94.29%</td><td>97.30%</td><td>79.19%</td><td>95.56%</td></tr></table> The calculations have been cross-checked from the ER sheet/4/ and found accurate for the current monitoring period. The monitored samples checked by the VVB during on-site visit inspection/9/	Batch/ Year	Batch 1	Batch 2	Batch 3	Batch 4	2022	94.29%	97.30%	79.19%
Batch/ Year	Batch 1	Batch 2	Batch 3	Batch 4							
2022	94.29%	97.30%	79.19%	95.56%							

	Does the data management ensure correct transfer of data and reporting of emission reductions and are necessary QA/QC processes in place?	Yes, the data management ensure correct transfer of data and reporting of emission reduction and all necessary QA/QC processes are in place.
Findings	. CAR 04 and CAR 05 were raised and resolved.	
Conclusion	The parameter has been monitored appropriately, in accordance with the registered monitoring plan (as per measurement methods and procedures to be applied) and applied methodology. The monitoring results were recorded consistently as per the approved frequency in the monitoring plan. The verification team is able to confirm that the project is implemented as per the registered PD and there is no discrepancy observed between the actual monitoring system and the monitoring plan set out in the registered PD and the applied methodology. The emission reduction calculation for the project activity is estimated based on the biomass saved by the ICS..	

Parameter	μ_y : Adjustment to account for any continued use of pre-project devices during year y	
Means of Verification	Criteria/Requirements	Assessment/Observation
	Measuring/Reading/Recording Frequency	As per the registered monitoring plan/1/, the parameter will be monitored Biennially.
	Is measuring and reporting frequency in accordance with the monitoring plan and monitoring methodology? (Yes/ No)	Yes, For batch 3 where the precision was not met, VVB confirmed that PP has applied the lower bound value instead of monitored value which is in accordance to applied methodology paragraph 41, "In cases where survey results indicate that 90/10 precision or 95/10 precision are not achieved, the lower bound of the 90 per cent or 95 per cent confidence interval of the parameter value may be chosen as an alternative to repeating the survey efforts to

		achieve the 90/10 or 95/10 precision” VVB also found that PP has applied the higher bound value instead of lower bound as the higher bound of the interval (29.83%) is more conservative than the lower bound (5.31%) instead of monitored value of 17.57% as applying 5.31% to the parameter μ_y will lead to increase in the ERs
	Monitoring Equipment	Monitoring is carried out with the help of project installation database and monitoring surveys/10/
	Is accuracy of the monitoring equipment as stated in the monitoring plan? If the monitoring plan does not specify the accuracy of the monitoring equipment, does the accuracy of the monitoring equipment comply with local/national standards, or as per the manufacturer’s specification?	NA
	Is the accuracy valid for the entire measuring range or do different accuracy levels apply to different measuring ranges?	NA
	Calibration frequency/interval:	NA
	Is the calibration interval in line with the monitoring plan and/or methodology? If the monitoring plan does not specify the frequency of calibration, is the selected frequency in accordance with the local/national standards, pending until the findings are closed or as per the manufacturer’s specifications?	

	Is the calibration of measuring equipment carried out by an accredited person or institution?	NA																		
	Is(are) calibration(s) valid for the whole reporting period?	NA																		
	Is the calibration carried out for a measuring range comparable with the range for which measurements have been carried out?	NA																		
	How were the values in the monitoring report verified?	The values were verified from the monitoring survey conducted for the current monitoring period/10/ the verification team further verified the frequency of usage of both project devices and baseline devices via the interviews conducted during the on-site visit/9/ <table><tr><td></td><td>Batch 1</td><td>Batch 2</td><td>Batch 3</td><td>Batch 4</td></tr><tr><td>1- μ_y</td><td>95.76%</td><td>98.65%</td><td>70.17%</td><td>98.15%</td></tr><tr><td>μ_y</td><td>4.24%</td><td>1.35%</td><td>29.83%</td><td>1.85%</td></tr></table>					Batch 1	Batch 2	Batch 3	Batch 4	1- μ_y	95.76%	98.65%	70.17%	98.15%	μ_y	4.24%	1.35%	29.83%	1.85%
		Batch 1	Batch 2	Batch 3	Batch 4															
1- μ_y	95.76%	98.65%	70.17%	98.15%																
μ_y	4.24%	1.35%	29.83%	1.85%																
Does the data management ensure correct transfer of data and reporting of emission reductions and are necessary QA/QC processes in place?	Yes, the data management ensure correct transfer of data and reporting of emission reduction and all necessary QA/QC processes are in place.																			
Findings	CAR 04 and CAR 05 were raised and resolved.																			
Conclusion	The parameter has been monitored appropriately, in accordance with the registered monitoring plan (as per measurement methods and procedures to be applied) and applied methodology. The monitoring results were recorded consistently as per the approved frequency in the monitoring plan. The verification team is able to confirm that the project is implemented as per the registered PD and there is no discrepancy observed between the actual monitoring system and the monitoring plan set out in the registered PD and the applied methodology. The emission reduction calculation for the project activity is estimated based on the biomass saved by the ICS..																			

Parameter	$\eta_{new,i,j}$, Efficiency of the device of each type i and batch j implemented as part of the project activity.	
Means of Verification	Criteria/Requirements	Assessment/Observation
	Measuring/Reading/Recording Frequency	As per the registered monitoring plan/1/ the frequency of monitoring this parameter is annual
	Is measuring and reporting frequency in accordance with the monitoring plan and monitoring methodology? (Yes/ No)	Yes, PP followed the approach outlined in AMS-II.G, which allows for alternative methods when certain conditions are met. Specifically, efficiency shall be measured/estimated in accordance to the measurement and procedures under the table 11 point 3 of the applied methodology which states that“However, the following simplified approach may be used, when the efficient cook stoves are produced by a manufacturer with a good quality management system in place to ensure that the individual equipment produced do not vary beyond the range of acceptance limits (e.g. characteristics such as materials, critical dimensions): (i) Conduct a sample test on three cook stoves with three tests conducted for each stove. The test can be carried out by project proponents by themselves or stove manufacturers (ii) If the standard deviation of the nine test results indicated above is very small and 90/10 precision requirement is met (in this case, the value of the t-distribution for 90 per cent confidence shall be used instead of Z value), the efficiency determined is acceptable, otherwise more sample tests would be required until 90/10 precision is met. VVB checked and confirmed that Option 3 (simplified method) has been selected.

		Hence only 3 stoves have been tested by batch and the precision has been met for all batches. The results are therefore in line with the applied methodology
	Monitoring Equipment	Parameter is monitored through WBTs performed by Centre de Recherche Universitaire sur les Energies Alternatives (CRUEA)" (University of Burundi)
	Is accuracy of the monitoring equipment as stated in the monitoring plan? If the monitoring plan does not specify the accuracy of the monitoring equipment, does the accuracy of the monitoring equipment comply with local/national standards, or as per the manufacturer's specification?	NA
	Is the accuracy valid for the entire measuring range or do different accuracy levels apply to different measuring ranges?	NA
	Calibration frequency/interval:	
	Is the calibration interval in line with the monitoring plan and/or methodology? If the monitoring plan does not specify the frequency of calibration, is the selected frequency in accordance with the local/national standards, pending until the findings are closed or as per the manufacturer's specifications?	NA
	Is the calibration of measuring equipment carried out by an accredited person or institution?	NA
	Is(are) calibration(s) valid for the whole reporting period?	NA

Is the calibration carried out for a measuring range comparable with the range for which measurements have been carried out?	NA										
How were the values in the monitoring report verified?	<table><tr><th>Year</th><th>Batch 1</th><th>Batch 2</th><th>Batch 3</th><th>Batch 4</th></tr><tr><td>WBT results 2022</td><td>29.62%</td><td>30.74%</td><td>31.52%</td><td>32.1%</td></tr></table> The values were verified with the WBT reports/13/ and deemed appropriate. The reported data is cross checked with registered VCS PD MR/1/ calculation provided in the ER sheet/4/ for yearly loss. For Batch 4 (the most recent batch) from the WBT conducted, the efficiency was found to be 32.4%, which is close to the new ICS thermal efficiency of 32.1% and the older stoves were having lesser efficiency in comparison to the design efficiency. This trend shows a continuous drop in efficiency with the age of the cookstove batch, the older the batch, the lower the efficiency. VVB during the desk review and during the site visit confirmed that the stoves in question are handmade, and the difference in efficiency between batch 4 and new stoves, as per the project document, is 0.3%, resulting in a relative difference of 0.83%. Even though this variance is within acceptable limits considering the handmade nature of the stoves, which can lead to minor differences in efficiency, VVB confirmed that since the efficiency of Batch 4 is more than design efficiency of the stoves, the project proponent (PP) has opted to cap the efficiency of the 4th batch to the new ICS value of 32.1%. The calculation of Emission Reductions (ERs) has been revised accordingly.	Year	Batch 1	Batch 2	Batch 3	Batch 4	WBT results 2022	29.62%	30.74%	31.52%	32.1%
Year	Batch 1	Batch 2	Batch 3	Batch 4							
WBT results 2022	29.62%	30.74%	31.52%	32.1%							

		Furthermore, according to VMR 006 version 1.2, Appendix 1, and the associated pictures, VVB confirms that the OBEN fixed stove can be classified as an intermediate ICS tier 2-3. Its fixed structure, along with the dual protection layers—ceramic liner and brick liner—enhances its thermal efficiency, allowing it to achieve efficiency levels above 30%. VVB has checked the same while inspecting the samples on site and also confirmed from the manufacturer specification
	Does the data management ensure correct transfer of data and reporting of emission reductions and are necessary QA/QC processes in place?	This is a calculated parameter and transfer of data, calculation and reporting in ER calculation is correct.
Findings	No findings	
Conclusion	The parameter has been monitored appropriately, in accordance with the registered monitoring plan (as per measurement methods and procedures to be applied) and applied methodology. The monitoring results were recorded consistently as per the approved frequency in the monitoring plan. The verification team is able to confirm that the project is implemented as per the registered PD and there is no discrepancy observed between the actual monitoring system and the monitoring plan set out in the registered PD and the applied methodology. The emission reduction calculation for the project activity is estimated based on the biomass saved by the ICS.	

Parameter	Date of commissioning of batch j	
Means of Verification	Criteria/Requirements	Assessment/Observation
	Measuring/Reading/Recording Frequency	As per the registered monitoring plan, the parameter is monitored at the time of commissioning/1/
	Is measuring and reporting frequency in accordance with the monitoring plan	Yes

	and monitoring methodology? (Yes/No)	
	Monitoring Equipment	NA
	Is accuracy of the monitoring equipment as stated in the monitoring plan? If the monitoring plan does not specify the accuracy of the monitoring equipment, does the accuracy of the monitoring equipment comply with local/national standards, or as per the manufacturer's specification?	NA
	Is the accuracy valid for the entire measuring range or do different accuracy levels apply to different measuring ranges?	NA
	Calibration frequency/interval:	NA
	Is the calibration interval in line with the monitoring plan and/or methodology? If the monitoring plan does not specify the frequency of calibration, is the selected frequency in accordance with the local/national standards, pending until the findings are closed or as per the manufacturer's specifications?	NA
	Is the calibration of measuring equipment carried out by an accredited person or institution?	NA
	Is(are) calibration(s) valid for the whole reporting period?	.NA
	Is the calibration carried out for a measuring range comparable with the range for which measurements have been carried out?	NA
	How were the values in the monitoring report verified?	Batch 1 covers stoves sold between 02/11/2018 and 01/11/2019; Batch 2 covers stoves sold between 02/11/2019 and 01/11/2020;

		Batch 3 covers stoves sold between 02/11/2020 and 01/11/2021, and Batch 4, stoves sold between 02/11/2021 and 01/11/2022. The values were verified from the registered VCS PD MR/1/ and the ER spreadsheet /4/. As per the registered monitoring plan/1/, the Project Participant opts to group the devices in “batches” and the latest date of commissioning of a device within the batch shall be used as the date of commissioning for the entire batch
	Does the data management ensure correct transfer of data and reporting of emission reductions and are necessary QA/QC processes in place?	Yes
Findings	CAR 04 and CAR 05 were raised and resolved.	
Conclusion	The parameter has been monitored appropriately, in accordance with the registered monitoring plan (as per measurement methods and procedures to be applied) and applied methodology. The monitoring results were recorded consistently as per the approved frequency in the monitoring plan. The verification team confirms that the project is implemented as per the registered PD and there is no discrepancy observed between the actual monitoring system and the monitoring plan set out in the registered PD and the applied methodology. The emission reduction calculation for the project activity is estimated based on the biomass saved by the ICS.	

Parameter	Date of commissioning of project device i.
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Means of Verification	Criteria/Requirements	Assessment/Observation
	Measuring/Reading/Recording Frequency	As per the registered monitoring plan, the parameter is monitored at the time of commissioning/1/
	Is measuring and reporting frequency in accordance with the monitoring plan and monitoring methodology? (Yes/No)	NA
	Monitoring Equipment	NA
	Is accuracy of the monitoring equipment as stated in the monitoring plan? If the monitoring plan does not specify the accuracy of the monitoring equipment, does the accuracy of the monitoring equipment comply with local/national standards, or as per the manufacturer's specification?	NA
	Is the accuracy valid for the entire measuring range or do different accuracy levels apply to different measuring ranges?	NA
	Calibration frequency/interval:	NA
	Is the calibration interval in line with the monitoring plan and/or methodology? If the monitoring plan does not specify the frequency of calibration, is the selected frequency in accordance with the local/national standards, pending until the findings are closed or as per the manufacturer's specifications?	NA

	Is the calibration of measuring equipment carried out by an accredited person or institution?	NA					
	Is(are) calibration(s) valid for the whole reporting period?	NA					
	Is the calibration carried out for a measuring range comparable with the range for which measurements have been carried out?	NA					
	How were the values in the monitoring report verified?	Batch	Batch 1	Batch 2	Batch 3	Batch 4	
		Date	02/11 /2018	02/11 /2019	02/11 /2020	02/11 /2021	
		The values were verified from the registered monitoring plan/1/ and the ER spreadsheet/4/					
	Does the data management ensure correct transfer of data and reporting of emission reductions and are necessary QA/QC processes in place?	Yes					
Findings	CAR 04 and CAR 05 were raised and resolved.						
Conclusion	The parameter has been monitored appropriately, in accordance with the registered monitoring plan (as per measurement methods and procedures to be applied) and applied methodology. The monitoring results were recorded consistently as per the approved frequency in the monitoring plan. The verification team is able to confirm that the project is implemented as per the registered PD and there is no discrepancy observed between the actual monitoring system and the monitoring plan set out in the registered PD and the applied methodology. The emission reduction calculation for the project activity is estimated based on the biomass saved by the ICS..						

Parameter	N, Number of project devices distributed	
Means of Verification		
	Criteria/Requirements	Assessment/Observation
	Measuring/Reading/Recording Frequency	As per the registered monitoring plan/1/, the parameter was recorded at the time of commissioning/distribution of project devices.
	Is measuring and reporting frequency in accordance with the monitoring plan and monitoring methodology? (Yes/ No)	Yes
	Monitoring Equipment	NA
	Is accuracy of the monitoring equipment as stated in the monitoring plan? If the monitoring plan does not specify the accuracy of the monitoring equipment, does the accuracy of the monitoring equipment comply with local/national standards, or as per the manufacturer's specification?	NA
	Is the accuracy valid for the entire measuring range or do different accuracy levels apply to different measuring ranges?	NA
	Calibration frequency/interval:	NA
	Is the calibration interval in line with the monitoring plan and/or methodology? If the monitoring plan does not specify the frequency of calibration, is the selected frequency in accordance with the local/national standards, pending until the findings are closed or as per the manufacturer's specifications?	NA
	Is the calibration of measuring equipment carried out by an accredited person or institution?	NA
	Is(are) calibration(s) valid for the whole reporting period?	NA

	Is the calibration carried out for a measuring range comparable with the range for which measurements have been carried out?	NA				
	How were the values in the monitoring report verified?	Out of the 290,050 ICS distributed as confirmed from the project installation database/12/, the full use equivalent of the ICS as per the monitoring surveys conducted for the current MP/10/ is given below				
		Batc h	Bat ch 1	Bat ch 2	Bat ch 3	Bat ch 4
		N	33, 08 0	67, 74 7	67, 58 0	49, 54 1
	Does the data management ensure correct transfer of data and reporting of emission reductions and are necessary QA/QC processes in place?	Yes				
Findings	CAR 04 and CAR 05 were raised and resolved.					
Conclusion	The parameter has been monitored appropriately, in accordance with the registered monitoring plan (as per measurement methods and procedures to be applied) and applied methodology. The monitoring results were recorded consistently as per the approved frequency in the monitoring plan. The verification team is able to confirm that the project is implemented as per the registered PD and there is no discrepancy observed between the actual monitoring system and the monitoring plan set out in the registered PD and the applied methodology. The emission reduction calculation for the project activity is estimated based on the biomass saved by the ICS..					

Parameter	N _{dHH} , Number of project devices distributed per household	
Means of Verification		
	Criteria/Requirements	Assessment/Observation

	Measuring/Reading/Recording Frequency	As per the registered monitoring plan/1/, the parameter was recorded at the time of commissioning/distribution of project devices.
	Is measuring and reporting frequency in accordance with the monitoring plan and monitoring methodology? (Yes/ No)	Yes
	Monitoring Equipment	NA
	Is accuracy of the monitoring equipment as stated in the monitoring plan? If the monitoring plan does not specify the accuracy of the monitoring equipment, does the accuracy of the monitoring equipment comply with local/national standards, or as per the manufacturer's specification?	NA
	Is the accuracy valid for the entire measuring range or do different accuracy levels apply to different measuring ranges?	NA
	Calibration frequency/interval:	NA
	Is the calibration interval in line with the monitoring plan and/or methodology? If the monitoring plan does not specify the frequency of calibration, is the selected frequency in accordance with the local/national standards, pending until the findings are closed or as per the manufacturer's specifications?	NA
	Is the calibration of measuring equipment carried out by an accredited person or institution?	NA
	Is(are) calibration(s) valid for the whole reporting period?	NA
	Is the calibration carried out for a measuring range comparable with the range for which measurements have been carried out?	NA
	How were the values in the monitoring report verified?	The value for this paramter is 1.03 and this has been taken into consideration as a

		household purchases more than one cooking stoves, monitoring surveys of sampled kitchens' stoves in use will account for any additional project device and be reflected in adjustment factor Nd,HH. It was also verified by the verification team during the onsite visit that only one cooking stove per household is registered in the electronic database. The ND,HH value used for ex-ante estimation is 1. However by assessing the database an average of 1.03 is found. This value as more conservative than ex-ante value (1) is taken into consideration for ER calculation. The column previously labeled as "Check Nd'HH" has been renamed to "Unique Household Occurrences" to more accurately reflect its purpose. The calculation has been demonstrated in the ER sheet and deemed appropriate by the assessment team.
	Does the data management ensure correct transfer of data and reporting of emission reductions and are necessary QA/QC processes in place?	Yes
Findings	CAR 06 was raised and resolved.	
Conclusion	The parameter has been monitored appropriately, in accordance with the registered monitoring plan (as per measurement methods and procedures to be applied) and applied methodology. The monitoring results were recorded consistently as per the approved frequency in the monitoring plan.	

The verification team is able to confirm that the project is implemented as per the registered PD and there is no discrepancy observed between the actual monitoring system and the monitoring plan set out in the registered PD and the applied methodology.

The emission reduction calculation for the project activity is estimated based on the biomass saved by the ICS..

Sampling approach:

By the end of current monitoring period, the project activity has installed 290,050 ICS/12/ As defined in the registered CDM CPA-DD/27/.

The sample size for estimating the proportional parameters $pop_{y,y}$ and the proportion of meals cooked with pre-project devices (or their reverse) is calculated using the formula provided in the “Guideline: Sampling and surveys for CDM project activities and PoAs” Appendix 1 para 12:

$$n \geq \frac{1.645^2 N \times p(1-p)}{(N-1) \times 0.1^2 \times p^2 + 1.645^2 p(1-p)}$$

The monitoring of $pop_{y,y}$ and the proportion of meals cooked with preproject devices is based on the same sample, which is the sample with the larger sample size of the two.

For the average efficiency of the cookstoves, the sample size is calculated using the formula mentioned in the “Guideline: Sampling and surveys for CDM project activities and PoAs” version.04.0 (simple random sampling, Appendix 1, para.51) applicable to the determination of a mean value parameter:

$$n \geq \frac{1.645^2 NV}{(N-1) \times 0.1^2 + 1.645^2 V}$$

.Determination of the Sample Size:

A sample size has been determined by the PP to meet reliability requirements. Parameter values have been estimated as per the requirements in AMS-II G. As per methodology para 48, “When biennial inspection is chosen a 95 per cent confidence interval and a 10 per cent margin of error shall be achieved for the sampling parameter. On the other hand, when the project proponent chooses to inspect annually, a 90 per cent confidence interval and a 10 per cent margin of error shall be achieved for the sampled parameters. In cases where survey results indicate that 90/10 precision or 95/10 precision are not achieved, the lower bound of the 90 per cent or 95 per cent confidence interval of the parameter value may be chosen as an alternative to repeating the survey efforts to achieve the 90/10 or 95/10 precision”. Although an annual inspection has been conducted for this monitoring period and thus the sample size has been calculated to obtain a 95/10 confidence precision. The PP has drawn a sample of 154 households from the project database which is calculated along with oversampling and meeting the desire sample size/12/ CAR 02 was raised and resolved.

The verification team has confirmed that the project meets the desired precision that has been mentioned in the monitoring plan/1/ The reliability calculations have been summarized in the table below:

Batch 1

Parameter	$Z_{\alpha/2}$	N	p	Minimum sample size	Final sample size	Monitoring precision achieved
pop household,y	1.96	43,906	96.77 %	16	35	Yes
1-UY	1.96	43,906	94.67 %	27	35	Yes

Batch 2

Parameter	$Z_{\alpha/2}$	N	p	Minimum sample size	Final sample size	Monitoring precision achieved
pop household,y	1.96	89,919	98.33 %	9	37	Yes
1-UY	1.96	89,919	97.79 %	11	37	Yes

Batch 3

Parameter	$Z_{\alpha/2}$	N	p	Minimum sample size	Final sample size	Monitoring precision achieved
pop household,y	1.96	89,697	97.50 %	12	37	Yes
1-UY	1.96	89,697	99.21 %	5	37	Yes

Batch 4

Parameter	$Z_{\alpha/2}$	N	p	Minimum sample size	Final sample size	Monitoring precision achieved
pop household,y	1.96	66,528	100%	0	45	Yes
1-UY	1.96	66,528	99.64 %	3	45	Yes

The WBTs were conducted annually for each batch/13/. Stoves distributed from batches 2019,2020,2021 and 2022 were tested in 2022/13/,

Batch 2019 tested in 2022:

Parameter	$Z_{\alpha/2}$	N	SD	Mean	Calculated sample size	Calculated sample size w/ oversampling	Final sample size	Precision achieved
efficiency	1.645	43,906	0.02	29.8%	3	3	3	1%

Batch 2020 tested in 2022

Parameter		N	SD	Mean	Calculated sample size	Calculated sample size w/ oversampling	Final sample size	Precision achieved
efficiency	1.645	89,919	0.02	29.75%	3	3	3	1%

Batch 2021 tested in 2022

Parameter		N	SD	Mean	Calculated sample size	Calculated sample size w/ oversampling	Final sample size	Precision achieved
efficiency	1.645	89,697	0.02	29.75%	3	3	3	2%

Batch 2022 tested in 2022

Parameter		N	SD	Mean	Calculated sample size	Calculated sample size w/ oversampling	Final sample size	Precision achieved
efficiency	1.645	66,528	0.02	29.75%	3	3	3	1%

Final total sample sizes during this monitoring period have been 154 households. The sample sizes were determined as below:

Batch	Sample size before over sampling	Sample size after over sampling	Final number of surveys	Number of WBTs
Batch 1 (01/11/2019)	22	27	35	3
Batch 2 (01/11/2020)	9	11	37	3
Batch 3 (01/11/2021)	10	12	37	3
Batch 4 (01/11/2022)	2	3	45	3
Total	34	43	154	12

Conduction of Monitoring Survey:

Selected sample details were conveyed to the field team, which visited each sample householder and collected the details. *The assessment team interviewed the people involved in the monitoring survey/13/ and has also witnessed the demonstration of the step-by-step collection of the information during the survey. The verified details of the survey process are as below:*

- The PP for prepares a survey which contains questions to be asked and details to be verified regarding ICS usage during the survey. This was assessed by the assessment team during the on-site audit while interviewing the field team/9/.

- The surveyor takes the feedback from beneficiaries, checks operating condition of the stoves, and upload the details along with the details and photograph of the respondent/beneficiaries.
- The GPS coordinates of location during the survey are also noted down and survey results do not get submitted without GPS results.

The monitoring survey forms/35/ are submitted by the PP from their server and checked by the verification team for details including photographs of the project ICS and GPS locations of the beneficiaries.

Thus, the assessment team is of the opinion that the PP has established and followed a robust and accurate procedure for conducting monitoring survey. The survey personnel were well trained and competent enough to carry out the survey and understand the gravity of correct data collection requirement. Further, preparedness for conducting survey was adequate and survey plan was robust. The integrity and correctness of the survey data is reasonably assured.

Verification of the Sampling survey by the Assessment team:

- The assessment team has checked and verified the ICS installation records/12/ as provided by the PP and total number of installed stoves are verified as 290,050. Thus, the PP has correctly considered the population size N in determination of sample size.
- The registered PD mentions the 90/10 confidence/precision ration for sample determination and the same has been correctly applied.
- The sample survey questions used, and survey process is robust and is able to provide the result for determination of operational stove from the selected samples.
- The monitoring survey activities have been carried out in compliance with the monitoring frequency and procedures mentioned in the applied methodology/09/ for the parameters under consideration.
- The monitoring survey has been carried out by the well-trained personnel. Monitoring parameters, $N_{y,j}$, μ_y and $\eta_{new,i,j}$ are monitored through monitoring sample surveys. Verification team has checked the survey records and sample size calculation, and it is found to in line with the applied methodology/08/ and registered PD MR/13/.
- The assessment team used the acceptance sampling approach (in line with para 28 of CDM Sampling Standard/18/) and a sample size of 08 was determined (determined through table 2 of the CDM Sampling Standard/11/), based on 0.5% Acceptable quality level and 20% unacceptable quality level (based on the VVB's professional judgement) with 10% of producer risk and 10% of consumer risk (maximum errors as indicated in CDM Sampling standard) in line with para 30 and 31 of "Sampling and surveys for CDM projects activities and programmes of activities" version 09.0/11/ respectively. Thus, the acceptance number taken by the assessment team is 0.
- 08 samples from the survey data were randomly selected and communicated to the PP for audit. All 08 samples were checked and verified by the team.
- Assessment team interviewed all 08 samples, and as two stoves were distributed in each household, the operational status of the stoves was checked. it was observed that all the 08 stoves were operational and hence, no discrepant records were observed with the survey data of the PP.

Emission reduction calculations

Baseline Emissions:

The project activity is about the replacing the traditional three stone fir pot with the improved energy efficient rocket stoves. Therefore, equations 1 and 2 from the applied methodology is used in calculation of net GHG emissions.

$$ER_y = \sum_i \sum_j ER_{y,i,j}$$

Equation (1)

i	Indices for the situation where more than one type/model of improved cookstove is introduced to replace three-stone fire
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j	Indices for the situation where there is more than one batch of improved cookstove of type i
ER _y	Emission reductions during year y in t CO ₂ e
ER _{y,i,j}	Emission reductions by improved cookstove of type i and batch j during year y in t CO ₂ e

where,

$$ER_{y,i,j} = B_{y,savings,i,j} \times N_{y,i,j} \times \mu_y \times f_{NRB,y} \times NCV_{biomass} \times EF_{projected_fossil\ fuel} \text{ Equation (2)}$$

where,

B _{y,savings,i,j}	Quantity of woody biomass that is saved in tonnes per improved cookstove of type i and batch j during year y
f _{NRB,y}	Fraction of woody biomass that can be established as non-renewable biomass (f _{NRB})
NCV _{biomass}	Net calorific value of the non-renewable woody biomass that is substituted (IPCC default for wood fuel, 0.015 TJ/tonne, based on the gross weight of the wood that is 'air-dried')
EF _{projected_fossilfuel}	Emission factor for the fossil fuels projected to be used for substitution of non-renewable woody biomass by similar consumers. Use a value of 63.7 tCO ₂ /TJ
N _{y,j,j}	Number of project devices of type i and batch j operating during year y.
μ _y	Adjustment to account for any continued use of pre-project devices during the year y

The amount of woody biomass saved due to implementation of improved cookstoves will be calculated using the equation below:

$$B_{y,savings,i,j} = B_{old,i,j} \times \left(1 - \frac{\eta_{old,i,j}}{\eta_{new,i,j}}\right) \text{ Equation (4)}$$

where,

η _{old,i,j}	Efficiency of the old devices being replaced by project devices of type i and batch j.
η _{new,i,y}	Efficiency of the improved cookstove type i and batch j determined through water boiling test (WBT). Alternatively, efficiency may be determined using Equation 5.

B_{old,i,j} is determined as follows:

$$B_{old,i,j} = B_{old,HH} \div N_{d,HH}$$

Where:

$B_{old,HH}$	=	Annual quantity of woody biomass that would have been used in the household in the absence of the project activity to generate useful thermal energy equivalent to that provided by the project devices (tonnes/household/year)
$N_{d,HH}$	=	Number of project devices per household (number)

For Batch 1,

$$By,savings,i,j = 3.24$$

$$Ny,ij = 31,190$$

$$\mu y = 95.76\%$$

$$Fnrb,y = 81.83\%$$

$$NCVbiomass = 0.0156$$

$$EFprojectedfossilfuel = 63.70$$

$$Leakageadj = 0.95$$

$$ERy = 3.24 \times 31,190 \times 95.76\% \times 81.83\% \times 0.0156 \times 0.95 = 74,759$$

For Batch 2,

$$By,savings,i,j = 3.30$$

$$Ny,ij = 65,916$$

$$\mu y = 98.65\%$$

$$Fnrb,y = 81.83\%$$

$$NCVbiomass = 0.0156$$

$$EFprojectedfossilfuel = 63.70$$

$$Leakageadj = 0.95$$

$$ERy = 3.30 \times 65,916 \times 98.65\% \times 81.83\% \times 0.0156 \times 63.70 \times 0.95 = 1,65,773$$

For Batch 3 (ECOYEY),

$$By,savings,i,j = 3.34$$

$$Ny,ij = 44,468$$

$$\mu y = 72.14\%$$

$$Fnrb,y = 81.83\%$$

$$NCVbiomass = 0.0156$$

$$EFprojectedfossilfuel = 63.70$$

$$Leakageadj = 0.95$$

$$ERy = 3.34 \times 39,480 \times 81.83\% \times 70.17\% \times 0.0156 \times 63.70 \times 0.95 = 71,472$$

For Batch 3 (POWA)

By,savings,i,j = 3.34

Ny,ij = 15,806

$\mu_y = 72.14\%$

Fnr_{b,y} = 81.83%

NCV_{biomass} = 0.0156

EF_{projectedfossilfuel} = 63.70

Leakage_{adj} = 0.95

ER_y = $3.43 \times 14,033 \times 70.17\% \times 81.83\% \times 0.0156 \times 63.70 \times 0.95 = 25,405$

For Batch 4

By,savings,i,j = 3.38

Ny,ij = 47,339

$\mu_y = 98.15\%$

Fnr_{b,y} = 81.83 %

NCV_{biomass} = 0.0156

EF_{projectedfossilfuel} = 63.70

Leakage_{adj} = 0.95

ER_y = $3.37 \times 47,339 \times 98.15\% \times 81.83\% \times 0.0156 \times 63.70 \times 0.95 = 120,872$

All the values have been verified by the verification team for the calculation of ER by cross verifying the values with the calculation presented in the ER calculation sheet/4/.

Table – Total ER during current Monitoring Period

Batch	ER _y (tCO ₂ e)
Batch 1	74,759
Batch 2	165,773
Batch 3	98,877
Batch 4	120,872
Total	458,281

Project Emissions:

As per the applied methodology, the P_{Ey} are considered to be 0.

Leakage Emissions:

Leakage shall be considered as default 0.95 in accordance with para 41 of the approved methodology. Further leakage emissions can occur due to switching from baseline device using firewood to efficient project device using charcoal. These emissions are calculated by using a default value of 0.030 t CH₄/t charcoal in accordance with “AMS-III.BG.: Emission reduction through sustainable charcoal production and consumption”.

VVB confirmed that these emissions are not accounted for during this monitoring period, as no beneficiary declared a fuel switch. The end-users monitored all declared using firewood during the MP, which is the baseline fuel

Emission reductions for the current monitoring period:

Year	Baseline emissions or removals (tCO ₂ e)	Project emissions or removals (tCO ₂ e)	Leakage emissions (tCO ₂ e)	Net GHG emission reductions or removals (tCO ₂ e)
01/04/2022-31/12/2022	458,281	0	0	458,281

4.5 Quality of Evidence to Determine GHG Emission Reductions and Removals

The assessment team confirms that the calculation and data is authentic. The quality of supporting documents submitted for verification are adequate. The assessment team has checked the quality and maintenance of the supporting documents during the onsite visit to confirm the authenticity of the documents and to check the appropriate calculations. The assessment team confirms that the proper evidence is available for the entire monitoring period and the same is verifiable and the data collection system meets the requirement of the monitoring plan and the applied methodology according to the assessment carried out.

The assessment team confirms the quality of evidence to determine the GHG reductions are satisfactory and the detailed information regarding the roles and responsibilities have been provided in the monitoring report.

4.6 Non-Permanence Risk Analysis

Not applicable for the project activity.

5 VERIFICATION OPINION

Earthood Services Private Limited (Earthood) was contracted by AERA group SAS and has performed the independent verification of the emission reductions for the VCS project activity (VCS ID- 2828) “Improved Cooking Stove Programme in Burundi” for the monitoring period 01/04/2022 to 31/12/2022 as reported in MR version 1.8 dated 23/07/2024.

It is our responsibility to express an independent verification statement on the reported GHG emission reductions from the project activity. Earthood commenced the verification based on the baseline, monitoring methodology AMS-II.G v10. and, the monitoring plan mentioned in the registered VCS PD MR.

Earthood’s verification approach is based on the understanding of the risks associated with reporting of GHG emission data and the controls in place to mitigate these. Earthood planned and performed the verification by obtaining evidence and other information and explanations that Earthood considered necessary to give reasonable assurance that reported GHG emission reductions are fairly stated.

In our opinion the GHG emission reductions reported for the project activity for the period 01/04/2022 to 31/12/2022 are fairly stated in the Monitoring report version 1.8 dated 23/07/2024. The GHG emission reductions were calculated correctly on the basis of the approved baseline and monitoring methodology AMS-II.G v10 and the VCS standard version 4.5 and ISO 14064-3.

Verification period: From 01-April-2022 to 31-December-2022

Verified GHG emission reductions and removals in the above verification period, broken down by calendar year:

Year	Baseline emissions or removals (tCO ₂ e)	Project emissions or removals (tCO ₂ e)	Leakage emissions (tCO ₂ e)	Net GHG emission reductions or removals (tCO ₂ e)
01/04/2022–31/12/2022	458,281	0	0	458,281
Total	458,281	0	0	458,281

Year	Ex-ante emissions reductions /removals	Achieved emissions reductions /removals	Percent difference	Justification for the difference
01/01/2022 – 31/12/2022	598, 395	458,281	21%	Less usage of the ICS distributed during this monitoring period as compared to ex-ante scenario of full use equivalent for 12 months have led to the decrease in the emission reduction.

Approved by



Dr.Kaviraj Singh

Managing Director

Earthood Services Private Limited

Date:02/08/2024

Place: Gurugram, Haryana

APPENDIX 1: DOCUMENT REFERENCES

S. No.	Title of Document	Version	Provider
1.	Registered VCS Joint PD&MR v1.8	v1.8 dated 29/11/2022	PP
2.	Initial Monitoring report	V1.0 dated 30/07/2023	PP
3.	Final Monitoring report	V1.8 dated 23/07/2024	PP
4.	Emission Reduction Calculation Sheet	V1.8 dated 23/07/2024	PP
5.	Registered VCS Joint Validation-Verification Report	V2.0,dated10/12/2022	PP
6.	VCS Standard	V4.5	Other
7.	VCS Program Guide	V4.4	Other
8.	Approved methodology AMS-II.G: Energy efficiency measures in thermal applications of non-renewable biomass	V10	Other
9.	Onsite visit records and interviews conducted by assessment team	08/08/2023	Other
10	Monitoring survey results for MP 5	-	PP
11	Sampling and surveys for CDM project activities and programmes of activities https://cdm.unfccc.int/sunsetcms/storage/contents/stored-file-20210531160756223/Meth_Stan05.pdf	09.0 EB50, A30	Other
12	Project Database	-	PP
13	WBT report	-	CRUEA
14	CDM Webpage of grouped project- PoA 10474: Improved Cooking Stove Programme in Burundi supported by Republic of Korea https://cdm.unfccc.int/ProgrammeOfActivities/poa_db/U2ZYTf1EWXPBHK0069GCLNSDRIQ78A/view	-	Other
15	VCS Webpage of grouped project- Improved Cooking Stove Programme in Burundi https://registry.terra.org/app/projectDetail/VCS/2828	-	Other
16	Local stakeholder consultation evidence - OBEN PV LSC minutes - Attendee List	-	Other
17	Grievance redressal register	-	PP

18	OBEN Service Mandate	-	PP
20	Agreement between AERA GROUP SAS and OBEN for transfer of credits	Dated 11/12/2018	PP
21	Joint Agreement for ICS Dissemination and GHG mitigation CDM Project in Burundi between AERA Group SAS and ECOEYE CO., LTD.	Dated 15/11/2018	PP
22	1 st Addendum to the Joint Agreement for ICS Dissemination and GHG mitigation CDM Project in Burundi	Dated 30/04/2019	PP
23	ICS Sales Agreements	-	PP
24	Summary of Expenditures November 2018-October 2021	-	PP
25	Registered CDM PoA-DD https://cdm.unfccc.int/ProgrammeOfActivities/poa_db/U2ZYTf1EWXPBHK0069GCLNSDRIO78A/view	-	Other
26	https://2012-2017.usaid.gov/documents/1866/2008-burundi-population-census-status-and-structure-population	-	Other
27	CDM registered CPA https://cdm.unfccc.int/ProgrammeOfActivities/cpa_db/R5MF4X6GWEJY8CVS9317ADKB2NUHTP/view	-	Other
28	IPCC Guidelines for National Greenhouse Gas Inventories.	-	Other

APPENDIX 2: ABBREVIATIONS

Abbreviations	Full texts
BEF	Baseline Emission Factor
CO ₂	Carbon dioxide
CDM	Clean Development Mechanism
CDPE	Centre Diocésain pour la Protection de l'Environnement
CMS	Central Monitoring System
CL	Clarification Request
CMP	Conference of Parties Serving as Meeting of Parties

CRUEA	Centre de Recherche Universitaire sur les Energies Alternatives
CAR	Corrective Action Request
EB	Executive Board
FAR	Forward Action Request
GHG	Green House Gas
ICS	Improved cookstoves
MR	Monitoring Report
O&M	Operation and Maintenance
PD	Project Description
PP	Project Proponent
SFR	Stakeholder Feedback Round
QA/QC	Quality Assurance and Quality Control
UNFCCC	United Nations Framework Convention on Climate Change
VCS PD	VCS Project Description
VCS	Verified Carbon Standard
VCSA	Verified Carbon Standard Association
VCUs	Verified Carbon Units
WBT	Water Boiling Test

APPENDIX 3: FINDINGS OVERVIEW

Table 1. CL from this verification

CL ID	01	Section no.	1.11	Date : 20/10/2023
Description of CL				
Issue – i. Table 1 titled, “Impact on Sustainable Development Goals in Burundi” under section 1.11, “Sustainable Development Contributions” lists 5 SDGs being claimed by the project activity. However, the table does not provide information on the specific targets being achieved by the Sustainable Development Goals. ii. The current project contributions listed in Table 1 state that 100% of the end users surveyed during the monitoring period experienced money savings and 97% of the end-users surveyed experience less fumes when cooking with the ICS distributed. However, the ER sheet, tab “Monitoring Surveys MP5” does not provide any calculation to confirm the stated percentages. iii. The current project contributions listed for SDG 7 in table 1 is 1,237 households being equipped with ICS. Moreover, contributions over Project Lifetime have been listed as 204,093 households equipped with ICS. However, as per the ER sheet, tab “Project Database” the number of cookstoves (batch 1, batch 2, batch 3 and batch 4) distributed during the current monitoring period are calculated as 2,90,050, given by cell P13. The value of current project contributions for SDG7 reported in the MR cannot be substantiated from the ER sheet. iv. The contributions over project lifetime of SDG 8 listed in the table are “the project is expected to create 30 jobs during its lifetime”. However, there is no estimated figures and supportive evidence are given in the ER sheet to verify the statement. Action item – i. PP shall provide clarification on each SDG being claimed by the project activity by listing the specific SDG indicator against the SDG Target for the project activity. (https://unstats.un.org/sdgs/metadata/) ii. PP shall provide clarification on the reported percentages of end-users and demonstrate the calculation in the ER sheet for VVB’s reference. iii. PP shall provide clarification on the number of cookstoves that are distributed during the current monitoring period along with the number of cookstoves distributed over the project’s lifetime and report them accurately in the MR and ER sheet. iv. PP shall clarify why SDG 8 is being claimed for the current monitoring period since no new jobs have been created during the specified time period. PP shall also provide evidence Program rule – NA				
Project participant response				Date : 15/11/2023
1) Clarifications on each SDGs have now been provided. 2) The percentages are now clearly indicated in cells A166, A167 and A168 of the Monitoring surveys tab of the ER sheet 3) Number of cookstoves distributed since project start is 290,050 and number of ICS distributed during this monitoring period is 10,438 as per cells P13 and O6 of the project database tab of the ER sheet. MR have been corrected accordingly. 4) Although no new jobs was created during this MP, VVB to remember that the jobs created since project start are still applicable during this MP. Decent jobs have been created and workers are still working for the project.				
Documentation provided by project participant				

Revised ER sheet	
Revised MR	
VVB assessment	Date: 24/11/2023
i.	The revised MR was assessed by the verification team and it was found that Table 1 titled, “Impact on Sustainable Development Goals in Burundi” now includes information on the specific targets being claimed by SDGs. CLOSED
ii.	The contributions over project lifetime for SDG 3 are mentioned as “97% of the end-users experience less fumes during the overall project”. However, the ER sheet, tab “Monitoring Surveys MP5” still does not demonstrate the calculation of how 97% is achieved. PP is requested to provide traceable calculation/ justification to verify the figure. OPEN
iii.	The number of cookstoves distributed during the current monitoring period i.e, 10,438 and the number of cookstoves distributed in the project activity since the start of the crediting period i.e, 290,050 have now been correctly listed under table 1, “ Sustainable Development Contributions” against SDG 7. CLOSED
iv.	Since it has been stated in the MR under contributions over project lifetime for SDG 8 that “ the project created 30 jobs during its lifetime”, PP has provided the list of people employed to verify the figure that has been reported as evidence to substantiate that employment has been created as part of the project activity. CLOSED
CL 01 is open	
Project participant response	Date : 15/01/2024
Corrected, for Current MP, it is 100% of end-users experiencing less fumes as per ER sheet, tab “Monitoring Surveys MP5”, cell AC158. And it is 99% for the whole project lifetime contribution as it corresponds to the mean value between verification 4 & verification 5.	
Documentation provided by project participant	
Revised MR	
VVB assessment	Date: 17/02/2024
the contributions over project lifetime for SDG 3 have been updated to 100% in the revised MR which can be confirmed from the monitoring survey sheet provided to the VVB. Therefore, the finding is closed.	
CL 01 is closed.	

CL ID	02	Section no.	4.2	Date : 20/10/2023
Description of CL				
Issue -				
i.	Section 4.2, “Data and parameters Monitored” lists NCV Biomass as well as Lifespan as parameters to be monitored during the current monitoring period. However, NCV biomass which refers to the net calorific value of non -renewable woody biomass used in project devices and the lifespan are ex-ante parameters fixed at the time of validation as per the applied methodology, AMS-II.G. v.10. PP shall provide clarification on why these parameters are listed as parameters to be monitored.			
ii.	The table for parameter “Life span” mentions the value applied as N/A and justifies it as “Only reported if option (a) of para. 32 of AMS-II.G is chosen. However, as per the applied methodology, the life span of each of each type of the project devices is requested to be documented based on the manufacturer’s specification.			

Action Item –

- i. PP shall provide clarification on why the parameters NCV Biomass and Lifespan are listed as parameters to be monitored.
- ii. PP shall report the lifespan of the ICS as per the manufacturer/ technical specification document. PP shall also account for the loss in efficiency of the project devices i in each batch j due to aging of the device during the monitoring period y. PP shall select one of the 4 options mentioned in paragraph 32 of the applied methodology and specify how the loss in efficiency in is being accounted for.

Program rule - AMS-II.G: Energy efficiency measures in thermal application of non-renewable biomass v.10.

Project participant response
Date : 15/11/2023

- 1) VVB to kindly note that those parameters were validated in monitored parameters during project validation under GS. However, following VVB comments NCV has been moved to fixed parameters, and lifespan removed as project is conducting WBTs on an annual basis and didn't opt for decrease in efficiency.
- 2) As stated above, the project is conduction WBTs at each monitoring period and didn't opt for loss in efficiency option. Hence the parameter is not meant to be monitored. The lifespan of the ICS is 8 years as validated under CDM and during validation under VCS.

Documentation provided by project participant

Revised MR

VVB assessment
Date: 24/11/2023

- i. Since NCV biomass is the net calorific value of non-renewable woody biomass used in the project devices fixed as an ex ante parameter at the time of validation, it has been listed under parameters fixed ex ante in the MR. **CLOSED**
- ii. It is understood that since WBTs are conducted at each monitoring period and has not opted for the loss in efficiency option as per paragraph 32 of the applied methodology and therefore the loss in efficiency is not accounted for in the current verification. Therefore the parameter lifespan is no longer listed as a monitored parameter. **CLOSED**

CL 02 is closed.

CL ID	03	Section no.	ER sheet	Date : 20/10/2023
Description of CL				
Issue – In the ER sheet, tab “VCUs calculation”, the percentage of operational stoves (Pop-Stove) has been multiplied in the emission reduction calculation for batch 4 (cell C57). However, the parameter has not been multiplied in the Emission Reduction calculations for Batch 1 (cell C33), Batch 2 (cell C38) and Batch 3 (cell C53). Action Item - PP is requested to provide clarification on the equation applied and further address the inconsistency. Program rule - NA				
Project participant response				Date : 15/11/2023

1) The ER calculation of Batch 4 should not account again for Pop stove parameter as this is already taken into consideration in Nyi (number of operational stoves) that is obtained by multiplying number of stoves (N) by Pop. The Pop stove used in batch 4 calculation have therefore been removed. Calculation for other batches are found to be correct.	
Documentation provided by project participant	
Revised ER sheet	
VVB assessment	Date: 24/11/2023
The revised ER sheet was assessed by the verification team and it can be confirmed that the multiplication of the parameter (Pop-stove) has been removed from the Emission reduction calculation of Batch 4 as it is already taken into consideration by parameter Nyi. The ER calculation of all 4 batches is now consistent and appropriate. Therefore, the finding is closed.	
CL 03 is closed.	

Table 2.CAR from this verification

CAR ID	01	Section no.	1.1	Date : 20/10/2023
Description of CAR				
Issue – i. Sub-section 1.1, “Summary Description of the Implementation Status of the Project” under section 1, “Project Details” does not enlist all details pertaining to the project description in accordance with the guidelines presented in the VCS Monitoring Report Template v.4.2. ii. The section states that the number of cookstoves distributed during the current monitoring period 01-April-2022 to 31-December-2022 are 204,093. However, this figure is found inconsistent from the Emission Reduction, tab “Project Database”, cell P13 which mentions the number of cookstoves distributed as 2,90,050. Action item – i. PP is requested to include information on the following in section 1.1 of the MR – • Summary description of the implementation status of the technologies/ measures included in the project. • Relevant implementation dates for e.g., dates of construction, commissioning and continued operation periods. ii. PP shall address the inconsistency between the reported amount of distributed cookstoves during the current monitoring period between the MR and the ER sheet. Program rule – VCS Monitoring Report Template v.4.2.				
Project participant response				Date : 15/11/2023
1) The section 1.1 of the MR has been revised to include implementation status and relevant implementation dates. 2) VVB to kindly note that 290,050 refers to total number of stoves distributed since project start. The number of ICS distributed during this MP is 10,438 as per cell 06 of the Database Tab of ER sheet. Same is now corrected in MR				
Documentation provided by project participant				
Revised MR				

WB assessment		Date: 24/11/2023
i.	Subsection 1.1, “Summary Description of the Implementation Status of the Project” in the revised MR still does not list a summary description of the ICS (type, technical specifications etc) as per the registered CDM PoA- DD. PP shall include all relevant details in the MR. OPEN	
ii.	The revised documents were assessed by the verification team and it can be confirmed that the inconsistencies regarding the number of cookstoves distributed during the current monitoring period and the entire crediting period have been rectified. CLOSED	
CAR 01 is open		
Project participant response		Date : 15/01/2024
Characteristics of the ICS have been added		
Documentation provided by project participant		
Revised MR		
WB assessment		Date: 17/02/2024
The revised document was assessed by the verification team and it can be confirmed that all relevant details regarding the ICS type, technical specifications as per the registered CDM PoA-DD have been included in section 1.1 of the MR. therefore, the finding is closed.		
CAR 01 is closed.		

CAR ID	02	Section no.	1.8 , 4.3	Date : 20/10/2023
Description of CAR				
Issue –				
1. Section 1.8, “Title and Reference of Methodology” states that the section is not applicable as the project activity is a CDM registered GHG program, under CDM-PoA 10474. Thus, the section details are not in accordance with the VCS Monitoring Report Template v.4.2. 2. Section 4.3, “Monitoring Plan of the MR” states that “this section is not applicable project activity is a CDM registered GHG program, under CDM- PoA 10474. Thus, section 3.20.5 of the VCS Standard v4.2 has been referred.”				
Action Item –				
a. PP shall provide the title, reference and version number of the methodology applied to the project along with the title and version number of any applied tools. b. As per the VCS Monitoring Template Guidelines v.4.2., PP shall describe the process and schedule followed for monitoring the data and parameters, set out in section 4.2 (Data and Parameters Monitored). PP shall include information on the following in the monitoring report: i. The organization structure, responsibilities and competencies of the personnel that carried out the monitoring activities. ii. The methods used for generating / measuring, recording, storing, aggregating, collating and reporting the data on monitored parameters. iii. The procedures used for handling any internal auditing performed and any non conformity identified. iv. The implementation of sampling approaches, including target precision levels, sample sizes, sample site locations, stratification, frequency of measurement and QA/QC procedures.				

v. Wherever applicable, PP shall demonstrate whether the required confidence level or precision has been met.	
Program rule – VCS Monitoring Report Template v.4.2.	
Project participant response	Date : 15/11/2023
Sections 1.8 and 4.3 of the Monitoring report have been revised to include all the necessary informations.	
Documentation provided by project participant	
Revised MR	
VVB assessment	Date: 24/11/2023
i. The revised MR was assessed by the verification team and it is found that the title, reference and version number of the methodology applied to the project along with the title and version of applied tools have been incorporated in the MR. CLOSED ii. Section 4.2 of the revised MR was assessed by the verification team and it is found that all necessary information regarding the monitoring plan has been added. However, PD is requested to provide kobo Toolbox data (sample pictures of end user agreements, GPS coordinates, filled monitoring survey questionnaires and end-users monitored) for the current monitoring period as specified under the same section of the MR. The monitoring plan provides information regarding the sampling method adopted by the PP. The following discrepancies are observed: - The equation given for calculating the sample size for average efficiency of cookstoves corresponds to stratified random sampling as per equation (4), paragraph 24 of the Guideline: Sampling and Surveys for CDM Project Activities and Programme of Activities, as opposed to “Simple random sampling, Appendix 1, para 51” mentioned in the MR. PP shall provide clarification on the sampling technique applied and further take corrective action for the calculation of sample sizes. - The section lists “Table 1: Calculation of sample size of proportions (95/10 confidence/ precision). PP shall clarify why a 95% confidence level has been selected for the parameter Pop household,y and 1-Uy since the same section of the MR states that “ An annual inspection has been conducted for this monitoring period, the sample size has been calculated to obtain 90/10 confidence precision”. - PP is also requested to demonstrate in the MR, the calculation method for the determination of sample size of all monitored parameters and how a sample size of 154 households was achieved. PP shall also include in the MR, a summary of the results of monitoring surveys for each parameter. - The section states that “ the z-value depends on the level of confidence. For 90% it is 1.65 as per para 116 of the Guideline: Sampling and surveys for CDM project activities and PoAs”. However, PP is requested to kindly rectify the paragraph number since para 116 of the Guideline corresponds to a sample equation for the sample size required under simple random sampling. OPEN	
CAR 02 is open	
Project participant response	Date : 15/01/2024
Corrected, the z-value is precised in para 28 of the “ Guideline: Sampling and surveys for CDM project activities and PoAs”	
Documentation provided by project participant	
Revised MR	
VVB assessment	Date: 17/02/2024

PP is requested to provide an appropriate response to each point in the “project participant response” section. The justification provided for all the comments has not been found satisfactory.

Hence the CAR#02 is open

Project participant response

Date : 21/02/2024.

The appropriate response to each point has been added below:

- Please see para 51 of section 2.1.7 of the Guideline: Sampling and surveys for CDM project Activities and Programme of Activities, which mention the equation to be used to calculate the sample size for simple random sampling, as below:

2.1.7. Example 6 – Simple random sampling

50. For simple random sampling to be appropriate we are assuming that CFL usage is homogeneous amongst the households.

51. The following equation can be used to calculate the sample size:

$$n \geq \frac{1.645^2 \cdot N \cdot V}{(N-1) \times 0.1^2 + 1.645^2 \cdot V} \quad \text{Equation (18)}$$

- The level of confidence has been corrected to 90/10
- Clarification on the sampling technique and results have been added to the revised MR (see final total sample sizes determination table) as well as ER sheet (tab sample size calculation).
- Corrected, the z-value is precised in para 28 of the “ Guideline: Sampling and surveys for CDM project activities and PoAs”

Documentation provided by project participant

Revised ER sheet.

VVB assessment

Date : 23/02/2024

VVB found that all the comments has been addressed satisfactorily by the PP. All four discrepancies were clearly addressed by the PP and hence the comment is closed.

CAR#02 is closed.

CAR ID	03	Section no.	2.2 & 4.1	Date : 20/10/2023
Description of CAR				

Issue –

- i. Section 2.2, “Local Stakeholder Consultation” of the MR states that “Please refer to sections F of PoA-DD of the UNFCCC registered CDM project with reference no. 10474. However, this is not in accordance with the details to be filled in the section as per the guidelines provided in the VCS Monitoring Report Template guidelines.
- ii. Section 4.1, “Data and Parameters Available at Validation” states that “This section is not applicable as project activity is a CDM registered GHG program, under CDM- PoA 10474” However, this is not in line with the guidelines given in the VCS Monitoring Report Template, v4.2 and the parameters fixed ex ante in accordance with the applied methodology, AMS-II.G v.10.

Action Item –

- i. PP shall describe in the monitoring report, the process for, and the outcomes from ongoing communication with local stakeholders conducted prior to verification and provide information on the following-
 - The procedures or methods used for engaging local stakeholders (eg., dates of announcements or meetings, periods during which input was sought).
 - The procedures or methods used for documenting the outcomes of the local stakeholder communication.
 - The mechanism for on-going communication with local stakeholders.
 - How due account of all and any input received during ongoing communication has been taken along with details on any updates to the project design.
- ii. PP shall list all the data and parameters determined at validation and remained fixed throughout the project crediting period using the tables provided in the VCS Monitoring Report Template and the applied methodology, AMS-II.G : Energy efficiency measures in thermal application of non-renewable biomass v.10.

Program rule – VCS Monitoring Report Template v4.2, AMS-II.G: Energy efficiency measures in thermal application of non-renewable biomass v.10.

Project participant response
Date : 15/11/2023

- 1) Local stakeholder consultation report outcomes is now included in the monitoring report
- 2) PP revised all the ex-ante and monitored parameters to ensure consistency with the methodology

Documentation provided by project participant

Revised MR

VVB assessment
Date: 24/11/2023

- i. The revised MR was assessed by the verification team and it is found that relevant information regarding the local stakeholder consultation meeting has been included in the section 2.2 However, PP is requested to include details in the MR and elaborate on the continuous ongoing grievance mechanism in place for the local stakeholders/ end-users to communicate their concerns to the PP. **OPEN**
- ii. Under section 4.1, “Data and parameters available at validation”;
 - For parameter Np,HH, the reference link in the footnote (7) for the substantiation of its value is found to be not reachable. Thus the value applied cannot be verified. PP shall provide a working link.
 - For parameter fNRB,y, as per tool 30, “In case of ex-ante calculation of fNRB, the parameter shall be estimated using the most recent historical year for which data is available. Therefore, PP shall state exact source for the determination of the value of fNRB in the MR and also provide a link for its substantiation. **OPEN**

CAR 03 is open

Project participant response	Date : 15/01/2024
Details on the continuous mechanism for ongoing communication has been added. The Ex-Ante ER sheet link containing details on the calculation of fnrb has been added	
Documentation provided by project participant	
Revised MR Ex-ante calculation sheet	
VVB assessment	Date: 17/02/2024
i. The revised document was assessed by the verification team and it can be confirmed that relevant information regarding the ongoing grievance mechanism has been included along with the supportive documentation. CLOSED ii. For the parameter fNRB, PP has stated the source for determination of the value and link containing calculation details has been included. CLOSED	
CAR 03 is closed.	

CAR ID	04	Section no.	4.2	Date : 20/10/2023
Description of CAR				
Issue –				
i. Section 4.2, “Data and Parameters Monitored” lists the monitored parameters of the current monitoring period. However the parameter tables are not consistent with the VCS Monitoring Report Template v4.2. ii. The value of Ny,i,j for Batch 2 is mentioned to be 68,865 as per the table provided in the Monitoring Report. However, ER sheet tab “VCUs Calculation”, cell O38 mentions the value to be 65,916. iii. The value Ny,i,j for batch 3 is mentioned to be 59,857 in the MR. However, the sum of Ny,i,j values of ICS in batch 3 corresponding to ECOEYE and POWA is found to be 60,274, calculated by addition of cells O47 and O52 in tab “VCUs Calculation”. iv. The value of Ny,i,j is mentioned as 47,181 in the MR. However, the value of the parameter as per the ER sheet, tab VCUs calculation, cell O57 is given as 47,339. v. The parameter values for μ_y reported in the MR are 95.76%, 98.65%, 72.14% and 98.15% for Batch 1, Batch 2, Batch 3 and Batch 4 respectively. However these values correspond to 1- μ_y as calculated in the ER sheet tab, “VCUs calculation” vi. The value applied for parameter “N” in the MR is found to be 204,093 cookstoves full use equivalent. However, the number of stoves full use equivalent as per the ER sheet, tab “Project Database”, cell Q13 is mentioned to be 2,17,948.				
Action Item –				
i. PP shall adhere to the format of the tables provided in the VCS Monitoring Report Template v4.2 and fill in each column for every listed parameter. ii. PP is requested to address all inconsistencies specified				
Program rule – VCS Monitoring Report Template v.4.2.				
Project participant response				Date : 15/11/2023
1)Parameters tables have been revised to be consistent with version 4.2 if the monitoring report template.				

- 2)Value of Ny,i,j has been corrected in MR
- 3)VVB is correct same has been modified in MR sheet
- 4)MR has been modified.
- 5)VVB is right values are for 1-uy. Value in MR have been corrected.
- 6)Value of N in MR have been corrected

Documentation provided by project participant

Revised MR

VVB assessment

Date: 24/11/2023

The revised MR was assessed by the verification team and it can be confirmed that values of all parameters across the MR have been made consistent with the ER sheet. However, the value of parameter Ny,ij for Batch 3 is updated to 59,274. However, the sum of Ny,ij values of ICS in batch 3 corresponding to ECOEYE and POWA is found to be 60,274, calculated by addition of cells O47 and O52 of the ER sheet tab "VCUs Calculation". PP shall take corrective action.

CAR 04 is open

Project participant response

Date : 15/01/2024

Corrected

Documentation provided by project participant

Revised MR

VVB assessment

Date: 17/02/2024

The revised MR was assessed by the verification team and it is found that the values of parameter Ny,i,j for batch 3 have been rectified. Thus, the finding is closed.

CAR 04 is closed.

CAR ID	05	Section no.	5	Date : 20/10/2023
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Description of CAR

Issue –

- i. The value of Pop-Stove for Batch reported in the MR is 95.26%. However, the value of the parameter given in the ER sheet as per tab “VCUs calculation”, cell N57 is found to be 95.56%.
- ii. The value of By,savings for Batch 3 mentioned in the MR is 3.34 tonnes/ year.. However, the value of the parameter reported in the ER sheet, tab “VCUs calculation”, cell G52 is 3.43 tonnes/year.
- iii. The value of Emission reductions for batch 2 mentioned in the MR is found to be 170,237 tCO₂. However, the value of ERy for batch 2 reported in the ER sheet, tab “VCUs Calculation”, cell C38 is mentioned as 1,70,443 tCO₂.
- iv. The value of ERy for batch 3 in the MR is found to be 113,505 tCO₂ However, the value of ERy for batch 3 as reported in the ER sheet, tab “VCUs calculation”, cell C53 is 115,332. tCO₂

Action Item – PP shall make all the values listed above consistent between the MR and ER sheet.

Program rule – VCS Monitoring Report Template v.4.2.

Project participant response
Date : 15/11/2023

- 1) Value in MR is found to be consistent with ER. VVB to kindly review again.
- 2) Value of By Savings have been revised in MR.
- 3) Value of ER of batch 2 have been revised in MR.
- 4) Value of ER for batch 3 have been corrected in MR

Documentation provided by project participant

Revised MR

VVB assessment
Date: 24/11/2023

The revised MR was assessed by the verification team and it can be confirmed that all values across the MR have been made consistent with the ER sheet. Thus, the finding is closed.

CAR 05 is closed.

CAR ID	06	Section no.	-	Date : 19/02/2024
Description of CAR				
Issue – Please address the following TR comments received: a. Verification team noticed that SDG 1 was not demonstrated during the joint validation and verification of the PA. The same is not established in the JPD-MR v.1.8 dated 29/11/2022. PP is requested to clarify and give a proper justification for the same. Please check and address the comments in the MR listed in Table 1 and section 1.11 of the MR. b. For the parameter Number of project devices distributed per household, the value monitored is 1, There was 1 end user observed in the ER sheet tab “Monitoring Survey MP5” cell no. 153. PP is requested to clarify how the requirement of 2 stoves was identified by the PP and how only the reported UID considered out of the two ICS. Action Item – PP shall make all the values listed above consistent between the MR and ER sheet and also address the comments listed in the MR. Program rule – VCS Monitoring Report Template v.4.2.				
Project participant response				Date: 21/02/2024

a) VVB to note that although the SDG 1 was not included during joint validation and verification, with only 4 SDGs, included at that time, the SDG 1 is still applicable to this project reductions in fuel purchases leads to money savings to the households. As per the monitoring surveys this question is asked to beneficiaries. VVB to note also that per our understanding nothing prevent PP from adding a new SDG. b) NdHH is now fully assessed in the database and in the Monitoring surveys. The most conservative value (1.03 from Database cross-check) have been used for calculation.	
Documentation provided by project participant	
<i>Revised MR</i> <i>Revised ER sheet.</i>	
VVB assessment	Date: 23/02/2024
a. VVB found that the justification of SDGs been added to the project activity is appropriately mentioned by thw PP as the PP wants to monitor SDG1 in the present verification and the SDG 1 is still applicable to this project reductions in fuel purchases leads to money savings to the households. As per the monitoring surveys this question is asked to beneficiaries. b. PP clarifies that the value of NdHH is considered as only 1 for each house and after the reassessment of the database and from monitoring survey, the most conservative value has been applied for the calculation .i.e., 1.03. Both the comment has been addressed satisfactorily and hence the CAR#06 has been closed.	

CAR ID	07	Section no.	-	Date : 25/06/2024
Description of CAR				

Issue – Please address the following resubmission TR comments received:

- a. As per comment 1(4) in the Project review report, Verra requires the PP to clarify the value of Nd.HH as In ERR sheet, (Project database, column K), the value of Nd,HH is reported as 0.1,0.2,0.5 etc. During the verification site visit, VVB has verified that only one cooking stove per household is registered in the electronic database, however, the value of Nd,HH is taken as 1.03, which is unclear. The ER calculations viz. Nd, HH is not clearly described, in order to allow a third party to replicate the calculations. PP is requested to further described and explained the calculations are needed to be as per the comment and clarify the actual value applied for the parameter.
- b. As per comment 2(1) in the Project review report, PP is requested to justify the reasons for the consistently higher ICS efficiency during the monitoring period.
- c. 1) As per comment 2(3) in the Project review report, PP is requested to justify why PP has not followed sampling and surveys for CDM project activities and programmes of activities guidelines, in particular para 108, which states, "The process should be iterated until there is no change to the value of n.

2)PP mentions that the methodology applied allows the PP to conduct a WBTs on 3 stoves (3 test per stove). According to applied methodology, this simplified approach may be used, only when the efficient cookstoves are produced by a manufacturer with a good quality management system in place to ensure that the individual equipment produced do not vary beyond the range of acceptance limits (e.g. characteristics such as materials, critical dimensions). How does the PP stove manufacturing meet these criteria?
- d. As per comment 4(4) in the Project review report, "The firewood/Charcoal conversation factor is not considered per CDM TOOL 33. GWP is not considered per AR5 for vintages after 2021, as per section 3.15.4 of VCS standard v 4.5". PP is requested to clarify why the firewood/charcoal conversion factor is not applied in accordance with para 30 of AMS.II-G ver 10. Further the GWP value is not included in line with section 3.15.4 of the VCS standard v4.5.

Project participant response

Date: 26/06/2024

a) Explanation of Nd,HH Calculations in the ERR Sheet (Project Database, Column K)

The column previously labeled as "Check Nd'HH" has been renamed to "Unique Household Occurrences" to more accurately reflect its purpose. This column is used to calculate the unique count of entries in the dataset, where each entry is a combination of the household's name, address, and other relevant details. The value in this column is calculated using the formula $=\text{SOMME}(1/\text{NB.SI}(\text{J:J};@J:J))$. The formula works as follows: $\text{NB.SI}(\text{J:J}, @J:J)$ counts how many times each entry appears in column J, which is the concatenated column of household identifiers. The reciprocal $1/\text{NB.SI}(\text{J:J}, @J:J)$ is then taken to ensure that each occurrence contributes proportionally ($1/n$) to the sum. The SOMME function sums these reciprocals, resulting in a unique count of households. For instance, if an entry appears 3 times, each occurrence contributes $1/3$ to the sum, and summing $1/3 + 1/3 + 1/3$ gives 1, counting the unique entry once. This ensures that even if a household appears multiple times, it is only counted once.

The values reported as 0.1, 0.2, 0.5, etc., in the "Unique Household Occurrences" column correspond to these calculations. The final Nd,HH value, calculated in cell O7, represents the mean number of occurrences of each unique entry. This mean is calculated using Total number of entries (total ICS distributed) / Sum of unique counts (sum of column K value). This method ensures accuracy in reporting the number of unique households, even if there are multiple records for some households, leading to a value of Nd,HH like 1.03. This approach guarantees clarity and replicability of ER calculations by third parties.

b) Justification for Higher ICS Efficiency During the Monitoring Period:

The efficiency of the new improved cookstoves (ICS) has been revised to 32.1% as per the CPA-DD. It is important to note that the efficiencies are decreasing over the years. For example, Batch 4, the most recent batch, has an efficiency of 32.4%, which is close to the new ICS thermal efficiency of 32.1%. This trend shows a continuous drop in efficiency with the age of the cookstove batch, the older the batch, the lower the efficiency. This indicates that the efficiency of the cookstoves naturally declines over time due to wear and usage, which is consistent with typical stove performance degradation patterns.

c) Justification for Not Following CDM Sampling and Survey Guidelines:

The applied methodology permits the Project Participant (PP) to conduct Water Boiling Tests (WBTs) on three stoves, performing three tests per stove. Although the precise CDM project activities sampling and survey guidelines were not strictly adhered to, specifically para 108 which requires iteration until there is no change to the value of n , the achieved results meet the required 90/10 precision standard. During the monitoring period, three stoves per batch were tested three times each, and the 90/10 precision was consistently achieved for all batches. This consistency and reliability in the testing approach confirm that the methodology applied is robust and meets the required precision levels.

The efficient cookstoves produced by OBEN are manufactured under good quality control measures. The following points highlight how OBEN ensures high-quality production:

- **Quality Management System:** OBEN's manufacturing process adheres to a rigorous quality management system. This system guarantees that all stoves produced within a batch do not vary beyond acceptable limits in terms of material properties and critical dimensions. The uniformity in production is maintained through strict quality checks and standard operating procedures.
- **Uniformity of Production:** The stoves are of the same type and are produced using identical materials and processes. This minimizes variations within each batch, ensuring high consistency and reliability of the stoves.

- **Historical Performance:** The performance of the stoves has been consistently validated in previous monitoring periods, including MP4 and the current period. All tests have consistently met the 90/10 precision standard, demonstrating a high level of uniformity and quality in the stoves produced.

While the testing process has not been iterated to five tests as mentioned in para 108 of the CDM guidelines, the results from the three-stove tests have been satisfactory and within the acceptable precision range. Achieving the 90/10 precision confirms the reliability and quality of the stoves produced by OBEN. This approach ensures that the stoves perform consistently well, meeting the necessary efficiency and quality standards

d) Firewood/Charcoal Conversion Factor :

The wood-to-charcoal conversion factor has been removed from the calculation because biomass consumption is directly assessed using wood consumption. Therefore, there is no need to convert charcoal to its wood equivalent. This approach aligns with our project methodology, which measures biomass consumption directly in terms of wood, making the conversion factor redundant.

Global Warming Potential (GWP) Value :

The GWP value has also been excluded from the calculation. Since GWP is not used in the current methodology for this project, it has been removed from the equation. This decision is in line with the guidelines provided in section 3.15.4 of the VCS standard v4.5, which specify the use of AR5 GWP values for vintages after 2021. However, since GWP does not play a role in our biomass consumption assessment, it has been removed.

Documentation provided by project participant

Revised ER sheet

VVB assessment

Date: 03/07/2024

- The assessment team can confirm that the column labelled “NdHH” has been renamed to “Unique Household Occurrences” for better clarity. The calculation has been explained by the PP in detail and the formulae are applied in the ER sheet in a way that is replicable by a 3rd party. **CLOSED.**
- The efficiency of the ICS has been revised and the trend shows a continuous drop with the age of the batch of cookstoves. This is now acceptable to the VVB. **CLOSED.**
1. VVB confirmed that since the applied methodology permits the Project Participant (PP) to conduct Water Boiling Tests (WBTs) on three stoves, performing three tests per stove. The consistency and reliability in the testing approach confirms that the methodology applied is robust and meets the required precision levels and PP is keeping the method inline with the applied methodology.
2. Since the produced stoves are of the same type and are produced using identical materials and processes. This minimizes variations within each batch, ensuring high consistency and reliability of the stoves. Further taking the fact into consideration that The performance of the stoves has been consistently validated in previous monitoring periods, including MP4 and the current period. VVB can accept the simplified approach used on the cookstove. Hence the comment is closed.
- The assessment team confirms that biomass consumption is directly assessed using wood consumption, thus , there is no need to convert charcoal to its wood equivalent.. The project adheres to the applied methodology. The GWP value has been removed from calculation since it is not included in the biomass consumption assessment. **CLOSED**

CAR 07 is Closed

APPENDIX 4: COMPETENCY STATEMENTS

Competence Statement			
Name	Vishnu S Panicker		
Education	M.Sc (Sustainable Development and Environment Management) B.Sc (Forestry)		
Experience	1+ years		
Field	Forestry and Environment		
Approved Roles			
Team Leader	Yes (VM)		
Validator	Yes (VM)		
Verifier	Yes (VM)		
Local expert	Yes (India)		
Financial Expert	NO		
Technical Reviewer	NO		
TA Expert (X.X)	Yes (VM TA 1.2, 3.1)		
Reviewed by	Shifali Guleria, Quality Manager	Date	09/06/2023
Approved by	Deepika Mahala, Technical Manager	Date	09/06/2023

Competence Statement			
Name	Mehr Munjal		
Education	B.Sc. (Hons) – Bio-chemistry M.Sc. – Biotechnology		
Experience			
Field	Biochemistry		
Approved Roles			
Team Leader	NO		
Validator	YES		
Verifier	YES		
Local expert	NO		
Financial Expert	NO		
Technical Reviewer	NO		
TA Expert (X.X)	NO		
Reviewed by	Shifali Guleria (Quality Manager)	Date	18/01/2024

Approved by	Deepika Mahala (Technical Manager)	Date	18/01/2024
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Competence Statement			
Name	Stanislas Niyonzima		
Education	DESS (Professional master) Planning and management of agricultural projects Bachelor's Degree (Rural economics) Design and management of rural development projects		
Experience	32+ years		
Field	Climate Change & Environment		
Approved Roles			
Team Leader	NO		
Validator	NO		
Verifier	NO		
Methodology Expert	NO		
Local expert	YES (Burundi)		
Financial Expert	NO		
Technical Reviewer	NO		
TA Expert (X.X)	NO		
Reviewed by	Shifali Guleria (Quality Manager)	Date	25/05/2022
Approved by	Deepika Mahala (Technical Manager)	Date	25/05/2022

Competence Statement	
Name	Shifali Guleria
Education	M.Sc. (Environmental Studies and Resource Management), TERI University
Experience	3+ year
Field	Climate Change
Approved Roles	
Team Leader	YES
Validator	YES
Verifier	YES
Methodology Expert	YES (AMS-I.A., AMS-II.G., AMS-II.E., AMS-III.A.V., AMS-I.D, ACM0002)
Local expert	YES

Financial Expert	NO		
Technical Reviewer	YES		
TA Expert	YES (1.2, 3.1)		
Reviewed by	Deepika Mahala	Date	18/02/2022
Approved by	Ashok Gautam	Date	18/02/2022